



JOLIET
JUNIOR COLLEGE
—1901—

Project Manual
for
Joliet Junior College,
Illinois Community College District No. 525
Joliet, Illinois

BID RELEASE 25

Site Landscape
Gilbane Project No. 4764-009

February 24, 2011

Volume 2 of 2

B.P. #

02N

Description:

Site Landscape Work

Owner:

Joliet Junior College,
Illinois Community College District No. 525
1215 Houbolt Road
Joliet, Illinois 60431-8938
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Chicago, IL 60661-2122
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Construction Manager:

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LEGATARCHITECTS

Gilbane

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SECTION 01 00 10

LEED COMPLIANCE

PART 1 - GENERAL

1.1 LEED COMPLIANCE

- A. Each Trade Contractor shall supervise all LEED related activities, perform the tasks specified, and maintain the Project on track to obtain the LEED credits specified. Credentials are to be submitted within fifteen (15) days of the issuance of the Notice to Proceed.
- B. The Trade Contractor shall furnish all submittals required by the specifications to the LEED consultant who is hired by the Architect of Record. The Architect of Record's LEED consultant shall serve as the contact for the U.S. Green Building Council with respect to this project.
- C. The Trade Contractor shall submit separate forms and information for the 5 separate LEED projects:
 - 1. Natural Science
 - 2. Automotive
 - 3. Campus Center
 - 4. Health Professions
 - 5. Facility Services
- D. Initial Tasks (Responsibilities as applicable per each Trade Contractor)
 - 1. Procure and incorporate waste management, recycled content and erosion and sedimentation control, and regional materials data from previous contractors who performed work on the site.
 - 2. Procure or prepare and submit Qualification Data as required for the Waste Management Coordinator before work begins.
 - 3. Prepare and submit the LEED Action Plan within thirty (30) days of the date of the Notice to Proceed.
 - 4. Prepare and submit the materials table within thirty (30) days of the date of the Notice to Proceed. Include information from previous related Bid Releases within the LEED boundary.
 - 5. Prepare and submit erosion and sediment control plan required in Specification Section 01 57 13 within fifteen (15) days of the Notice to Proceed. Include information from previous related Bid Releases within the LEED boundary.
 - 6. Prepare and submit the Construction Waste Management Plan within fifteen (15) days of the Notice to Proceed. Include information from previous Bid Releases within the LEED boundary.
 - 7. Prepare and submit a Volatile Organic Compound (VOC) emissions plan for paint required in Specification Section 01 61 16 within thirty (30) days of the Notice to Proceed.
 - 8. Prepare and submit Construction Indoor Air Quality plan required in Specification Section 01 57 21 within thirty (30) days of the Notice to Proceed.

- E. Ongoing Tasks (Responsibilities as applicable per each Trade Contractor)
1. Prepare and submit with each application for payment LEED progress report required in Specification Section 01 35 14.
 2. Procure and submit LEED Documentation submittals required in Specification Section 01 35 14 concurrent with Product Data, Shop Drawings, and LEED Submittals required of the various Technical Specification Section.
 3. Procure and submit Waste Reduction Progress Reports required by Specification Section 01 35 14 with each application for payment.
 4. Procure and submit recycling and processing facility records concurrently with each waste reduction progress report (concurrently with each application for payment).
 5. Procure and submit landfill and incinerator disposal records concurrently with each waste reduction progress report (concurrently with each application for payment).
 6. Prepare and submit records of donations and sales of salvageable waste if and when it occurs.
 7. Procure and submit construction documentation required in Specification Section 01 57 21 for indoor air quality management.
 8. Coordinate the activities of the General Contractor's Superintendent, Waste Management Coordinator, Mechanical System's Coordinator, and Commissioning Agent, relative to complying with LEED requirements and achieving the LEED Rating.
- F. Closeout Tasks (Responsibilities as applicable per each Trade Contractor)
1. Procure and submit waste reduction calculations before request for Substantial Completion.
 2. Prepare and submit LEED letter template for credit MR2.1 & MR2.2 to Architect of Record's LEED Consultant before request for Substantial Completion.
 3. Prepare and submit final Volatile Organic Compound (VOC) emissions documentation for paint as required in Specification Section 01 61 16 to Construction Manager before request for Substantial Completion.
 4. Provide any and all other documents required at any time by the U.S. Green Building Council to support the LEED application for this project.

END OF SECTION

LEED Tracking Spreadsheet Example

LEED MR4 Recycled Content Tracking Log

Spec. #	Description	Construction			
		Material Cost	Recycled Content		
			PostCons%	PreCons%	Value
07515	Flexible Sheet Roofing	\$128,150.00			\$1,557.00
07515	Flat Polyiso Insulation				\$0.00
07515	Cover Board	\$18,000.00	0.00%	0.00%	\$0.00
07515	Flex Flashing		0.00%	5.00%	\$0.00
07515	Flex Roofing Membrane	\$62,000.00	0.00%	5.00%	\$1,550.00
07515	Glass Fiber Type IV	\$3,800.00	0.00%	0.00%	\$0.00
07515	Glass Fiber Type VI	\$7,000.00	0.00%	0.00%	\$0.00
07515	Substrate Cover Board	\$350.00	0.00%	4.00%	\$7.00
07515	Tapered Polyiso Insulation				\$0.00
07515	Termination Bar				\$0.00
07515	Type III Asphalt	\$37,000.00	0.00%	0.00%	\$0.00
07620	Flashing and Sheet Metal	\$35,000.00			\$25,375.00
07620	Flashing and Sheet	\$35,000.00	60.00%	25.00%	\$25,375.00
08110	Steel Doors and Frames	\$0.00			\$0.00
08110	Steel Doors and Frames				\$0.00
08211	Interior Flush Wood Doors	\$0.00			\$0.00
08211	Wood Doors				\$0.00
08660	Interior Wire Mesh Window Guards	\$8,400.00			\$8,400.00
08660	Interior Wire Mesh Window Guards	\$8,400.00	100.00%	0.00%	\$8,400.00
08910	Aluminum Window Wall	\$282,514.00			\$195,640.95
08910	Aluminum Window	\$282,514.00	57.50%	23.50%	\$195,640.95
09260	Gypsum Board Systems	\$18,963.00			\$28,409.31
09260	Light Gauge Steel Framing	\$18,963.00	28.90%	0.00%	\$5,480.31
09260	Drywall Panels	\$45,858.00	5.00%	90.00%	\$22,929.00
09300	Tile	\$11,561.88			\$479.82
09300	Ceramic Tile	\$11,561.88	0.00%	8.30%	\$479.82
09650	Resilient Tile Flooring	\$29,535.00			\$295.35
09650	Resilient Tile Flooring - VCT	\$29,535.00	1.00%	0.00%	\$295.35
10500	Metal Lockers	\$80,044.00			\$45,785.17
10500	Metal Lockers	\$80,044.00	53.20%	8.00%	\$45,785.17
10651	Operable Panel Partitions	\$0.00			\$0.00
10651	Operable Panel Partitions				\$0.00

Total Values: \$4,697,854.00 \$1,665,518.04

Achieved LEED Percentages: 35.45%

LEED Percentage Goals: Need 30%

LEED Tracking Spreadsheet Example

LEED MR5 Regional Materials Tracking Log

Spec. #	Description	Construction		
		Material Cost	Regional Material	
			%	Value
08910	Aluminum Window Wall	\$282,514.00		\$282,514.00
08910	Aluminum Window	\$282,514.00	100.00%	\$282,514.00
09260	Gypsum Board Systems	\$18,963.00		\$45,858.00
09260	Light Gauge Steel Framing	\$18,963.00	0.00%	\$0.00
09260	Drywall Panels	\$45,858.00	100.00%	\$45,858.00
09300	Tile	\$11,561.88		\$11,561.88
09300	Ceramic Tile	\$11,561.88	100.00%	\$11,561.88
09644	Wood Gymnasium Floor	\$34,500.00		\$39,000.00
09644	Maple Athletic Flooring	\$34,500.00	100.00%	\$34,500.00
09644	Plywood Subfloor	\$4,500.00	100.00%	\$4,500.00
09648	Wood Stage Floor	\$1,500.00		\$1,500.00
09648	Subfloor	\$1,500.00	100.00%	\$1,500.00
09650	Resilient Tile Flooring	\$29,535.00		\$29,535.00
09650	Resilient Tile Flooring - VCT	\$29,535.00	100.00%	\$29,535.00
10651	Operable Panel Partitions	\$0.00		\$0.00
10651	Operable Panel Partitions			\$0.00
16130	Raceways and Boxes	\$0.00		\$0.00
16130	Raceways and Boxes			\$0.00
Total Values:		\$4,697,854.00		\$3,141,981.33
Achieved LEED Percentages:				66.88%
LEED Percentage Goals:				Need 40%

LEED Tracking Spreadsheet Example

LEED EQ4 Low-Emitting Materials Tracking Log

Spec. #	Description	Construction			LEED Maximum
		Compliance Path	Credit Option	VOC Content	
07841	Through-Penetration Firestop Systems				
07841	Specseal AS	NC v2.2	EQ 4.1	20 g/L	250 g/L
07841	Specseal ES	NC v2.2	EQ 4.1	15 g/L	250 g/L
07841	CP680 P/M	NC v2.2	EQ 4.1	7.6 g/L	250 g/L
07841	FS-One Sealant	NC v2.2	EQ 4.1	75 g/L	250 g/L
07841	CP680 P/M	NC v2.2	EQ 4.1	7.6 g/L	250 g/L
07841	CP617 Firestop Putty Pad	NC v2.2	EQ 4.1	5.2 g/L	250 g/L
07841	FS-One Sealant	NC v2.2	EQ 4.1	75 g/L	250 g/L
07841	3M Sealant CP-25WB+	NC v2.2	EQ 4.1	0 g/L	250 g/L
07841	3M Sealant IC-15WB+	NC v2.2	EQ 4.1	9.2 g/L	250 g/L
07841	Plumbing Firestop	NC v2.2	EQ 4.1	254.3 g/L	250 g/L
07900	Joint Sealants				
07900	Dow Corning 786	NC v2.2	EQ 4.1	33 g/L	250 g/L
07900	Pecora AC-20	NC v2.2	EQ 4.1	31 g/L	250 g/L
07900	Polyseamseal (Rejected)	NC v2.2	EQ 4.1		
07900	Sonolastic NP-2	NC v2.2	EQ 4.1	80 g/L	250 g/L
07900	Sonolastic SL-2 (Rejected)	NC v2.2	EQ 4.1		
07900	Dow Corning 790	NC v2.2	EQ 4.1	39 g/L	250 g/L
07900	Precast Terrazzo Joint Sealant	NC v2.2	EQ 4.1	43 g/L	250 g/L
08211	Interior Flush Wood Doors				
08211	Wood Doors	NC v2.2	EQ 4.4	Zero Urea-Formaldehyde	Zero Urea-Formaldehyde
09220	Cement Plaster				
09220	Cement Plaster	NC v2.2		50 g/L	
09300	Tile				
09300	Waterproofing Antifracture Membrane	NC v2.2			
09410	Terrazzo				
09410	Iso-crack Epoxy Membrane	NC v2.2		0 g/L	
09410	Terroxy Clear Resin	NC v2.2		0 g/L	
09410	Terroxy WB Urethane Sealer	NC v2.2	EQ 4.1	<250 g/L	250 g/L
09410	Terroxy Primer	NC v2.2	EQ 4.2	0 g/L	
09410	Terroxy Terra Clean	NC v2.2	EQ 4.2	0 g/L	
09410	Terroxy Moisture Vapor Primer	NC v2.2	EQ 4.2	0 g/L	
09644	Wood Gymnasium Floor				
09644	Wood Finish and Line Paint	NC v2.2	EQ 4.2	350 g/L	350 g/L
09644	Plywood Subfloor	NC v2.2	EQ 4.4	Zero Urea-Formaldehyde	Zero Urea-Formaldehyde
09650	Resilient Tile Flooring				
09650	Resilient Tile Flooring - Tile Adhesive	NC v2.2	EQ 4.1	49 g/L	50 g/L
09678	Resilient Wall Base Adhesive				
09678	Resilient Wall Base Adhesive	NC v2.2	EQ 4.1	0 g/L	50 g/L
09700	Epoxy Flooring				
09700	Epoxy Flooring	NC v2.2	EQ 4.2	84 g/L	100 g/L

SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Joliet Junior College - JJC - Site Landscaping.
- B. Owner's Name: Joliet Junior College; herein referred to as 'Owner'.
- C. Architect's Name: Legat Architects; herein referred to as 'Architect'. Civil Engineer: Ruetigger, Tonelli & Associate, Inc.
- D. Construction Manager's Name: Gilbane Building Company; herein referred to as 'Construction Manager' or 'CM'.
- E. The Project consists of the Landscaping and Sitework as described in drawings, specifications, and CM worksopes.

1.02 CONTRACT DESCRIPTION

- A. Refer to Construction Manager's Scope of Work.

1.03 DESCRIPTION OF WORK

- A. Scope of site work is shown on drawings and as specified. Refer to construction manager's scope of work for additional information.

1.04 WORK BY OWNER

- A. Owner will award a contract for various projects across campus of which contractor shall coordinate their work through the Construction Manager.
- B. Removal of hazzardous materials. Owner will contract separately to test and remove hazzardous materials.

1.05 FUTURE WORK

- A. Components of the drawings and specifications relate to future work which may not be included in the project scope. Refer to phasing diagrams and scope clarification by CM to clarify all items/work included in each bidders scope of work.

1.06 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing parking and site during the entire construction period.
- B. Owner intends to occupy a certain portion of the Project prior to the completion date for the conduct of normal operations.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner use of parking lots. Do not shut-down utilities or parking lots without Owner/CM approval. Refer to Construction Manager's scope document for schedule information.

1.07 CONTRACTOR USE OF SITE

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
 - 1. Owner and student parking/use of drives.

2. Use of site and premises by the public.
- C. Provide access to and from site as required by law and by Owner:
 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 2. Do not obstruct roadways, sidewalks, or other public ways without authorization from CM and Owner.
- D. Existing building spaces may not be used for storage. Certain portions of the site may be used for material storage with written authorization from CM.
- E. Time Restrictions:
 1. Limit conduct of especially noisy exterior work to hours as allowed by the city of Joliet.
- F. Utility Outages and Shutdown:
 1. Limit disruption of utility services to hours the building is unoccupied.
 2. Do not disrupt or shut down life safety systems, including but not limited to power fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
 3. Prevent accidental disruption of utility services to other facilities.
 4. Contractor shall be responsible for utility identification when digging, demolition and excavation. Costs for the repair of any/all utilities shall be at the expense of the contractor.

1.08 WORK SEQUENCE

- A. Construct Work in stages during the construction period as directed per the CM written schedule.
- B. Coordinate construction schedule and operations with CM and Owner.

1.09 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS

- A. Unless otherwise noted, all provisions of the sections listed below and within the table of contents shall apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.
- B. Section 01 21 00 - Allowances.
- C. Section 01 22 00 - Unit Prices.
- D. Section 01 30 00 - Administrative Requirements.
- E. LEED related sections.
- F. Section 01 40 00 - Quality Requirements.
- G. Section 01 50 00 - Temporary Facilities and Controls.
- H. Section 01 60 00 - Product Requirements.
- I. Section 01 70 00 - Execution and Closeout Requirements.
- J. Section 01732 - Waste Management
- K. Section 01 78 00 - Closeout Submittals.

1.10 CONTRACT - CONSTRUCTION

- A. Division 01 - General Requirements:
 1. All specification sections listed in table of contents.
- B. Provide all Work except Work specifically assigned to other contractors by CM work scope.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cash allowances.
- B. Contingency allowance.
- C. Inspecting and testing allowances.
- D. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

- A. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.
- B. Refer to CM scope of work for additional requirements.

1.03 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts, less cost of delivery to site, less applicable taxes.
- B. Refer to CM scope of work for allowances relating to trade contractors contract.
- C. Allowances may be drawn/tranfered into scope of work with written approval by CM ,Architect, and Owner.
- D. Allowances shall be carried on schedule of values and drawn from with written approval.
- E. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing..
- F. Contractor Responsibilities:
 - 1. Obtain proposals from suppliers and installers and offer recommendations.
 - 2. On notification of which additional work/products have been selected, execute purchase agreement with designated supplier and subcontractors.
 - 3. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - 4. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- G. Unspent allowances or differences in costs will be adjusted by Change Order as a credit to Owner prior to final payout.

1.04 CONTINGENCY ALLOWANCE

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- B. Funds will be drawn from the Owner's Contingency Allowance only by Change Order.

1.05 INSPECTING AND TESTING ALLOWANCES

- A. Costs Included in Inspecting and Testing Allowances: Cost of engaging an inspecting or testing agency; execution of inspecting and tests; and reporting results.
- B. Costs Not Included in the Inspecting and Testing Allowances:

1. Costs of incidental labor and facilities required to assist inspecting or testing agency.
 2. Costs of testing services used by Contractor separate from Contract Document requirements.
 3. Costs of retesting upon failure of previous tests as determined by Architect.
- C. Payment Procedures:
1. Submit one copy of the inspecting or testing firm's invoice with next application for payment.
 2. Pay invoice on approval by Architect.
- D. Differences in cost will be adjusted by Change Order.
- E. Refer to CM scope of work / Bid Form for any Inspecting and Testing Allowances to be carried in contractors contracts.
- F. Refer to CM scope of work / Bid Form for listing of all allowances to be included in contract.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by CM.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement Devices:
 - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.
- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- J. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify CM prior to starting work.

1.05 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the CM, multiplied by the unit price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected Products.

1.06 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of CM and Architect, it is not practical to remove and replace the Work, Cm/Architect will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of CM/Architect.
 - 2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.
- C. The authority of CM and Architect to assess the defect and identify payment adjustment is final.

1.07 SCHEDULE OF UNIT PRICES (refer to Bid Form for additional information)

- A. Removal of topsoil/subsoil \$___/CY
- B. Provide and install topsoil \$___/CY
- C. Seed and maintenance of Turf area \$___/SY
- D. refer to CM bid form for additional required unit prices.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electronic document submittal service.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Coordination drawings.
- G. Submittals for review, information, and project closeout.
- H. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Construction Manager's Scope of Work.
- B. Division 01300: LEED requirements.
- C. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
- D. Section 01 78 00 - Closeout Submittals: Project record documents.

1.03 PROJECT COORDINATION

- A. Project Coordinator: Construction Manager.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Manufacturer's instructions and field reports.
 - 6. Applications for payment and change order requests.
 - 7. Progress schedules.
 - 8. Coordination drawings.
 - 9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

3.02 PRECONSTRUCTION MEETING

- A. Construction Manager will schedule a meeting after the Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Construction Manager.
 - 5. Civil Engineer.
- C. Agenda:
 - 1. Submission of executed bonds and insurance certificates.
 - 2. Distribution of Contract Documents.
 - 3. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 - 4. Designation of personnel representing the parties to Contract, _____ and Architect.
 - 5. Designation of personnel representing the parties to Contract, Construction Manager and Architect.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

- A. CM will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Civil Engineer.
 - 5. Contractor's Superintendent.
 - 6. Major Subcontractors.
- C. Agenda:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements and occupancy prior to completion.
 - 3. Construction facilities and controls provided by Owner.
 - 4. Temporary utilities provided by Owner.
 - 5. Survey and site layout.
 - 6. Security and housekeeping procedures.
 - 7. Schedules.
 - 8. Application for payment procedures.
 - 9. Procedures for testing.
 - 10. Procedures for maintaining record documents.
- D. CM to record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, CM Architect, as appropriate to agenda topics for each meeting.
- C. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Maintenance of progress schedule.
 - 7. Corrective measures to regain projected schedules.
 - 8. Planned progress during succeeding work period.
 - 9. Maintenance of quality and work standards.
 - 10. Effect of proposed changes on progress schedule and coordination.
 - 11. Other business relating to Work.
- D. CM to record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work. Refer to CM schedule included in scope of work for milestones and completion.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

3.06 COORDINATION DRAWINGS

- A. Provide information required by Project Coordinator for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

3.07 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
 - 5. Coordination Drawings.
 - 6. LEED Requirements, forms, etc.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.

- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - CLOSEOUT SUBMITTALS.

3.08 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. LEED submittals and reports.
 - 3. Certificates.
 - 4. Test reports.
 - 5. Inspection reports.
 - 6. Manufacturer's instructions.
 - 7. Manufacturer's field reports.
 - 8. Other types indicated.
- B. Submit to CM for processing.

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. As Built drawings.
 - 6. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
- C. Samples: Submit the number specified in individual specification sections.
 - 1. Samples will not be returned to Contractor unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

- A. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Submittals not meeting these requirements will not be reviewed by the Architect.
- D. Deliver submittals to Construction Manager at the address directed.
- E. Schedule submittals to expedite the Project, and coordinate submission of related items.
- F. For each submittal for review, allow 10 days excluding delivery time to and from the Contractor. Allow 15 working days excluding delivery times for processing of submittals by Architect and

Engineers.

- G. CM shall review all submittals for completeness, coordination with other trades, product meets specification requirements, all components of submittal are present, including but not limited to shopdrawings, details, product data, certificates, samples, color selections, instructions, etc. CM shall send submittals to contractors requiring coordination/review. CM shall provide written comments on submittals relating to coordination of trades, completeness, details and accuracy.
- H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- I. Provide space for Contractor, CM and Architect review stamps.
- J. When revised for resubmission, identify all changes made since previous submission.
- K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- L. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01 35 14.01

LEED-NC 2009 CREDIT SUMMARY

PART 1 GENERAL

1.01 DEFINITIONS

- A. LEED Rating System: LEED-NC 2009 edition.
- B. Required: Achievement of this credit is essential for certification of this project.
- C. Preferred: Achievement of this credit would be desirable but is not mandatory.
- D. Not Required: Achievement of this credit is not expected or not possible for this project.

PART 2 CREDIT SUMMARY

2.01 CERTIFICATION TO BE ACHIEVED: Silver, requiring minimum of 50 points.

- A. Note: Credits relating to Site Landscape are only identified.
- B. Contractors shall submit credit/information forms separated for each of the 5 project site areas: Science, Automotive, Campus Center (greenway), Health Professions, and Facility services.

2.02 SUSTAINABLE SITES (SS): 11 Points To Be Achieved.

- A. SS Prerequisite 1 - Required - No points - Construction Activity Pollution Prevention.
 - 1. During Construction:
 - a. Preventive measures and remediation are specified in Section 01 57 13.
 - b. Dust control and basic surface drainage are specified in Section 01 70 00.
 - c. Preventive measures prescribed by state law will be followed.
 - 2. Permanent erosion and sedimentation prevention features are to be provided:
 - a. Turf (for lawns) is specified in Section 32 92 19 (seeding).
 - b. Plants are specified in Section 32 93 00.
- B. SS Credit 5.1 - Undecided - 1 point - Site Development: Protect or Restore Habitat.
 - 1. The project site has previously been developed:
 - a. No modifications to the existing site design are required.
 - b. At least 50 percent of the site area not occupied by the building is to be covered with native or adapted vegetation.
 - c. Plants are specified in Section 32 93 00.

2.03 WATER EFFICIENCY (WE): 4 Points To Be Achieved.

- A. WE Prerequisite 1 - Required - No points - Water Use Reduction, 20% Reduction.
 - 1. Appropriate high efficiency and/or waterless fixtures are specified in Section 22 40 00.
- B. WE Credit 1.1 - Undecided - 2 points - Water Efficient Landscaping: Reduce by 50%.
 - 1. The landscaping does not require irrigation and no permanent irrigation system is provided.
 - a. The climate provides adequate rainfall for the landscaping intended without need for irrigation.
 - b. Plants that do not require irrigation are specified in Section 32 93 00. (other than initial irrigation during warranty period).
- C. WE Credit 1.2 - Undecided - 2 points - Water Efficient Landscaping: No Potable Use or No Irrigation. (after initial irrigation during warranty period)
 - 1. The landscaping does not require irrigation and no permanent irrigation system is provided.
 - a. The climate provides adequate rainfall for the landscaping intended without need for irrigation.

- b. Plants that do not require any irrigation are specified in Section 32 93 00. Other than initial irrigation during warranty period)

2.04 MATERIALS & RESOURCES: ___ Points To Be Achieved.

- A. MR Prerequisite 1 - Required - No points - Storage & Collection of Recyclables.
- B. MR Credit 4.1 - Required - 1 point - Recycled Content: 10% (post-consumer plus 1/2 pre-consumer).
 - 1. The definition of recycled content for the purposes of the contract documents is included in Section 01 60 00; qualifying products do not include plumbing, HVAC, electrical, or communications equipment, piping, conduit, ductwork, or wiring.
 - 2. Contractor's reporting and measurement requirements are specified in Section 01 35 15 and Section 01 60 00; calculation of project totals is not the responsibility of Contractor.
- C. MR Credit 4.2 - Required - 1 point - Recycled Content: 20% (post-consumer plus ½ pre-consumer).
 - 1. Same as for MR Credit 4.1, but increased quantity.
- D. MR Credit 5.1 - Undecided - 1 point - Regional Materials: 10% Extracted, Processed & Manufactured Regionally.
 - 1. For the purposes of the contract documents, the term "regionally-sourced" is used instead of "regional materials" and is defined in Section 01 60 00 in the same way as for this credit.
 - 2. We don't know which products might qualify for this credit but want to pursue it anyway, so we will require the submittal of the Regionally-Sourced Products Form for each product used; this will be done by requiring the submittal of the form along with the first application for payment for the product; the form is specified in Section 01 35 16.
 - 3. Other specific products that must be regionally-sourced are specified in the appropriate section(s).
 - 4. Contractor's reporting and measurement requirements are specified in Section 01 35 15 and Section 01 60 00; calculation of project totals is not the responsibility of Contractor.
- E. MR Credit 5.2 - Required - 1 point - Regional Materials: 20% Extracted, Processed & Manufactured Regionally.
 - 1. Same as for MR Credit 5.1, but for an additional 10%.

END OF SECTION

SECTION 01 35 15

LEED CERTIFICATION PROCEDURES

PART 1 GENERAL

1.01 PROJECT GOALS

- A. This project has been designed to achieve the LEED Silver (minimum 50 points rating as defined in the LEED(r) Green Building Rating System(tm) for New Construction and Major Renovations, 2009 Edition.
- B. A LEED Consultant has been employed by Owner to review LEED submittals and reports.
- C. The Contractor(s) is responsible for submitting all information required for the LEED certification application for LEED certification. The construction manager is responsible to manage track and assemble the final application for all LEED Construction Credits for the Architect to compile and submit.
- D. Many of the LEED credits can be achieved only through intelligent design of the project and are beyond the control of the Contractor. However, certain credits relate to the products and procedures used for construction. Therefore, the full cooperation of the Contractor and subcontractors is essential to achieving final certification.
- E. Contractor shall familiarize himself with the relevant requirements and provide the necessary information and instruction to all subcontractors and installers.
- F. Since Contractor and subcontractors may not be familiar with LEED requirements, this section includes a summary of the products and procedures intended to achieve LEED credits.
 - 1. Some credits are marked PREREQUISITE; these must be achieved regardless of the level of certification; many are dependent on proper performance by Contractor and subcontractors.
 - 2. Other credits involve quantifying percentages by weight and cost; these require careful recordkeeping and reporting by the Contractor.
 - 3. See www.usgbc.org for more information.
- G. Because the LEED rating itself does not have monetary value but achievement of the desired rating is dependent upon performance of individual contractors of meeting or exceeding requirements set forth in these specifications. Contractors are required to meet minimum requirements specified relating to the individual credits as identified in each section. Products which do not meet the specified requirements shall be replaced by the contractor at no additional costs to the owner, CM, Architect and other contractors. Conformance with meeting the minimum specified requirements are the sole responsibility of the contractor for such product.

1.02 RELATED REQUIREMENTS

- A. Sections that include requirements intended to achieve LEED credits include, but are not limited to, the following:
- B. Section 01 10 00 - Summary:
 - 1. Contractor use of premises; SS Credit 5.1.
- C. Section 01 35 16 - LEED Submittal Forms: Procedures for using the forms.
 - 1. 01 35 16.01 - LEED Material Cost Summary; to report material only cost categories for computations necessary for MR Credits 3, 4.1, 4.2, 5.1, 5.2, and 6.
 - 2. 01 35 16.04 - LEED New Product Content Form; for content percentages for recycled, rapidly renewable, and certified wood credits, with material cost; MR Credits 4.1, 4.2, 6, and 7; used in conjunction with Wood-Containing and Metal-Containing Product Lists as well as separately.

3. 01 35 16.05 - LEED New Product Source Form; for documenting source of new products; MR Credit 5.1 and 5.2.
- D. Section 01 57 13 - Temporary Erosion and Sediment Control: Preventive measures and remediation; SS PREREQUISITE 1..
 - E. Section 01 60 00 - Product Requirements: Overall project requirements for:
 1. Recycled content; MR Credits 4.1 and 4.2.
 2. Regionally-sourced products; MR Credits 5.1 and 5.2.
 - a. Contractor is not required to provide any particular minimum percentage of regionally-sourced products; however, to collect the information necessary to determine whether these credits can be achieved, Contractor is required to submit the LEED New Product Source Form for every product for which application for payment is made.
 - F. Section 01 70 00 - Execution and Closeout Requirements:
 1. Dust control and basic surface drainage; SS Prerequisite 1.
 - G. Section 01 74 19 - Construction Waste Management and Disposal:
 1. Construction and demolition waste management; MR Credit 1.1 and 1.2.
 2. Construction and demolition waste management; MR Credit 2.1 and 2.2.
 - H. Section 31 22 00 - Grading:
 1. For sediment traps and retention ponds; SS Prerequisite 1.
 - I. Section 32 11 25 - Turf Surfaced Aggregate Base Course:
 1. For erosion and sedimentation control; SS PREREQUISITE 1.
 2. For reducing run-off rate and quantity; SS Credit 6.1.
 - J. Section 32 13 13 - Concrete Paving:
 1. For reducing non-roof heat island effect; SS Credit 7.1.
 - K. Section 32 14 13 - Precast Concrete Unit Paving: Open grid concrete unit pavers:
 1. For erosion and sedimentation control; SS PREREQUISITE 1.
 2. For reducing non-roof heat island effect; SS Credit 7.1.
 - L. Section 32 92 19 - Seeding:
 1. Turf for erosion control; SS PREREQUISITE 1.
 2. Turf for modifying existing stormwater flows; SS Credit 6.1.
 - M. Section 32 93 00 - Plants:
 1. For erosion and sedimentation control; SS PREREQUISITE 1.
 2. Plants that do not require irrigation; WE Credit 1.1 and 1.2.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for additional submittal procedures.
- B. Submit LEED submittals and reports directly to Construction manager's LEED Consultant, not to Architect, unless otherwise indicated.
- C. LEED Submittal/Report: For each product with the notation "show quantity on LEED submittal or report," submit a report with the following information:
 1. Submit with each Application for Payment; update the Report each period with latest period shown separately:
 2. Identify each product with:
 - a. Name and manufacturer.
 - b. Specification section number.
 - c. Applicable Credit(s).
 - d. Net weight per unit.

- e. Quantity installed.
 - f. Material cost per unit.
 - g. Total material cost.
3. Attach evidence of compliance from either the manufacturer or an independent agency.

1.04 INFORMATION SOURCES

- A. U.S. Green Building Council (USGBC); 1015 18th Street, NW, Suite 805, Washington, DC 20036. Tel: (202) 82-USGBC or (202) 828-7422. Fax: (202) 828-5110. www.usgbc.org.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 16

LEED SUBMITTAL FORMS

1.01 PURPOSE

- A. These forms are for the Contractor's use in submitting documentation to be used to determine whether particular credits have been achieved. The cooperation of subcontractors, suppliers, and manufacturers is required.
- B. These forms apply to the following LEED Credits:
 - 1. MR Credits 4.1 and 4.2 - Recycled Content.
 - 2. MR Credits 5.1 and 5.2 - Regional Materials.

1.02 FORMS

- A. 01 35 16.01 - LEED Material Cost Summary Form: Certification by Contractor. LEED for New Construction version 2009 reporting form for Credits MR4 and MR5 Certification and/or Manufacture.

1.03 PROCEDURES

- A. All LEED submittal forms are to be submitted by Contractor; certifications are to be made by indicated party.
- B. Where a LEED Submittal is called for, fill out and submit the appropriate form.
 - 1. Fill out one form for each different brand name product and each different manufacturer of a lot of commodity products.
 - 2. Where required attachments are specified, attach the documentation to the back of the form.
- C. Each form must be signed by the entity capable of certifying the information.
 - 1. Certification signatures must be made by an officer of the company.
 - 2. For products, certification must be made by the manufacturer not the supplier.
 - 3. For custom fabricated products, certification by the fabricator is acceptable.
- D. Submit the completed forms in accordance with the requirements of Section 01 30 00 - Administrative Requirements, as information submittals.
 - 1. Give each form a unique submittal number.
 - 2. Do not combine LEED forms with product data or shop drawing submittals.

END OF SECTION

LEED New Construction Version 2009 Reporting Form for Credits MR4 and MR5

Project Name

Project Address, City, State Zip Code

Material or Product:

Material Cost (less labor and equipment):

Contractor / Installer:

Manufacturer:

Contractor / Installer Address:

Manufacturer Address:

Contact:

Please include (check once complete):

- Your signature confirming the accuracy of the information provided
- Fully completed reporting form
- Option 1: Signed letter from the manufacturer **supporting the data provided**
- Option 2: Manufacturer's cut sheet **supporting the data provided**

Signed by:

Date:

Company:

MR Credit 4 Recycled Content

If the product contains a single component, fill in the chart below:

Percentage of Post-Consumer Content (PC):	%
Percentage of Pre-Consumer Content (PI):	%

If only a portion of the assembly contains recycled content, fill in the chart below to calculate the percentages by weight:

Component	Weight	Post-Consumer (PC)	Pre-Consumer (PI)
	lbs	%	%
	lbs	%	%
	lbs	%	%
Calculated Totals:	lbs	%	%

MR Credit 5 Regional Materials

Manufacturer / Fabricator:

Location (City, State):

Miles from Site:

Harvest / Extraction:

Component	Weight	Location (City, State)	Miles from Site
	lbs		
	lbs		
	lbs		
Total Weight:	lbs	Calculated Percentage of Regional Material:	%

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Warranty
- G. Testing and inspection services.
- H. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

- A. Section 01 21 00 - Allowances: Allowance for payment of testing services.
- B. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- C. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

- A. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2009.
- B. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2008.
- C. ASTM E 329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2009.
- D. ASTM E 543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.

1.04 SUBMITTALS

- A. Testing Agency Qualifications:
 - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- B. Design Data: Submit for Architect's knowledge for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect, Construction Manager and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.

- c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Conformance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
- 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit or for Owner.
- 1. Submit report in duplicate within 15 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.05 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 WARRANTY

- A. Unless noted otherwise, all products and installations shall be warrantied for a minimim of 1 year after final acceptance and payment by the Owner. Warraty shall include replacement and installation to original specified condition.

1.07 TESTING AND INSPECTION AGENCIES

- A. CM/Owner will employ and pay for services of an independent testing agency to perform other specified testing.
- B. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing required.

- B. Unless noted otherwise, material and soil testing to be completed and paid for by the Owner.
- C. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Construction Manager, Architect and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Construction Manager, Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 5. Perform additional tests and inspections required by Construction Manager or Architect.
 - 6. Attend preconstruction meetings and progress meetings when requested by CM.
 - 7. Submit reports of all tests/inspections specified.
- D. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- E. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify CM, Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- G. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.

- B. If, in the opinion of Construction Manager and Architect, it is not practical to remove and replace the Work, Architect will recommend an appropriate remedy to the Owner's representative or adjust payment.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS

- A. Refer to CM scope of work to requirements relating to field offices, temporary utilities, waste removal, fencing, barriers, sanitary facilities, project signs, security, parking and vehicular access.

1.03 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes unless directed otherwise by CM scope of work.
- B. Existing facilities may not be used.
- C. Pay meter and use fees as required by municipality for water usage from hydrants..

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures as identified by CM. Do not use existing facilities.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Provide fencing at each tree minimum 8 feet from trunk. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

- A. Provide type as directed by CM.

1.07 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.08 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with CM and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Clean roads and drives of mud/debris daily. Street sweep weekly as required..
- E. Designated existing on-site roads may be used for construction traffic.
- F. Park in areas designated by CM.
- G. Do not allow vehicle parking on existing sidewalks of landscape/grass areas..

1.09 WASTE REMOVAL

- A. See Section 01 74 19 - Waste Management, for additional requirements.
- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- C. Provide containers with lids. Remove trash from site periodically.
- D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.10 FIELD OFFICES

- A. Provide as authorized by CM.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Performance bond.
- E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED REQUIREMENTS

- A. Section 01 35 15 - LEED Certification Procedures: LEED credits relating to erosion and sedimentation control.
- B. Section 31 10 00 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
- C. Section 31 22 00 - Grading: Temporary and permanent grade changes for erosion control.
- D. Section 32 11 23 - Aggregate Base Courses: Temporary and permanent roadways.
- E. Section 32 92 19 - Seeding: Permanent turf for erosion control.

1.03 REFERENCE STANDARDS

- A. ASTM D 4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus; 2007.
- B. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2009).
- C. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2004 (Reapproved 2009).
- D. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2008.
- E. ASTM D 4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.
- F. ASTM D 4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2002 (Reapproved 2009).
- G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition.
- H. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; Federal Highway Administration; 1995.

1.04 PERFORMANCE REQUIREMENTS

- A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.
- B. Comply with all requirements of County and City of Joliet for erosion and sedimentation control, even though this project is not required by law to comply.
- C. Best Management Practices Standard: Federal Highway Administration Best Management Practices for Erosion and Sediment Control.
- D. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
 - 1. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
- F. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
- G. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- H. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
- I. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- J. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1. Prevent windblown soil from leaving the project site.
 - 2. Prevent tracking of mud onto public roads outside site.
 - 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- K. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- L. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- M. Open Water: Prevent standing water that could become stagnant.
- N. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. LEED Submittals: Submit all submittals required in this section in accordance with procedures specified in Section 01 35 15.
- C. Erosion and Sedimentation Control Plan:
1. Submit not less than 30 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
 2. Include:
 - a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
 - b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
 - c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - e. Other information required by law.
 - f. Format required by law is acceptable, provided any additional information specified is also included.
 3. Obtain the approval of the Plan by authorities having jurisdiction.
 4. Obtain the approval of the Plan by Owner.
- D. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- E. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D 4751.
 2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D 4491.
 3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D 4355 after 500 hours exposure.
 4. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in

- machine direction; when tested in accordance with ASTM D 4632.
- 5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D 4632.
- 6. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D 4533.
- 7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

B. Silt Fence Posts: One of the following, minimum 5 feet long:

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
 - 1. Width: As required; 20 feet, minimum.
 - 2. Length: 50 feet, minimum.
 - 3. Provide at each construction entrance from public right-of-way.
 - 4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- C. Linear Sediment Barriers: Made of silt fences.
 - 1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - 2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - a. Slope of Less Than 2 Percent: 100 feet..
 - b. Slope Between 2 and 5 Percent: 75 feet.
 - c. Slope Between 5 and 10 Percent: 50 feet.
 - d. Slope Between 10 and 20 Percent: 25 feet.
 - e. Slope Over 20 Percent: 15 feet.
- D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
 - 2. Straw bale row blocking entire inlet face area; anchor into pavement.
- E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.
- G. Soil Stockpiles: Protect using one of the following measures:
 - 1. Cover with polyethylene film, secured by placing soil on outer edges.
 - 2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
- I. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
 - 1. Excavate minimum of 6 inches.
 - 2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.

- B. Silt Fences:
 - 1. Store and handle fabric in accordance with ASTM D 4873.
 - 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 - 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - 5. Install with top of fabric at nominal height and embedment as specified.
 - 6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - 7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

3.05 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 - 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 - 2. Remove silt deposits that exceed one-third of the height of the fence.
 - 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Clean out temporary sediment control structures weekly and relocate soil on site.
- E. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. LEED-related product requirements.
- C. Re-use of existing products.
- D. Transportation, handling, storage and protection.
- E. Product option requirements.
- F. Substitution limitations and procedures.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. refer to Construction Manager's scope of work for additional requirements.
- B. Section 01 10 00 - Summary: .
- C. Section 01 35 15 - LEED Certification Procedures: Requirements for LEED reports.
- D. Section 01 40 00 - Quality Requirements: Product quality monitoring.
- E. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 REFERENCE STANDARDS

- A. 16 CFR 260 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; current edition.
- B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

1.04 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- D. LEED Submittals: Use forms provided in Section 01 35 16.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Do not use products having any of the following characteristics:
 - 1. Made using or containing CFC's or HCFC's.
- C. Regionally-Sourced Products:
 - 1. Overall Project Requirement: Provide materials amounting to a minimum of 40 percent of the total value of all materials (excluding plumbing, HVAC, electrical, elevators, and other equipment) that have been extracted, harvested, or recovered, as well as manufactured, within a radius of 500 miles from the project site.
 - a. This provision is applicable to LEED Credit MR 5.1; show quantity on LEED report.
 - b. This provision is applicable to LEED Credit MR 5.2; show quantity on LEED report
 - 2. Specific Product Categories: Provide regionally-sourced products as specified elsewhere.
 - 3. LEED Submittals: Indicate location of manufacture; in all cases indicate location of final assembly; for harvested products, indicate location of harvest; for extracted (i.e. mined) products, indicate location of extraction; for products involving multiple manufacturing steps, indicate all locations of manufacture or assembly; provide manufacturer or supplier certification of location information.
- D. Motors: Refer to Section 22 05 13, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.
- E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver and place in location as directed; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Architect will consider requests for substitutions only within 15 days after date of Agreement.
- C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

- E. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- G. Substitution Submittal Procedure:
 - 1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - 3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, except payment procedures.
- J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Refer to Construction Manager's Scope of work for additional requirements of this contract.
- B. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- C. Section 01 30 00 - Administrative Requirements: Submittals procedures.
- D. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- E. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- F. Section 01 57 13 - Temporary Erosion and Sedimentation Control: Additional erosion and sedimentation control requirements.
- G. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- H. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- I. Individual Product Specification Sections:

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.

6. Any work, patching, or scope which is beyond the base contract scope and may require additional payments to contractor. Contractor must request and receive approval prior to start of work for any are outside of bid proposal/scope.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

- A. For site survey and layout work, the construction manager will employ and pay for a land surveyor to layout work and identify pavement patching areas.
- B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Illinois.

1.05 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 1. Minimize amount of bare soil exposed at one time.
 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:

1. Review conditions of examination, preparation and installation procedures.
 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify CM of any discrepancies discovered.
- C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to CM the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 2. Grid or axis for structures.
 3. Building foundation, column locations, ground floor elevations.
- H. Periodically verify layouts by same means.
- I. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

- A. Protect existing work to remain.
 1. Prevent movement of structure or adjacent pavement/soil; provide shoring and bracing.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
- B. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
- C. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- D. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

- E. Do not begin new construction in alterations areas before demolition is complete.
- F. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-conforming work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- C. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

- D. Protect installed work including seeded and landscaped areas. Utilize CM approved materials. Remove when directed.
- E. Prohibit traffic from landscaped areas.
- F. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate with requirements of Manufacturer Commissioning Agent (Aereator system).
- B. Coordinate schedule for start-up of various equipment and systems.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- E. Perform instruction in a classroom environment located at Campus.
- F. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- H. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.12 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Use cleaning materials that are nonhazardous.

- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean debris from pavement, lawns, sidewalks, and drainage systems.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Substantial Completion.
- D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
- E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- F. Accompany Project Coordinator on preliminary final inspection.
- G. Notify Architect when work is considered finally complete.
- H. Complete items of work determined by Architect's final inspection.

3.14 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
 - 1. Aluminum and plastic beverage containers.
 - 2. Corrugated cardboard.
 - 3. Wood pallets.
 - 4. Clean dimensional wood: May be used as blocking or furring.
 - 5. Land clearing debris, including brush, branches, logs, and stumps.
 - 6. Concrete.
 - 7. Asphalt paving.
 - 8. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
- E. LEED Certification for this project is dependent on diversion of 75 percent, by weight, of potential landfill trash/waste by recycling and/or salvage.
- F. The following recycling incentive programs are mandatory for this project; Contractor is responsible for implementation: Tracking and submitting certification for Construction Waste Management. Credit 2 - Materials and Resources.
- G. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- H. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.
- I. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- J. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: List of items to be salvaged from the existing building for relocation in project or for Owner.
- B. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

- C. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- D. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- E. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.
- F. Section 31 10 00 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. LEED Submittals: Submit Landfill Alternatives Proposal, Waste Management Plan, and Waste Disposal Reports in accordance with procedures specified in Section 01 35 15.

- C. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.
- D. Waste Management Plan: Include the following information:
1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
 2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
 3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
 4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
 5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
 6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
 7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.
- E. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 2. Submit Report on a form acceptable to Owner.
 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

6. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
 7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.
- F. Recycling Incentive Programs:
1. Where revenue accrues to Contractor, submit copies of documentation required to qualify for incentive.
 2. Where revenue accrues to Owner, submit any additional documentation required by Owner in addition to information provided in periodic Waste Disposal Report.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

- A. See Section 01 60 00 - Product Requirements for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 60 00:
 1. Relative amount of waste produced, compared to specified product.
 2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Price.
 3. Proposed disposal method for waste product.
 4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 1. Pre-bid meeting.
 2. Pre-construction meeting.
 3. Regular job-site meetings.

- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
 - 3. Locate enclosures out of the way of construction traffic.
 - 4. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 5. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
 - 6. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Refer to Construction Manager's scope of work for additional requirements.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Construction Manager for review and submission to the Architect prior to claim for final payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 2. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.

- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 3. Field changes of dimension and detail.
 - 4. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- D. Provide servicing and lubrication schedule, and list of lubricants required.
- E. Include manufacturer's printed operation and maintenance instructions.
- F. Include sequence of operation by controls manufacturer.
- G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- H. Provide control diagrams by controls manufacturer as installed.
- I. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

- J. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- K. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- L. Include test and balancing reports.
- M. Additional Requirements: As specified in individual product specification sections.

3.04 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.05 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for

items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- I. Provide minimum one (1) year warranty on all work. Refer to individual specification sections for longer warranty requirements for specific products.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

THIS SPECIFICATION SECTION HAS USGBC LEED® POINT RAMIFICATIONS. CONTRACTOR(S) WILL EXECUTE ALL WORK IN FULL COMPLIANCE TO LEED® REQUIREMENTS ASSOCIATED WITH THIS AND RELATED SPECIFICATION SECTIONS. THE LEED® RELATED SPECIFICATIONS AND FORMS HAVE BEEN INCLUDED IN DIVISION 1. SPECIFIC REQUIREMENTS OF THIS SECTION AND GENERAL REQUIREMENTS INDICATED IN DIVISION 1 APPLY TO THIS SECTION OF THE SPECIFICATION. WHERE DISCREPANCIES EXIST BETWEEN SPECIFICATION REFERENCES, THE MOST STRINGENT SHALL APPLY.

2.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Concrete foundation walls.
- C. Concrete reinforcement.
- D. Concrete curing.

2.02 REFERENCE STANDARDS

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International; 2006.
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- C. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; American Concrete Institute International; 1998 (Reapproved 2004).
- D. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- F. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 1999.
- G. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 1988 (Reapproved 2002).
- H. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2008.
- J. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute International; 2004.
- K. ASTM A 185/A 185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- L. ASTM A 767/A 767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2009.
- M. ASTM C 33 - Standard Specification for Concrete Aggregates; 2008.

- N. ASTM C 39/C 39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2009a.
- O. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete; 2009a.
- P. ASTM C 143/C 143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2009.
- Q. ASTM C 150 - Standard Specification for Portland Cement; 2007.
- R. ASTM C 173/C 173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2009.
- S. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2006.
- T. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2008a.
- U. ASTM C 1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2005.

2.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.
- C. LEED Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use LEED New Product Content Form.
- D. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

2.04 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

2.05 LAYOUT OF FORMWORK

- A. Stake layout of foundation wall prior to excavation and assembly of formwork. Request approval of final location and elevations from Architect. Relocate layout of wall as directed and request approval of layout of wall by Architect.
- B. Locate 2 control joints in foundation wall which will extend through masonry above. Locate at approximately 1/3 points. Coordinate with stone masonry.

PART 2 PRODUCTS

3.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347 to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance. Material to 12 below finished grade shall be bendable previously unused. Acceptable materials: Smooth face MDF board, PVC form-liner, or other architect approved equal product.
2. Form Coating: Release agent that will not adversely affect concrete.
3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

3.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
 1. Type: Deformed billet-steel bars.
 2. Finish: Galvanized in accordance with ASTM A 767/A 767M, Class I, unless otherwise indicated.
- B. Steel Welded Wire Reinforcement: Galvanized ASTM A 185/A 185M, plain type.
 1. Form: Flat Sheets.
 2. Wire Gage: W 5.5 x W 5.5.
- C. Reinforcement Accessories:
 1. Tie Wire: Annealed, minimum 16 gage.
 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

3.03 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type IA - Air Entraining portland type.
- B. Fine and Coarse Aggregates: ASTM C 33.
- C. Fly Ash: ASTM C 618, Class C or F.
- D. Calcined Pozzolan: ASTM C 618, Class N.
- E. Silica Fume: ASTM C 1240, proportioned in accordance with ACI 211.1.
- F. Water: Clean and not detrimental to concrete.
- G. Fiber Reinforcement: Synthetic fiber shown to have long-term resistance to deterioration when exposed to moisture and alkalis; 1/2 inch length.

3.04 ACCESSORY MATERIALS

3.05 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Proportioning Structural Lightweight Concrete: Comply with ACI 211.2 recommendations.
- C. Normal Weight Concrete:
 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 4,000 psi.
 2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
 3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
 4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
 5. Water-Cement Ratio: Maximum 40 percent by weight.
 6. Total Air Content: 4 percent, determined in accordance with ASTM C 173/C 173M.
 7. Maximum Slump: 3 inches.
 8. Maximum Aggregate Size: 5/8 inch.

3.06 MIXING

- A. Transit Mixers: Comply with ASTM C 94/C 94M.

PART 3 EXECUTION

4.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section. Refer to layout requirements listed above.

4.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Locate form ties to be minimum 12" below finished levation. No form ties will be exposed.
- C. Verify that forms are clean and free of rust before applying release agent.
- D. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

4.03 INSTALLING REINFORCEMENT

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

4.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Notify Architect not less than 24 hours prior to commencement of placement operations.
- C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Place concrete continuously between predetermined expansion, control, and construction joints.
- F. Do not interrupt successive placement; do not permit cold joints to occur.

4.05 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

4.06 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from

premature drying, excessively hot or cold temperatures, and mechanical injury.

- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. After concrete has cured, install sealant at control joints of similar color to concrete. (refer to masonry section for product).

4.07 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.

4.08 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

END OF SECTION

SECTION 04 43 01

STONE MASONRY WALL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cut stone veneer at exterior sign wall.
- B. Metal anchors and accessories.
- C. Setting mortar.
- D. Aluminum sign lettering to be provided and installed separately by Owner under separate contract.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast in place concrete: formwork, layout and control joints.

1.03 REFERENCE STANDARDS

- A. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.
- B. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2009.
- C. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.
- D. ASTM C 270 - Standard Specification for Mortar for Unit Masonry; 2008a.
- E. ASTM C 568 - Standard Specification for Limestone Dimension Stone; 2008.
- F. ILI (HB) - Indiana Limestone Handbook; Indiana Limestone Institute of America, Inc.; 2007, 22nd Edition.
- G. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- H. Comply with Illinois Department of Transportation's "Standard Specifications for Road and Bridge Construction" latest edition (IDOT Std. Specs.).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on stone units, concrete, mortar, pins, and reinforcement.
- C. Submit LEED Credit MRc 5.1/5.2 - Location of manufacturing plant, manufacturer's name, product cost and location of extraction or harvest of raw materials or recovered within 500 miles of site. Include statement indicating percentage by weight which was extracted, harvested, recover within 500 miles of site.
- D. LEED Credit MRc 4.1/4.2 - Recycled content, including percentage of preconsumer (post-industrial) and post consumer recycled content. Also provide manufacturer's name, product cost and steel processing furnace type.

- E. Samples: Submit two stone samples illustrating minimum and maximum stone sizes, color range, texture, and markings. submit portion of cap for review.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type required by this section, with minimum 5 years of documented experience.
- B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. Comply with Illinois Department of Transportation's "Standard Specifications for Road and Bridge Construction" latest edition (IDOT Std. Specs.).

1.07 MOCK-UP

- A. Construct stone wall mock-up, 4 feet long, 1 foot wide by full height; include stone cap, sealant joints, stone anchor accessories and corner condition in mock-up.
- B. Mock-up may remain as part of the Work if accepted by architect.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect stone from discoloration during storage on site.
- B. Provide ventilation to prevent condensation from forming on stone.

1.09 FIELD CONDITIONS

- A. Cold Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 STONE

- A. Stone - Locally quarried Seam-Faced stone. Bromberek's Flagstone Co. Office 630-257-0686, quarry 815-740-1423. Comply with ASTM 568 Classification 2 - Medium Density.
- B. Stone sizes: Random lengths 12" - 24", 8" nominal width, 6" approximate height. Sort stones to be similar in height as installed in horizontal coursing.
- C. Stone Caps - Same as above with natural texture top face 6" nominal thickness. Manufacture to full width of wall.
- D. LEED Credit MRc 5.1/5.2: masonry and reinforcing products shall be manufactured within 500 miles of project site. Recycled

2.02 MORTAR

- A. Setting Mortar: ASTM C 270, Type N, using the Proportion Method.

2.03 ACCESSORIES

- A. Concrete:
 - 1. Portland Cement: Per IDOT Std. Specs. Section 1001
 - 2. Fly Ash: AASHTO M 295 Class C.
 - 3. Ground Granulated Blast-Furnace Slag: AASTO M 302.
 - 4. AGGREGATE: Per IDOT Std. Specs. Section 1003; 1004.
 - 5. Water: Per IDOT Std. Specs. Section 1002.
 - 6. Admixtures: Per IDOT Std. Specs. Section 1021.
 - 7. Concrete Mixes: Prepare design mixes, proportioned according to IDOT Std. Specs Section 1020 Class Sl.

- 8. Leed Credit 5.1/5.2 Concrete, aggregate, sand and water shall be manufacturer within 500 miles of site.
- 9. Leed Credit 4.1/4.2 Concrete shall contain 50% recycled materials.
- B. Horizontal Joint Reinforcement: Ladder type; steel wire, hot dip galvanized per ASTM A 123/A 123M, 3/16 inch side rods with 0.1875 inch cross ties.
- C. Steel Reinforcement: ASTM A615 Grade 60 reinforcing. #4 rebars minimum. Meet LEED requirements Credits 4.1/4.2 for minimum 80 % recycled content and Credit 5.1/5.2 to manufactured within 500 miles of site
- D. Other Anchors in Direct Contact with Stone: ASTM A 666, Type 304, stainless steel, of sizes and configurations required for support of stone and applicable superimposed loads.
- E. Setting Buttons and Shims: Lead.
- F. Sealant: General Purpose Exterior Sealant for Stone: Silicone, ASTM C920, Grade NS, class 25, for stone, non-staining, low modulus, highly flexible, single component. Color selected by architect. Submit manufacturer installation instructions. Provide backer rod at all joints. Primers as recommended by manufacturer.
 - 1. Dow Corning 756SMS
 - 2. GE SilPruf SCS 2000
 - 3. Bondaflex.
- G. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

2.04 STONE FABRICATION

- A. Form stone corners and edges to natural seam/ split joint profile. Clean jagged corners from stone in preparation for setting.
- B. Slope exposed top surfaces of stone and horizontal sill surfaces for shedding water.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that support work and site conditions are ready to receive work of this section.
- B. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

- A. Confirm layout and location of stone sign with Architect. Stake out corners, curve, and height prior to excavating for footing. Modify layout and stakes at direction of the Architect and CM. Proceed only with written approval.
- B. Coordinate location of 2 control joints located at third points aligning with foundation control joints. Stone control joint to stagger with stone units. Joints to be sealed and installed with backer rod.
- C. Work with CM and Owner to determine all utilities within work area. protect from damage.
- D. Establish lines, levels, and coursing. Protect from disturbance.
- E. Clean stone prior to erection. Do not use wire brushes or implements that mark or damage exposed surfaces.
- F. Clean sawn surfaces of rust stains and iron particles.

3.03 INSTALLATION

- A. Size stone units to fit opening dimensions and perimeter conditions.

- B. Wet absorptive stone in preparation for placement to minimize moisture suction from mortar.
- C. Arrange stone pattern to provide color uniformity and minimize visual variations, and provide a uniform blend of stone unit sizes.
- D. Fill stainless dowel holes in stone units with mortar. Align/install minimal of 2 pins per stone cap. minimum 1" of depth into cap.
- E. Assemble stone with horizontal reinforcing which spans full width of cavity.
- F. Arrange stone coursing in running bond with consistent joint width.
- G. Set stone in full mortar setting bed to fully support stone over bearing surface. Use setting buttons or shims to maintain correct joint width.
- H. As stone wall is erected, fill center of wall with air-entrained 4,000psi portland cement based concrete. Install in lifts no higher than 24". Install with rebar and horizontal reinforcing as indicated on drawings. Vibrate concrete into voids and joints in stone. Coordinate with wall control joints provide min 3/4" expansion material. Expansion material shall be a compressible closed cell filler. install full width of wall. Tooth stones past control joint, point as required, install backer rod and sealant at joint in foundation wall, stones, through cap.

3.04 REINFORCEMENT AND ANCHORAGE

- A. Install horizontal joint reinforcement 8 inches on center.
- B. Place joint reinforcement continuous in first and second joint below top of walls.
- C. Lap joint reinforcement ends minimum 6 inches.

3.05 JOINTS

- A. Leave the following joints open for sealant:
 - 1. Head joints and top joints of cap. Rake out 5/8" to 3/4". Size for backer rod and sealant joint. Consult/review sealant manufacturer data for sizing width and depth.
 - 2. Joints labeled "expansion joint or control joint".
- B. Rake out mortar joints 5/8 to 3/4 inch and brush joints clean to accommodate sealant.
- C. Pack mortar into joints and work into voids. Neatly tool surface to raked joint. Back rake joints in cavity to allow full contact with concrete fill at center of wall.

3.06 CLEANING

- A. Remove excess mortar as work progresses, and upon completion of work.
- B. Clean soiled surfaces with cleaning solution.
- C. Use non-metallic tools in cleaning operations.

3.07 PROTECTION

- A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

END OF SECTION

SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Excavating for footings and site structures.
- B. Backfill of excavated areas after foundation walls installed.

1.02 PROJECT CONDITIONS

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey bench mark and intended elevations for the work are as indicated.
- B. Refer to Cast-in-place concrete - formwork layout for requirements prior to excavation.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.
- C. Notify CM, owner and utility company to identify utilities.
- D. Protect roads bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.03 EXCAVATING

- A. Protect road and road edges from damage by equipment, excavations, trucks, etc.
- B. Excavate to accommodate concrete formwork.
- C. Notify CM of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- D. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
- E. Do not interfere with 45 degree bearing splay of foundations.
- F. Hand trim excavations. Remove loose matter.
- G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 23 23.
- H. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- I. Remove excavated material that is unsuitable for re-use from site.
- J. After concrete and formwork is complete backfill excavation with structural fill to within 12" of finish grade. Excavated material which geotechnical engineer identifies as meeting structural fill requirements may be reused. Refer to grading plans for elevations, slopes, etc.
- K. Remove excess excavated material from site.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.
- B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.
- C. Notify CM for soil inspection by geotechnical engineer. Geotechnical engineer will verify bottom of excavation is undisturbed soil and can provide appropriate bearing.

3.05 PROTECTION

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 32 92 00

TURF AND GRASSES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This section includes:
 - 1. Topsoil, seeding and mulching requirements for permanent seeding applications.
- B. Related Sections include the following:
 - 1. Section 01 57 13 "Temporary Erosion & Sediment Control" for controlling run off.
 - 2. Division 32 Section "Plants".

1.03 REFERENCE STANDARDS

- A. IDOT Standard Specifications for Road and Bridge Construction, 2007, Sections 250 "Seeding" and 251 "Mulch".

1.04 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become planting soil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.05 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for identifying source, including name and telephone number of supplier.
- C. Qualification Data: For qualified landscape Installer.
- D. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- E. Material Test Reports: For existing surface soil and imported topsoil.
- F. Planting Schedule: Indicating anticipated planting dates for each type of planting.
- G. LEED Certification Procedures: Complete forms identified in Section 01-35-15 relating to LEED certification for Credits 4.1/4.2 (recycled content) and 5.1/5.2 (extracted/harvested/manufactured within 500 miles of site).

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful seeded areas establishment.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
 - 2. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for seeded areas growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- D. Preinstallation Conference: Conduct conference at Project site.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.08 PROJECT CONDITIONS

- A. Seeding Times: Seed during one of the following periods, or at such other periods to insure proper growth to maintain applicable planting/seeding warranties/guarantees. Coordinate seeding periods with initial maintenance periods to provide required maintenance from date of seeding completion.
 - 1. Spring Seeding: mid April through the end of June.
 - 2. Fall Seeding: mid August through the end of September.
- B. Weather Limitations: Proceed with seeding only when existing and forecasted weather conditions permit.

1.09 MAINTENANCE SERVICE

- A. Initial seeded areas Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is seeded and continue until acceptable seeded areas is substantially established, and throughout the warranty period in part 1.10.

1.10 WARRANTY

- A. Contractor shall warranty the seeded areas and grasses for a period of one complete growing season from date of substantial completion, and until accepted by the Construction Manager. Completion of growing season will carry over the winter if necessary.
- B. Contractor shall repair the seeded areas and grasses as directed by the Construction Manager until the end of the warranty period.

PART 2 PRODUCTS

2.01 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

- B. Seed Species: State-certified seed of grass species as noted, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
1. Bluegrass Seeded Turf areas:
 - (a). Bluegrass Seeded Turf areas are not included in this project.
 2. Low Grow Fescue Mix:
 - (a). 60% Hard fescue (*Festuca trachyphylla*), three varieties,
15% Creeping red fescue (*Festuca rubra*, FORTITUDE),
10% Perennial rye grass (*Lolium perenne*, PROMISE),
15% Redtop (*Agrostis alba*).
 3. Fescue – Forb Swale Mix:
 - (a). 50% Hard fescue (*Festuca trachyphylla*), three varieties,
15% Creeping red fescue (*Festuca rubra*, FORTITUDE),
10% Perennial rye grass (*Lolium perenne*, PROMISE),
25% Redtop (*Agrostis alba*).

Plus

 - (b). Annual/Perennial Forbs

Forbs		PLS Seed (oz./acre)
Chamaecrista fasciculata	Partridge Pea	16.00
Coreopsis lanceolata	Sand Coreopsis	15.00
Rudbeckia hirta	Black-eyed Susan	32.00
Liatris pycnostachya	Prairie blazing star/gayfeather	12.00
Monarda fistulosa	Wild bergamot	8.00
Echinacea purpurea	Purple Coneflower	20.00
Lupinus perennis	Wild Lupine	8.00
Penstemon digitalis	Foxglove Beard Tongue	3.00
Cosmos bipinnatus	Annual Cosmos	36.00
Gaillardia pulchella	Blanket Flower	16.00
Papaver rhoeas	Annual Corn Poppy	26.00
Total oz/acre		192.00
		12.0 lb/acre

Source: Genesis Nursery Inc, (815)438-2220, or equal.

- (c). Seed Carrier: Inert material, sharp clean sand or perlite, mixed with seed at a ratio of not less than two parts seed carrier to one part seed.
4. Wet Basin Seed Mix:
 - (a). Wet Basin Seed Mix

West Basin Seed Mix		
Scientific Name	Common Name	PLS Seed - (lb./acre)
Calamagrostis Canadensis	Blue joint grass	1.0 lb.
Leersia oryzoides	Rice cut grass	1.0 lb.
Panicum virgatum	Switch grass	0.25 lb.
Spartina pectinata	Prairie cord grass	0.25 lb.
Carex vulpinoidea	Brown fox sedge	0.25 lb.
Carex scoparia	Lance-fruited oval sedge	0.13 lb.
Liatris spicata	Spiked blazing star	0.25 lb.
Veronicastrum virginicum	Culvers root	0.13 lb.
Eupatorium perfoliatum	Boneset	0.06 lb.
Iris virginica	Blue flag iris	0.50 lb.
Scirpus atrovirens	Dark Green Rush	0.06 lb.
Scirpus cyperinus	Wool Grass	0.06 lb.

	Total	3.94 lb./acre
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Source: Genesis Nursery Inc, (815)438-2220, or equal.

- (b). Cover Crop:
- | | |
|--|-------------|
| Common Oats (<i>Avena sativa</i>) | 22 lbs/acre |
| Annual Rye (<i>Lolium multiflorum</i>) | 6 lbs/acre |

2.02 TOPSOIL

- A. Topsoil: Furnishing and spreading topsoil for seeding operations will be provided separate from this contract, unless noted otherwise on plans.
- B. Topsoil: If topsoil is required, it shall meet ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension, generally free of sod, roots, clay lumps, and other extraneous materials harmful to or creating impediments to plant growth.
1. Topsoil Source:
 - a. Adequate topsoil from on-site sources will not be available.
 - b. Topsoil shall be imported or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.
 - c. Test results showing adequacy of imported topsoil meeting adequacy for nutrients (available phosphorus, exchangeable potassium, nitrogen content), pH, organics, and lime shall be provided to Owner's Representative prior to installation.
 - d. Topsoil not meeting test result criteria will be amended with inorganic and organic amendments as recommended, and retested.

2.03 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
 2. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
 3. Provide lime in form of dolomitic limestone.
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.
- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- G. Sand: Clean, washed, natural or manufactured, free of toxic materials.
- H. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.04 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8;

moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch (12.5-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
- B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
- C. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.
- D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. (2.4 kg/cu. m) of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. (4 kg/cu. m) of loose sawdust or ground bark.
- E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.05 PLANTING ACCESSORIES

- A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.

2.06 FERTILIZER

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.07 MULCHES

- A. Straw Mulch: Clean, air-dry, mildew and weed/seed free threshed straw of wheat, rye, oats, or barley.
- B. Peat Mulch: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
- C. Peat Mulch: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially

decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

- D. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 - 1. Organic Matter Content: 50 to 60 percent of dry weight.
 - 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
- E. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- F. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- G. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.08 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.
- B. Erosion Control – Mulch Blanket: Biodegradable, netless (Futerra, F4NETLESS, or approved equal), wood-fiber mat, turf green color; install per manufacturer's recommendations.
- C. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq. m), with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive seeded areas and grass for compliance with requirements and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.03 SEEDED AREAS PREPARATION

- A. Limit seeded areas subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades and Finish Grades: Loosen subgrade or finish grade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply superphosphate fertilizer directly to subgrade or finish grade before loosening.
 2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, if necessary, and apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. Mix lime with dry soil before mixing fertilizer.
 3. Spread planting soil mix to a depth of 6 inches (150 mm), if necessary, but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a. Spread approximately 1/2 the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil mix.
 - b. Reduce elevation of planting soil to allow for soil thickness of sod in areas to be sodded.
- C. Unchanged Grades: If seeded areas are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
1. Herbicide existing grass, vegetation or seeded areas.
 2. Remove existing grass, vegetation, and seeded areas. Do not mix into surface soil.
 3. Loosen surface soil to a depth of at least 6 inches (150 mm). Apply soil if necessary to bring back to final grade, soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches (100 mm) of soil. Till soil to a homogeneous mixture and fine texture.
 4. Apply superphosphate fertilizer directly to surface soil before loosening.
 5. Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
 6. Legally dispose of waste material, including grass, vegetation, and seeded areas, off Using Agency's property.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared seeded areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.04 PREPARATION FOR EROSION-CONTROL MATERIALS

- A. Prepare area as specified in "Seeded areas Preparation" Article.
- B. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.05 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
 1. Do not use wet seed or seed that is moldy or otherwise damaged.
 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 5 lb/1000 sq. ft or as indicated for the specific mix.

- C. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas on slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.
- E. Protect seeded areas on slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches (38 mm) in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
 - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- G. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a depth of 3/16 inch (4.8 mm), and roll surface smooth.

3.06 WET BASIN AND NATIVE SEED MIXES

- A. Sow seed with a spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
- B. Prior to seeding apply safe herbicide application to existing cattails. After die-back remove cattails, including root stock, off site.
- C. Sow seed, using a carrier agent, at a total rate as indicated on tables.
 - 1. Seed depth should be ¼ inch or less, brush seed and roll lightly and water with fine spray.
 - 2. Wet basin and native seed mixes shall include a cover crop seeding as noted.
- D. Within 24 hours of seeding, apply a mulch blanket to areas, installing per manufacturer's recommendations. Soak mulch blanket after installation is complete.
- E. Water newly seeded areas and keep moist until wet basin vegetation is established.

3.07 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
- B. Hydroseeding shall be conducted in a two-step process, applying mulch cover in a separate application, unless approved otherwise by the Construction Manager.
 - 1. Mix slurry with a nonasphaltic or fiber mulch tackifier per manufacturer's recommendations.
 - 2. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500 lb/acre dry weight or as recommended, and seed component is deposited at not less than the specified seed-sowing rate. Apply second, slurry cover coat of fiber mulch at a rate not less than 1,000 lb/acre or as recommended.

3.08 MAINTENANCE

- A. Maintain and establish seeded areas by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth seeded areas. Provide materials and installation the same as those used in the original installation.
 - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
- B. Watering: Provide and maintain temporary piping, hoses, and seeded areas-watering equipment or watering truck to convey water from sources and to keep seeded areas uniformly moist to a depth of 4 inches until germination.

1. Schedule and apply watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 2. After germination, water seeded areas with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- C. Mow seeded areas as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
1. Mow grass to a height of 1-1/2 to 2 inches (38 to 50 mm).
- D. Seeded areas Postfertilization: Apply fertilizer after initial mowing and when grass is dry.
1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) to seeded areas area.
 2. Wet Basin seeded areas do not require postfertilization.
- E. Contractor shall develop and maintain a maintenance and watering log, to be signed off by Construction Manager. Log shall document maintenance activities and watering, by areas and weeks during the entire maintenance period.

3.09 SATISFACTORY SEEDED AREAS

- A. Bluegrass and Fescue Turf Areas:
1. At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90% over any 10 sq. ft. and bare spots not exceeding 6 inches by 6 inches. Additionally, bare spots less than 6 inches by 6 inches, but in the aggregate represents over 10% of a 100 square foot area shall be reseeded or overseeded at the discretion of the Owner's Representative.
- B. Wet Basin and Native Grass Areas:
1. At end of maintenance period, areas shall exhibit a minimum of 75% of the seeded material, in a uniform coverage. There shall be no significant areas devoid of vegetation, or significant erosion areas.
 2. Areas shall not be dominated by invasive species, including *Phalaris arundinacea*, *Melilotus alba*, *Poa pretensis*, *Lythrum salicaria*, *Typha species*, and *Salix interior*.

3.10 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by seeded areas work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after seeded areas is established.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 32 93 00

PLANTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Trees.
 - 2. Shrubs.
 - 3. Ground Cover.
 - 4. Plants.
 - 5. Tree Stabilization.
 - 6. Edgings.
- B. Related Section:
 - 1. Division 32 Section "Turf and Grasses" for lawn and meadow planting.

1.03 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than [sizes indicated] [diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required]; wrapped, tied, rigidly supported, and drum laced as recommended by ANSI Z60.1.
- C. Bare-Root Stock: Exterior plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of exterior plant required.
- D. Clump: Where three or more young trees were planted in a group and have grown together as a single tree having three or more main stems or trunks.
- E. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of exterior plant required.
- F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted exterior plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of exterior plant.
- G. Finish Grade: Elevation of finished surface of planting soil.
- H. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- I. Multi-Stem: Where three or more main stems arise from the ground from a single root crown or at a point right above the root crown.
- J. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

- K. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- L. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each of the following:
 - 1. 5 lb of mineral mulch for each color and texture of stone required, in labeled plastic bags.
 - 2. 5 lb of decomposed granite in labeled plastic bag.
 - 3. Edging materials and accessories, of manufacturer's standard size, to verify color selected.
 - 4. Mulch material to be used for tree, shrub and perennial plantings and beds.
- C. Qualification Data: For qualified landscape Installer.
- D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis for standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- E. Material Test Reports: For existing surface soil if used, and imported topsoil.
- F. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year. Submit before expiration of required maintenance periods.
- H. Warranty: Sample of special warranty.
- I. LEED Certification Procedures: Complete forms identified in Section 01-35-15 relating to LEED certification for Credits 4.1/4.2 (recycled content), 5.1/5.2 (extracted/harvested/manufactured within 500 miles of site).

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; [sodium absorption ratio;]deleterious material; pH; and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for plant growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."
 - 1. Selection of exterior plants and materials purchased under allowances will be made by Owner's Representative, who will tag plants at their location before they are prepared for transplanting.

- E. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements at breast height (diameter at breast height, dbh). Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- F. Observation: Owner's Representative may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Owner's Representative retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 - 1. Notify Owner's Representative of sources of planting materials a minimum of two days in advance of delivery to site.
- G. Preinstallation Conference: Conduct conference at Project Site.

1.06 DELIVERY, STORAGE AND HANDLING

- A. No bare root stock will be allowed on this project unless approved in writing by Owner's representative.
- B. Do not prune trees and shrubs before delivery except as approved by Owner's Representative. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.
- C. Handle planting stock by root ball. Do not pick up or lift by stems or trunk, which may pull roots from root ball and soil.
- D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.
 - 1. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
 - 2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
 - 3. Do not remove container-grown stock from containers before time of planting.
 - 4. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.07 PROJECT CONDITIONS

- A. Planting Schedule: Plant during one of the following periods, or at such other periods to insure proper growth to maintain applicable planting/seeding warranties/guarantees. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Spring Planting: mid-April through end of June.
 - 2. Fall Planting: mid-August through end of September.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed according to manufacturer's written instructions and warranty requirements.
- C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns unless otherwise acceptable to Owner's Representative.
 - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.08 WARRANTY

- A. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - c. Faulty operation of edgings, outcrop wall.
 - 2. Warranty Periods from Date of Substantial Completion:
 - a. Trees and Shrubs: One year.
 - b. Ground Cover and Plants: One complete growing season (mid-April to end of September (5.5 months). Plants not having completed a growing season prior to dormancy, will continue the remainder of the growing season into the next season.
 - 3. Include the following remedial actions as a minimum:
 - a. Remove dead plants immediately. Replace immediately unless required to plant in the succeeding planting season.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - c. A limit of one replacement of each exterior plant will be required except for losses or replacements due to failure to comply with requirements.

1.09 MAINTENANCE SERVICE

- A. Initial Maintenance Service for Trees and Shrubs: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
 - 1. Maintenance Period: Minimum 12 months from date of planting completion or until end of warranty period.
- B. Initial Maintenance Service for Ground Cover and Plants: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
 - 1. Maintenance Period: Minimum 5 months from date of planting completion or until end of warranty period.

PART 2 PRODUCTS

2.01 TREE AND SHRUB MATERIAL

- A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Provide trees and shrubs of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Owner's Representative, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

- E. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.
- F. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.02 SHADE AND FLOWERING TREES

- A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
 - 1. Provide balled and burlapped trees.
 - 2. Branching Height: One-third to one-half of tree height, or as indicated on plans.
- B. Small Upright Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
 - 1. Stem Form: Single trunk and Multi-stem as indicated on plans.
 - 2. Provide balled and burlapped trees.
- C. Small Spreading Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
 - 1. Stem Form: Single trunk and Multi-stem as indicated on plans.
 - 2. Provide balled and burlapped trees.

2.03 DECIDUOUS SHRUBS

- A. Form and Size: Shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.
 - 1. Shrub sizes indicated are sizes after pruning.
 - 2. Provide balled and burlapped and container-grown shrubs.

2.04 CONIFEROUS EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.
- B. Form and Size: Specimen quality as described, symmetrically shaped coniferous evergreens, unless noted otherwise on the plans.
 - 1. Shearing Designation: Natural, never sheared (N).
 - a. Altered Form Configuration: None.
 - 2. Provide balled and burlapped trees.

2.05 BROADLEAF EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.
- B. Form and Size: Specimen quality as described, symmetrically shaped broadleaf evergreens, unless noted otherwise on plans.
 - 1. Shearing Designation: Natural, never sheared (N).
 - a. Altered Form Configuration: None.

2.06 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

2.07 PLANTS

- A. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

- B. Perennials and Grasses: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying with requirements in ANSI Z60.1.
- C. Vines: Provide vines of species indicated complying with requirements in ANSI Z60.1 as follows:
 1. Two-year plants with heavy, well-branched tops, with not less than 3 runners 18 inches (450 mm) or more in length, and with a vigorous well-developed root system.
 2. Provide field-grown vines. Vines grown in pots or other containers of adequate size and acclimated to outside conditions will also be acceptable.

2.08 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth.
 1. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Topsoil for planting of trees, shrubs, groundcovers, grasses and perennials will not be available on-site.
 2. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.09 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
 2. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
 3. Provide lime in form of dolomitic limestone.
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.
- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- G. Sand: Clean, washed, natural or manufactured, free of toxic materials.
- H. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.10 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 1. Organic Matter Content: 50 to 60 percent of dry weight.
 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

- B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
- C. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.
- D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
 - 1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. of loose sawdust or ground bark.
- E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.11 FERTILIZER

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- E. Starter Fertilizer: A starter fertilizer of 13-25-12 shall be utilized according to manufacturing specifications.

2.12 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
 - 1. Type: Shredded hardwood.
- B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 - 1. Organic Matter Content: 50 to 60percent of dry weight.
 - 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
- C. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:
 - 1. Type: Rounded stone, Ivory Nugget.

2. Size Range: [1-1-1/2 inches .
3. Color: Uniform tan-beige color range termed "Ivory Nugget".

2.13 WEED-CONTROL BARRIERS

- A. Polyethylene Sheeting: ASTM D 4397, black, 0.006-inch (0.15-mm) minimum thickness.
- B. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101g/sq. m) minimum.
- C. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

2.14 TREE STABILIZATION MATERIALS

- A. Stakes and Guys:
 1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
 2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.
 3. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch (2.7 mm) in diameter.
 4. Hose Chafing Guards: Reinforced rubber or plastic hose at least 1/2 inch (13 mm) in diameter, black, cut to lengths required to protect tree trunks from damage.
 5. Guy Cables: 5-strand, 3/16-inch- (4.8-mm-) diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches (75 mm) long, with two 3/8-inch (10-mm) galvanized eyebolts.
 6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.
- B. Root-Ball Stabilization Materials:
 1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated; stakes pointed at one end.
 2. Wood Screws: ASME B18.6.1.
 3. Proprietary Devices: Proprietary at- or below-grade stabilization system to secure each new planting by root ball; sized as indicated and per manufacturer's written recommendations.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Foresight Products, LLC; Duckbill Rootball Fixing System.

2.15 LANDSCAPE EDGINGS

- A. Steel Edging: Standard commercial-steel edging, rolled edge, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following: Town & Country Landscape Supply Company, (708) 596-7200.
 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Border Concepts, Inc.
 - b. Collier Metal Specialties, Inc.
 - c. Russell, J. D. Company (The).
 - d. Sure-Loc Edging Corporation.
 3. Edging Size: 3/16 inch wide by 4 inches deep
 4. Stakes: Tapered steel, a minimum of [12 inches long.
 5. Accessories: Standard tapered ends, corners, and splicers.
 6. Finish: Standard powder coat paint.
 7. Paint Color: Green.

2.16 MISCELLANEOUS PRODUCTS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- B. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 4-inch- (100-mm-) wide minimum, with stretch factor of 33 percent.
- C. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.
- D. Planter Filter Fabric: Woven or nonwoven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.

2.17 PLANTING SOIL MIX

- A. Planting Soil Mix: Mix topsoil amended as needed to meet soil test results, compost, and sand in a ratio as follows:
 - 1. 60% Topsoil, 30% Compost, 10% Sand.
 - 2. Add and mix 1 pound per 1,000 sq. ft. of commercial starter fertilizer.
- B. Planting Soil Mix for Lower-pH Sites: To existing planting mix established in A above placed in an area,
 - 1. Spread a 3" layer of sphagnum peat and mix thoroughly within the top 18", or
 - 2. Incorporate 1 lb per 10 sq. ft. of Aluminum Sulfate into existing planting mix and thoroughly mix.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner's Representative's acceptance of layout before planting. Make minor adjustments as required.
- D. Lay out exterior plants at locations directed by Owner's Representative. Stake locations of individual trees and shrubs and outline areas for multiple plantings.
- E. Trunk Wrapping: Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping. Wrap trees of 2-inch (50-mm) caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling.
- F. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
 - 1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

- G. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.03 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply slow release starter fertilizer or approved equal directly to subgrade before loosening.
 - 2. Thoroughly blend planting soil mix off-site before spreading
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. Mix lime with dry soil before mixing fertilizer, if soil test analysis requires.
 - 3. Spread planting soil mix to a depth adequate to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil mix.
- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- C. Before planting, restore planting beds if eroded or otherwise disturbed after finish grading.

3.04 EXCAVATION FOR TREES AND SHRUBS

- A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
 - 1. Excavate approximately two times as wide as ball diameter for balled and burlapped and container-grown stock.
- B. Subsoil removed from excavations may not be used as backfill.
- C. Obstructions: Notify Owner's Representative if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
 - 1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Owner's Representative if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.
- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.05 TREE AND SHRUB PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.
- B. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball minimum of 1 -2 inches above adjacent finish grades.
 - 1. Remove burlap and wire baskets from top 1/3 to 1/2 of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- C. Organic Mulching: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

- D. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling.
- E. Trunk Wrapping: Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling.

3.06 TREE AND SHRUB PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees and shrubs as directed by Owner's Representative.
- C. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Owner's Representative, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

3.07 TREE STABILIZATION

- A. Trunk Stabilization: Unless otherwise indicated, provide trunk stabilization as follows:
 1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper as measured diameter at breast height. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend at least one third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
 2. Use 2 stakes for trees up to 12 feet (3.6 m) high and 2-1/2 inches (63 mm) or less in caliper; 3 stakes for trees less than 14 feet (4.2 m) high and up to 4 inches (100 mm) in caliper. Space stakes equally around trees.
 3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
 4. Support trees with two strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
- B. Guying and Staking: Guy and stake trees exceeding 14 feet (4.2 m) in height and more than 3 inches (75 mm) in caliper unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches (760 mm) long, driven to grade.
 1. For trees more than 6 inches (150 mm) in caliper, anchor guys to pressure-preservative-treated deadmen 8 inches (200 mm) in diameter and 48 inches (1200 mm) long buried at least 36 inches (900 mm) below grade. Provide turnbuckle for each guy wire and tighten securely.
 2. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
 3. Support trees with strands of cable or multiple strands of tie wire encased in hose sections at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
 4. Attach flags to each guy wire, 30 inches (760 mm) above finish grade.
 5. Paint turnbuckles with luminescent white paint.

3.08 PLANTING IN PLANTERS

- A. Place a layer of drainage gravel at least 4 inches (100 mm) thick in bottom of planters, cover with filter fabric, and fill with planter soil mix. Place soil in lightly compacted layers to an elevation of 1-1/2 inches (38 mm) below top of planter, allowing natural settlement.

3.09 GROUND COVER, PERENNIAL AND GRASS PLANTING

- A. Set out and space ground cover and plants as indicated on plans and in notes.
- B. Dig holes large enough to allow spreading of roots and backfill with planting soil.
- C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING BED MULCHING

- A. Mulch backfilled surfaces of planting beds and other areas indicated. Provide mulch ring around trees in lawn areas.
 1. Organic Mulch: Apply 3-inch average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.
 2. Mineral Mulch: Apply 3-inch average thickness of mineral mulch, and finish level with adjacent finish grades.

3.11 EDGING INSTALLATION

- A. Steel Edging: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately 30 inches apart, driven below top elevation of edging or as indicated per manufacturer's recommendations.

3.12 PLANT MAINTENANCE

- A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, adjusting and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.
- B. Schedule and apply watering to plants, as needed, to prevent wilting, puddling, erosion and displacement of plants.
- C. Ground Cover and Plant Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.
- D. Contractor shall develop and maintain a maintenance and watering log, to be signed off by Construction Manager. Log shall document maintenance activities and watering, by areas and weeks during the entire maintenance period.

3.13 CLEANUP AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

3.14 DISPOSAL

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION