

Specifications for this project are arranged in accordance with the Construction Specification Institute numbering system and format. Section numbering is discontinuous and all numbers not appearing in the Table of Contents are not used for this Project.

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LEMUR LOOKOUT EXHIBIT  
BRANDYWINE ZOO  
1001 N. PARK DRIVE, WILMINGTON, DE 19802  
DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**BID FORM**

For Bids Due: Thursday, October 10, 2019 @ 1:00pm To: Dept. of Natural Resources and Environmental Control  
Division of Parks and Recreation  
Office of Design and Development  
89 Kings Highway, Dover DE 19901

**Name of Bidder:** \_\_\_\_\_

**Delaware Business License No.:** \_\_\_\_\_ **Taxpayer ID No.:** \_\_\_\_\_  
(A copy of Bidder's Delaware Business License must be attached to this form.)

**(Other License Nos.):** \_\_\_\_\_

**Phone Number:** ( ) \_\_\_\_\_ **Fax Number:** ( ) \_\_\_\_\_

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ \_\_\_\_\_

(\$ \_\_\_\_\_ )

**Rock Removal Allowance:**

**50 CY x Unit Price \$ \_\_\_\_\_ /Unit of Measure = \$ \_\_\_\_\_ Amount**

**Total Bid:**

\$ \_\_\_\_\_

(\$ \_\_\_\_\_ )

LEMUR LOOKOUT EXHIBIT  
BRANDYWINE ZOO  
1001 N. PARK DRIVE, WILMINGTON, DE 19802  
DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**BID FORM**

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An “ADD” or “DEDUCT” amount is indicated by the crossed out part that does not apply.

ALTERNATE No. 1: Kick-rail as shown on Landscape Documents Base Bid: No kick-rail. Alternate: ADD: Kick-rail.

Add/Deduct: \_\_\_\_\_  
(\$ \_\_\_\_\_ )

No. of Days to Complete Alternate 1: \_\_\_\_\_

ALTERNATE No. 2: Site Pavement on Exhibit Loop as shown on Landscape Documents. Base Bid: Asphalt Walkways. Alternate: ADD Concrete Pavement.

Add/Deduct: \_\_\_\_\_  
(\$ \_\_\_\_\_ )

No. of Days to Complete Alternate 2: \_\_\_\_\_

LEMUR LOOKOUT EXHIBIT  
 BRANDYWINE ZOO  
 1001 N. PARK DRIVE, WILMINGTON, DE 19802  
 DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**BID FORM**

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

		DEDUCT	ADD
UNIT PRICE No. 1:	Description: Provide cost per linear feet to procure and install Viewrail as shown on detail 1/ ST700	\$	\$
		_____	_____
UNIT PRICE No. 2	Description: Provide cost per linear feet to procure and install Exclusion Fence as shown on detail 6/ ST700	\$	\$
		_____	_____
UNIT PRICE No. 3	Description: Provide cost per linear feet to procure and install Boma Fence as shown on detail 7/ ST700	\$	\$
		_____	_____
UNIT PRICE No. 4	Description: Provide cost per linear feet to procure and install Kickrail as shown on detail 1/ ST703	\$	\$
		_____	_____
UNIT PRICE No. 5	Description: Provide cost per linear feet to procure and install Guardrail as shown on detail 4/ ST703	\$	\$
		_____	_____
UNIT PRICE No. 6	Description: Provide cost per linear feet to procure and install Handrail as shown on detail 7/ ST703	\$	\$
		_____	_____

UNIT PRICE No. 7	Description: Provide cost per linear feet to procure and install USDA Perimeter Fence as shown on detail 8/ ST703	\$	\$
UNIT PRICE No. 8	Description: Provide cost per ton to procure and install boulders (2'-6" x 2'-6" min).	\$	\$
UNIT PRICE No. 9	Description: Provide cost per cubic yard to procure and install double shredded mulch as specified in 32 93 00 Planting.	\$	\$
UNIT PRICE No. 10	Description: Provide cost per square yard to install Concrete Paving as shown on Civil drawings	\$	\$
UNIT PRICE No. 11	Description: Provide cost per square yard to install Asphalt Paving as shown on Civil drawings	\$	\$
UNIT PRICE No. 12	Description: Removal of unsatisfactory soil and replacement with satisfactory structural fill material according to Section 31 20 00.	\$	\$
UNIT PRICE No. 13	Description: Removal of unsatisfactory soil and replacement with satisfactory fill under walkways according to Section 31 20 00.	\$	\$
<b>UNIT PRICE No. 14</b>	<b>Description: Provide cost per cubic yard for excavation for rock/boulders one (1) cubic yard and larger in volume, including all necessary equipment and relocation of rock/boulders.</b>	\$	\$

LEMUR LOOKOUT EXHIBIT  
BRANDYWINE ZOO  
1001 N. PARK DRIVE, WILMINGTON, DE 19802  
DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**BID FORM**

I/We acknowledge Addendums numbered \_\_\_\_\_ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within \_\_\_\_\_ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By \_\_\_\_\_ Trading as \_\_\_\_\_  
(Individual's/General Partner's /Corporate Name)

\_\_\_\_\_  
(State of Corporation)

Business Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Witness: \_\_\_\_\_ By: \_\_\_\_\_  
(Seal) (Authorized Signature)

\_\_\_\_\_  
(Title)

Date: \_\_\_\_\_

**ATTACHMENTS**

- Sub-Contractor List
- Non-Collusion Statement
- Affidavit of Employee Drug Testing Program
- Bid Security
- (Others as Required by Project Manual)

LEMUR LOOKOUT EXHIBIT  
 BRANDYWINE ZOO  
 1001 N. PARK DRIVE, WILMINGTON, DE 19802  
 DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**BID FORM**

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.** This form must be filled out completely with no additions or deletions.

	Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax payer ID # or Delaware Business license #
1.	Sitework	_____	_____	_____
		_____	_____	_____
2a.	<i>Paving</i>	_____	_____	_____
		_____	_____	_____
2b.	<i>Hardscape</i>	_____	_____	_____
		_____	_____	_____
3.	Landscape	_____	_____	_____
		_____	_____	_____
4.	Masonry	_____	_____	_____
		_____	_____	_____
5.	Doors, Frames & Hardware	_____	_____	_____
		_____	_____	_____
6.	Painting	_____	_____	_____
		_____	_____	_____
7.	Concrete	_____	_____	_____
		_____	_____	_____
8.	Heavy Timber	_____	_____	_____
		_____	_____	_____
9.	Roofing	_____	_____	_____
		_____	_____	_____

10. Electrical	_____	_____	_____
	_____	_____	_____
11. Mechanical	_____	_____	_____
	_____	_____	_____
12. Plumbing	_____	_____	_____
	_____	_____	_____
13. Site Utilities	_____	_____	_____
	_____	_____	_____
14. Exhibit Enclosure	_____	_____	_____
	_____	_____	_____
15. Fencing	_____	_____	_____
	_____	_____	_____
16. Exhibit Rockwork	_____	_____	_____
	_____	_____	_____

LEMUR LOOKOUT EXHIBIT  
BRANDYWINE ZOO  
1001 N. PARK DRIVE, WILMINGTON, DE 19802  
DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**BID FORM**

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date to the Office of Design and Development, Division of Parks and Recreation, DNREC.

All the terms and conditions of the Lemur Lookout Exhibit have been thoroughly examined and are understood.

**NAME OF BIDDER** \_\_\_\_\_

**AUTHORIZED REPRESENTATIVE (TYPED):** \_\_\_\_\_

**AUTHORIZED REPRESENTATIVE (SIGNATURE):** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**ADDRESS OF BIDDER:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**E-MAIL:** \_\_\_\_\_

**PHONE NUMBER:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ of 20  
\_\_\_\_\_.

My commission expires \_\_\_\_\_ NOTARY PULIC \_\_\_\_\_

**THIS PAGE MUST BE SIGNED AND NOTORIZED FOR YOUR BID TO BE CONSIDERED.**

LEMUR LOOKOUT EXHIBIT  
BRANDYWINE ZOO  
1001 N. PARK DRIVE, WILMINGTON, DE 19802  
DIVISION OF PARKS AND RECREATION CONTRACT No. 2019-WB-100

**AFFIDAVIT  
OF  
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors that complies with this regulation:

**Contractor/Subcontractor Name:** \_\_\_\_\_

**Contractor/Subcontractor Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Authorized Representative (typed or printed):** \_\_\_\_\_

**Authorized Representative (signature):** \_\_\_\_\_

**Title:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

My Commission expires \_\_\_\_\_. NOTARY PUBLIC \_\_\_\_\_.

**THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.**



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## **SECTION 01 10 00 - SUMMARY**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work under separate contract.
4. Allowances.
5. Alternates.
6. Unit Prices.
7. Applications for Payment.
8. Owner Supplied Construction Documents.
9. Coordination.
10. Phased construction.
11. Access to site.
12. Coordination with occupants.
13. Work restrictions.
14. Specification and drawing conventions.
15. Field Engineering.
16. References and Standards.
17. Miscellaneous provisions.

- B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### **1.3 PROJECT INFORMATION**

- A. Project Identification: Brandywine Zoo Lemur Lookout Exhibit

1. Project Location: 1001 N. Park Drive, Wilmington 19802.

- B. Owner: State of Delaware, Division of Natural Resources and Environmental Control, Parks and Recreation, 89 Kings Highway, Dover DE 19901.

- C. Architect/Engineer’s Identification: The Contract Documents, dated May 3, 2019, were prepared for this Project by GWWO Architects, 800 Wyman Park Drive Suite 300, Baltimore, MD 21211.

#### 1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:

- 1. Construction of a new zoo exhibit enclosure (2,400 GSF), visitor paths, and keeper and animal holding building (16500 GSF). The building holds animals on the ground floor while the public is able to walk directly on to the first floor to view the animals. The first floor is mainly open with a covered heavy timber structured roof.

- B. Type of Contract:

- 1. Project will be constructed under a single, lump sum prime contract.

#### 1.5 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts as it will have an impact on the General Contractor’s scope of work. The General Contractor shall allow the separate contractors access to scaffolding and/or high reaches.

- 1. Demolition of adjacent site buildings and structures anticipated to occur by others prior to construction of this Project.
- 2. Items noted “NIC” (Not in Contract) will be furnished and installed by others.

#### 1.6 ALTERNATES

- A. Alternates quoted in the Bid Form will be exercised as Owner option. Accepted alternates will be listed in the Owner-Contractor agreement.

- B. Coordinate related work and modify surrounding work affected by accepted alternates as required to complete the Work.

- C. Schedule of Alternates: Refer to Section 012300 Alternates.

#### 1.7 UNIT PRICES

- A. Unit Prices quoted on the Bid form will be exercised as Owner option.

- B. Coordinate related work and modify surrounding work affected by accepted unit prices as required to complete the Work.

- C. Schedule of Unit Prices: Refer to Section 012200 Unit Prices.

#### 1.8 APPLICATIONS FOR PAYMENT

- A. Submit three (3) originals of each application under procedures of Section 012900 Payment Procedures.
- B. Content and Format: Use the Project Manual table of contents to develop the Schedule of Values.

#### 1.9 OWNER SUPPLIED CONSTRUCTION DOCUMENTS

- A. The Contractor will be furnished, free of charge, five (5) copies of the drawings and Project Manuals (or less if requested). Additional sets will be furnished at the cost of reproduction, postage and handling.

#### 1.10 COORDINATION

- A. Coordinate Work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical, electrical and plumbing work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas (except as otherwise shown), conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Execute cutting and patching to integrate elements of Work, uncover ill-timed defective and non-conforming work, provide openings for penetrations of existing surfaces, and provide samples for testing. Seal penetrations through floors, walls, and ceilings.

#### 1.11 ACCESS TO SITE

- A. General: Contractor shall have full use of Lemur Lookout Exhibit site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

- B. Use of Site: Limit use of Project site to areas within the Contract limits. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Limits: Confine construction operations to the areas as indicated. The surrounding site is occupied and the Owner's operations shall not be disturbed.
  - 2. Driveways, Walkways and Entrances: Keep public roads, public parking, driveways and entrances outside of the work area serving premises clear and available to Owner, Owner's employees, emergency vehicles and general public at all times. Do not use these areas for parking or storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
  - 3. The adjacent building areas, site and properties are occupied and shall not be disturbed.

#### 1.12 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy adjacent site, buildings, and roadways during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, entrances, corridors, stairs and other adjacent occupied or used facilities. Do not close or obstruct walkways, entrances, stairs, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction. Entrances shall be open for the Owner's use at all times.
  - 2. Barricade work areas to keep the public from entering.
  - 3. Notify Owner not less than one week in advance of activities that will affect Owner's operations.

#### 1.13 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
  - 2. Refer to Section 011400 "Work Restrictions" for additional requirements.
- B. On-Site Work Hours: Limit work to the site and/or existing building to normal business working hours of 7:30 a.m. to 4:30 p.m., Monday through Friday, unless otherwise indicated.
  - 1. Weekend Hours: Weekend work shall not be allowed unless preapproved by the Owner.
  - 2. Early Morning Hours: Early morning hours are not allowed unless required for utility shut downs.

- C. Noise, Vibration, and Odors: Coordinate operations that may result in any level of noise and vibration, odors, or other disruption to the occupancy or use of adjacent occupied areas, the buildings and adjacent properties with the Owner.
  - 1. Notify Architect and Owner not less than seven (7) days in advance of proposed disruptive operations.
  - 2. Obtain Architect's and/or Owner's written permission before proceeding with disruptive operations.
- D. Nonsmoking Campus and Building: Smoking is prohibited within the boundaries of all state workplaces including all buildings, facilities, indoor and outdoor spaces and all the surrounding grounds owned by the State. This policy also includes but is not limited to parking lots, walkways, State vehicles and private vehicles parked or operated on State workplace property.

#### 1.14 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

#### 1.15 FIELD ENGINEERING

- A. Provide field engineering services; establish grades, lines, and levels, by use of recognized engineering survey practices.
- B. Control datum for survey is that shown on drawings. Locate and protect control and reference points.

1.16 REFERENCES AND STANDARDS

- A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Bid date, except when a specific date is specified.
- C. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

1.17 MISCELLANEOUS PROVISIONS

A. SCHEDULE

- 1. The following is the required schedule for this work:
  - a. Bids Due: **October 10, 2019 at 1:00 pm**
  - b. Notice of Building Contract Award: Within thirty (30) days of receipt and acceptance of qualified low bid.
  - c. Purchase Order Issuance: The issuance of a State of Delaware purchase order is contingent upon the successful Contractor submitting bonds on State-approved forms, signed contracts and insurance certificates to the State of Delaware within 20 days of Notice of Award. A purchase order will be issued in approximately thirty days after these items have been submitted to the State of Delaware.
  - d. On-Site Mobilization: Upon receipt of State of Delaware purchase order.
  - e. Substantial Completion: The work shall be completed shall be completed **seven months** from on-site start of work.
  - f. Completion of Punch List: 21 days from date of substantial completion.
    - 1) Refer to the General Requirements for additional details.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

**END OF SECTION 01 10 00**

## **SECTION 01 22 00 - UNIT PRICES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Sections include the following:
  - 1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
  - 2. Division 1 Section "Payment Procedures" procedures for measurement and payment.
  - 3. (Note: Reference all sections that are referenced by the request for unit prices.)

#### **1.3 DEFINITIONS**

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

#### **1.4 PROCEDURES**

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

### **PART 2 - PRODUCTS (Not Used)**

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

		DEDUCT	ADD
UNIT PRICE No. 1:	Description: Provide cost per linear feet to procure and install Viewrail as shown on detail 1/ ST700	\$	\$
UNIT PRICE No. 2	Description: Provide cost per linear feet to procure and install Exclusion Fence as shown on detail 6/ ST700	\$	\$
UNIT PRICE No. 3	Description: Provide cost per linear feet to procure and install Boma Fence as shown on detail 7/ ST700	\$	\$
UNIT PRICE No. 4	Description: Provide cost per linear feet to procure and install Kickrail as shown on detail 1/ ST703	\$	\$
UNIT PRICE No. 5	Description: Provide cost per linear feet to procure and install Guardrail as shown on detail 4/ ST703	\$	\$
UNIT PRICE No. 6	Description: Provide cost per linear feet to procure and install Handrail as shown on detail 7/ ST703	\$	\$
UNIT PRICE No. 7	Description: Provide cost per linear feet to procure and install USDA Perimeter Fence as shown on detail 8/ ST703	\$	\$

UNIT PRICE No. 8	Description: Provide cost per ton to procure and install boulders (2’-6” x 2’-6” min).	\$	\$	
UNIT PRICE No. 9	Description: Provide cost per cubic yard to procure and install double shredded mulch as specified in 32 93 00 Planting.	\$	\$	
UNIT PRICE No. 10	Description: Provide cost per square yard to install Concrete Paving as shown on Civil drawings	\$	\$	
UNIT PRICE No. 11	Description: Provide cost per square yard to install Asphalt Paving as shown on Civil drawings	\$	\$	
UNIT PRICE No. 12	Description: Removal of unsatisfactory soil and replacement with satisfactory structural fill material <i>per cubic yard</i> according to Section 31 20 00.	\$	\$	
UNIT PRICE No. 13	Description: Removal of unsatisfactory soil and replacement with satisfactory fill <i>per cubic yard</i> under walkways according to Section 31 20 00.	\$	\$	
<b>UNIT PRICE No. 14</b>	<b>Description: Provide cost per cubic yard for excavation for rock/boulders one (1) cubic yard and larger in volume, including all necessary equipment and relocation of rock/boulders.</b>	\$	\$	

**END OF SECTION 01 22 00**

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## **SECTION 01 23 00 - ALTERNATES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for alternates.

#### **1.3 DEFINITIONS**

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

#### **1.4 PROCEDURES**

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

**3.1 SCHEDULE OF ALTERNATES:**

- A. ALTERNATE No. 1: Kick-rail as shown on Landscape Documents Base Bid: No kick-rail. Alternate: ADD: Kick-rail.**
  
- B. ALTERNATE No. 2: Site Pavement on Exhibit Loop as shown on Landscape Documents. Base Bid: Asphalt Walkways. Alternate: ADD Concrete Pavement.**

**END OF SECTION 01 23 00**

## **SECTION 03 37 13 - SHOTCRETE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes shotcrete applied by the wet-mix process.

#### **1.3 DEFINITIONS**

- A. Shotcrete: Mortar or concrete pneumatically projected onto a surface at high velocity.
- B. Dry-Mix Shotcrete: Shotcrete with most of the water added at nozzle.
- C. Wet-Mix Shotcrete: Shotcrete with ingredients, including mixing water, mixed before introduction into delivery hose.

#### **1.4 SUBMITTALS**

- A. Product Data: For manufactured materials and products including reinforcement and forming accessories, shotcrete materials, admixtures, and curing compounds.
- B. Shop Drawings: For details of fabricating, bending, and placing reinforcement. Include support and anchor details, number and location of splices, and special reinforcement required for openings through shotcrete structures. Provide Engineering calculations and professionally sealed drawings by a licensed engineer within project site jurisdiction for all work involving structural reinforcing.
- C. Samples: Approximately 24 by 24 by 2 inches, to illustrate quality of finishes, colors, and textures of exposed surfaces of shotcrete.
- D. Design Mixes: For each shotcrete mix.
- E. Material Test Reports: For shotcrete materials.
- F. Material Certificates: For each material item, signed by manufacturers.

## 1.5 QUALITY ASSURANCE

- A. **Installer Qualifications:** A qualified installer employing nozzle operators who attain mean core grades not exceeding 2.5, according to ACI 506.2, on preconstruction tests.
- B. **Testing Agency Qualifications:** Independent and qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. **Comply with provisions of the following, unless more stringent requirements are indicated:**
  - 1. ACI 301, "Specification for Structural Concrete."
  - 2. ACI 506.2, "Specification for Shotcrete."
  - 3. CRSI's "Manual of Standard Practice."
- D. **Preconstruction Testing Service:** Hire a qualified independent testing agency to perform preconstruction testing and inspections indicated below:
  - 1. Produce test panels before shotcrete placement according to requirements in ACI 506.2 and ASTM C 1140 for each design mix, shooting orientation, and nozzle operator. Produce test panels with dimensions of 60 by 60 inches minimum and of average thickness of shotcrete, but not less than 4 inches. From each test panel, testing agency will obtain six test specimens: one set of three specimens unreinforced and one set of three specimens reinforced. Agency will perform the following:
    - a. Test each set of unreinforced specimens for compressive strength according to ASTM C 42.
    - b. Visually inspect each set of reinforced shotcrete cores taken from test panels and determine mean core grades according to ACI 506.2.
- E. **Mockups:** Before installing shotcrete, construct mockups for each finish required and for each design mix, shooting orientation, and nozzle operator to demonstrate aesthetic effects and set quality standard for installation.
- F. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

## 1.6 PROJECT CONDITIONS

- A. **Cold-Weather Shotcreting:** Protect shotcrete work from physical damage or reduced strength caused by frost, freezing, or low temperatures according to ACI 306.1 and as follows:

1. Discontinue shotcreting when ambient temperature is 40 deg F and falling. Uniformly heat water and aggregates before mixing to obtain a shotcrete shooting temperature of not less than 50 deg F and not more than 90 deg F.
  2. Do not use frozen materials or materials containing ice or snow.
  3. Do not place shotcrete on frozen surfaces or surfaces containing frozen materials.
  4. Do not use calcium chloride, salt, and other materials containing antifreeze agents.
- B. Hot-Weather Shotcreting: Mix, place, and protect shotcrete according to ACI 305R when hot-weather conditions and high temperatures would seriously impair quality and strength of shotcrete, and as follows:
1. Cool ingredients before mixing to maintain shotcrete temperature at time of placement below 100 deg F for wet mix.
  2. Decrease temperature of reinforcing steel and receiving surfaces below 100 deg F before shotcreting.

## PART 2 - PRODUCTS

### 2.1 FORM MATERIALS

- A. Forms: Form-facing panels that will provide continuous, straight, smooth, concrete surfaces. Furnish panels in largest practicable sizes to minimize number of joints.

### 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615/A Grade 60 , deformed.
- B. Plain-Steel Wire: ASTM A 82.
- C. Plain-Steel-Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel-Welded Wire Fabric: ASTM A 497, flat sheet.
- E. Supports: Bolsters, chairs, spacers, ties, and other devices for spacing, supporting, and fastening reinforcing steel in place according to CRSI's "Manual of Standard Practice" and as follows:
1. For uncoated reinforcement, use CRSI Class 1, plastic-protected
- F. Reinforcing Anchors: ASTM A 36/A unheaded rods or ASTM A 307, Grade A, hex-head bolts; carbon steel; and carbon-steel nuts.

### 2.3 SHOTCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I. Use only one brand and type of cement for Project.
- B. Blended Hydraulic Cement: ASTM C 595, Type IS.
- C. Silica Fume: ASTM C 1240, amorphous silica.
- D. Normal-Weight Aggregates: ASTM C 33, from a single source.
- E. Lightweight Aggregates: ASTM C 330.
- F. Water: Potable, complying with ASTM C 94, free from deleterious materials that may affect color stability, setting, or strength of shotcrete.
- G. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in shotcrete, complying with ASTM C 1116, Type III, not less than 3/4 inch long.
- H. Ground Wire: High-strength steel wire, 0.8 to 1 mm in diameter.

### 2.4 CHEMICAL ADMIXTURES

- A. General: ASTM C 1141, Class A or B, but limited to the following admixture materials. Provide admixtures for wet-mix shotcrete that contains not more than 0.1 percent chloride ions. Certify compatibility of admixtures with each other and with other cementitious materials.
  - 1. Air-Entraining Admixture: ASTM C 260.
  - 2. Water-Reducing Admixture: ASTM C 494, Type A.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
  - 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
  - 5. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
  - 6. Accelerating Admixture: ASTM C 494, Type C.

### 2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.

## 2.6 SHOTCRETE MIXES, GENERAL

- A. Prepare design mixes for each type and strength of shotcrete.
- B. Limit water-soluble chloride ions to maximum percentage by weight of cement or cementitious materials permitted by ACI 301.
- C. Admixtures: When included in shotcrete design mixes, use admixtures and retarding admixtures according to manufacturer's written instructions.
- D. Synthetic Fiber: Uniformly disperse in shotcrete mix, according to manufacturer's written instructions, at a rate of 5 lb/cu. yd.
- E. Design-Mix Adjustments: Subject to compliance with requirements, shotcrete design-mix adjustments may be proposed when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant.

## 2.7 NORMAL-WEIGHT SHOTCRETE MIXES

- A. Proportion wet mixes according to ACI 211.1 and ACI 301, using materials to be used on Project, to provide normal-weight shotcrete with the following properties:
  - 1. Water / Cement ratio = 0.40 (Maximum)
  - 2. Compressive Strength (28 Days) 4000 psi .
  - 3. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight, wet-mix shotcrete having an air content before pumping of 7percent with a tolerance of plus or minus 1-1/2 percent.

## 2.8 LIGHTWEIGHT SHOTCRETE MIXES

- A. Proportion wet mixes according to ACI 211.2 and ACI 301, using materials to be used on Project, to provide lightweight shotcrete with the following properties:
  - 1. Compressive Strength (28 Days): 4000 psi .
  - 2. Add air-entraining admixture at manufacturer's prescribed rate to result in lightweight wet-mix shotcrete having an air content before pumping of 7 percent with a tolerance of plus or minus 1-1/2 percent.

## 2.9 SHOTCRETE EQUIPMENT

- A. Mixing Equipment: Capable of thoroughly mixing shotcrete materials in sufficient quantities to maintain continuous placement.
- B. Dry-Mix Delivery Equipment: Capable of discharging aggregate-cement mixture into delivery hose under close control and maintaining continuous stream of uniformly mixed materials at required velocity to discharge nozzle. Equip discharge nozzle with manually operated water-injection system for directing even distribution of water to aggregate-cement mixture.
  - 1. Provide uniform, steady supply of clean, compressed air to maintain constant nozzle velocity while simultaneously operating blow pipe for cleaning away rebound.
  - 2. Provide water supply with uniform pressure at discharge nozzle to ensure uniform mixing with aggregate-cement mix. Provide water pump to system if line water pressure is inadequate.
- C. Wet-Mix Delivery Equipment: Capable of discharging aggregate-cement-water mixture accurately, uniformly, and continuously.

## 2.10 BATCHING AND MIXING

- A. Dry-Mix Process: Measure mix proportions by weight batching according to ASTM C 94 or by volume batching complying with ASTM C 685 requirements.
  - 1. In volume batching, adjust fine-aggregate volume for bulking. Test fine-aggregate moisture content at least once daily to determine extent of bulking.
  - 2. Prepackaged shotcrete materials may be used at Contractor's option. Predampen prepackaged shotcrete materials and mix before use.
- B. Wet-Mix Process: Measure, batch, mix, and deliver shotcrete according to ASTM C 94 and furnish batch ticket information.
  - 1. Comply with ASTM C 685 when shotcrete ingredients are delivered dry and proportioned and mixed on-site.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Concrete or Masonry: Before applying shotcrete, remove unsound or loose materials and contaminants that may inhibit shotcrete bonding. Chip or scarify areas to be repaired to extent necessary to provide sound substrate. Cut edges square and 3/4 inch deep at perimeter of work, tapering remaining shoulder at 1:1 slope into cavity to eliminate square shoulders. Dampen surfaces before shotcreting.
  - 1. Abrasive blast or hydroblast existing surfaces that do not require chipping to remove paint, oil, grease, or other contaminants and to provide roughened surface for proper shotcrete bonding.
- B. Earth: Compact and trim to line and grade before placing shotcrete. Do not place shotcrete on frozen surfaces. Dampen surfaces before shotcreting.
- C. Rock: Clean rock surfaces of loose materials, mud, and other foreign matter that might weaken shotcrete bonding.
- D. Steel: Clean steel surfaces by abrasive blasting according to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

### 3.2 FORMS

- A. General: Design, erect, support, brace, and maintain forms, according to ACI 301, to support shotcrete and construction loads and to facilitate shotcreting. Construct forms so shotcrete members and structures are secured to prevent excessive vibration or deflection during shotcreting.
  - 1. Fabricate forms to be readily removable without impact, shock, or damage to shotcrete surfaces and adjacent materials.
  - 2. Construct forms to required sizes, shapes, lines, and dimensions using ground wires and depth gages to obtain accurate alignment, location, and grades in finished structures. Construct forms to prevent mortar leakage but permit escape of air and rebound during shotcreting. Provide for openings, offsets, blocking, screeds, anchorages, inserts, and other features required in the Work.

- B. Form openings, chases, recesses, bulkheads, keyways, and screeds in formwork. Determine sizes and locations from trades providing such items. Accurately place and securely support items built into forms.

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that weaken shotcrete bonding.
- C. Securely embed reinforcing anchors into existing substrates, located as required.
- D. Accurately position, support, and rigidly secure reinforcement against displacement by formwork, construction, or shotcreting. Locate and support reinforcement by metal chairs, runners, bolsters, spacers, and hangers, as required.
- E. Place reinforcement to obtain minimum coverages for shotcrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during shotcreting. Set wire ties with ends directed into shotcrete, not toward exposed shotcrete surfaces.
- F. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### 3.4 JOINTS

- A. Construction / Control Joints: Locate and install construction joints at locations shown on drawings. Continue reinforcement through construction joints, unless otherwise indicated.

### 3.5 ALIGNMENT CONTROL

- A. Ground Wires: Install ground wires to establish thickness and planes of shotcrete surfaces. Install ground wires at corners and offsets not established by forms. Pull ground wires taut and position adjustment devices to permit additional tightening.

### 3.6 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by shotcrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

### 3.7 APPLICATION

- A. Apply temporary protective coverings and protect adjacent surfaces against deposit of rebound and overspray or impact from nozzle stream.
- B. Moisten wood forms immediately before placing shotcrete where form coatings are not used.
- C. Apply shotcrete according to ACI 506.2.
- D. Deposit shotcrete continuously in multiple passes, to required thickness, without cold joints and laminations developing. Place shotcrete with nozzle held perpendicular to receiving surface. Begin shotcreting in corners and recesses.
  - 1. Remove and dispose of rebound and overspray materials during shotcreting to maintain clean surfaces and to prevent rebound entrapment.
- E. Maintain reinforcement in position during shotcreting. Place shotcrete to completely encase reinforcement and other embedded items. Maintain steel reinforcement free of overspray and prevent build-up against front face during shotcreting.
- F. Do not place subsequent lifts until previous lift of shotcrete is capable of supporting new shotcrete.
- G. Do not permit shotcrete to sag, slough, or dislodge.
- H. Remove hardened overspray, rebound, and laitance from shotcrete surfaces to receive additional layers of shotcrete; dampen surfaces before shotcreting.
- I. Do not disturb shotcrete surfaces before beginning finishing operations.
- J. Remove ground wires or other alignment control devices after shotcrete placement.
- K. Shotcrete Core Grade: Apply shotcrete to achieve mean core grades not exceeding 2.5 according to ACI 506.2, with no single core grade exceeding 3.0.
- L. Installation Tolerances: Place shotcrete without exceeding installation tolerances permitted by ACI 117R, increased by a factor of 2.

### 3.8 SURFACE FINISHES

- A. Broom Finish: Rough-textured finish obtained by screeding exposed face of shotcrete to required plane by rod, cutting screed, or trowel, and brooming after initial set.

### 3.9 CURING

- A. Protect freshly placed shotcrete from premature drying and excessive cold or hot temperatures.
- B. Start initial curing as soon as free water has disappeared from shotcrete surface after placing and finishing.
- C. Curing Exposed Surfaces: Cure shotcrete by the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for at least seven days with water, continuous water-fog spray, water-saturated absorptive covers, or moisture-retaining covers. Lap and seal sides and ends of covers.
- D. Curing Formed Surfaces: Cure formed shotcrete surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

### 3.10 FORM REMOVAL

- A. Forms not supporting weight of shotcrete may be removed after curing at not less than 50 deg F for 24 consecutive hours after gunning, provided shotcrete is hard enough not to be damaged by form-removal operations and provided curing and protecting operations are maintained.
  - 1. Leave forms supporting weight of shotcrete in place until shotcrete has attained design compressive strength. Determine compressive strength of in-place shotcrete by testing representative field-cured specimens of shotcrete.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing materials are unacceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

### 3.11 FIELD QUALITY CONTROL

- A. Hire a qualified independent testing agency to sample materials, visually grade cores, perform tests, and submit reports during shotcreting.

- B. Air Content: ASTM C 173, volumetric method or ASTM C 231, pressure method; 1 test for each compressive-strength test for each mix of air-entrained, wet-mix shotcrete measured before pumping.
- C. Shotcrete Temperature: ASTM C 1064; 1 test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and 1 test for each set of compressive-strength specimens.
- D. Test Panels: Make a test panel, reinforced as in structure, for each shotcrete mix and for each workday or for every 50 cu. yd. of shotcrete placed, whichever is less. Produce test panels with dimensions of 24 by 24 inches minimum and of average thickness of shotcrete, but not less than 4-1/2 inches. From each test panel, testing agency will obtain six test specimens: one set of three specimens unreinforced and one set of three specimens reinforced.
  - 1. Test each set of unreinforced specimens for compressive strength according to ASTM C 1140 and construction testing requirements in ACI 506.2.
  - 2. Visually inspect each set of reinforced shotcrete cores taken from test panels and determine mean core grades according to ACI 506.2.
- E. In-Place Shotcrete: Take a set of 3 unreinforced cores for each mix and for each workday or for every 50 cu. yd. of shotcrete placed, whichever is less. Test cores for compressive strength according to ACI 506.2 and ASTM C 42. Do not cut steel reinforcement.
- F. Strength of shotcrete will be considered satisfactory when mean compressive strength of each set of 3 unreinforced cores equals or exceeds 85 percent of specified compressive strength, with no individual core less than 75 percent of specified compressive strength.
  - 1. Mean compressive strength of each set of 3 unreinforced cubes shall equal or exceed design compressive strength with no individual cube less than 88 percent of specified compressive strength.

### 3.12 REPAIRS

- A. Remove and replace shotcrete that is delaminated or exhibits laminations, voids, or sand/rock pockets exceeding limits for specified core grade of shotcrete.
  - 1. Remove unsound or loose materials and contaminants that may inhibit bond of shotcrete repairs. Chip or scarify areas to be repaired to extent necessary to provide sound substrate. Cut edges square and 1 inch deep at perimeter of work, tapering remaining shoulder at 1:1 slope into cavity to eliminate square shoulders. Dampen surfaces and apply new shotcrete.

- B. Repair core holes from in-place testing according to repair provisions in ACI 301 and match adjacent finish, texture, and color.

### 3.13 CLEANING

- A. Remove and dispose of rebound and overspray materials from final shotcrete surfaces and areas not intended for shotcrete placement.

END OF SECTION

## **SECTION 07 54 19 - PVC THERMOPLASTIC SINGLE-PLY ROOFING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Adhered system with PVC thermoplastic roofing membrane.
- B. Cover board.
- C. Pedestal paver system.

#### **1.2 REFERENCE STANDARDS**

- A. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
- B. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- C. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.
- D. FM (AG) - FM Approval Guide.
- E. NRCA (RM) - The NRCA Roofing Manual.

#### **1.3 SUBMITTALS**

- A. Product Data: Provide manufacturer's written information listed below.
  - 1. Product data indicating membrane materials, flashing materials, surfacing, fasteners, and membrane adhesive, paver pedestals, and pavers.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements.
- B. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Warranty:
  - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
  - 2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section:
  - 1. With minimum five (5) years documented experience.
  - 2. Approved by membrane manufacturer.
- C. Single Source Responsibility: Provide and install products from single source.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.

#### 1.6 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 94 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

#### 1.7 WARRANTY

- A. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 20 years after installation.
- B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
  - 1. Warranty Term: 20 years.
  - 2. For repair and replacement include costs of both material and labor in warranty.
  - 3. Exceptions NOT Permitted:
    - a. Damage due to roof traffic.
    - b. Damage due to wind of speed greater than 56 mph but less than 90 mph.
- C. ***Overburden warranty to include removal and replacement of paver system and components must be provided.***

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Carlisle SynTec: [www.carlisle-syntec.com/#sle](http://www.carlisle-syntec.com/#sle). Or approved equal.

### 2.2 ROOFING APPLICATIONS

- A. PVC Membrane Roofing: One ply membrane, fully adhered, over insulation.
- B. Roofing Assembly Performance Requirements and Design Criteria:

### 2.3 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane:
  - 1. Material: Polyvinyl chloride (PVC) complying with ASTM D4434/D4434M.
  - 2. Reinforcing: Internal fabric.
  - 3. Thickness: 60 mils (0.060 inch), minimum.
  - 4. Sheet Width: Factory fabricated into largest sheets possible.
  - 5. Color: Gray.
  - 6. Product:
    - a. Carlisle SureFlex PVC.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane.

### 2.4 DECK SHEATHING AND COVER BOARDS

- A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire resistant type, paper face, 5/8 inch thick.
  - 1. Product: Securock, distributed by Carlisle.
  - 2. HP Protection Mat above the sheathing, loosley laid.

### 2.5 INSULATION SEE INSULATION SPEC SECTION.

### 2.6 ACCESSORIES

- A. Prefabricated Flashing Accessories:
  - 1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
  - 2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
  - 3. Contour Rib Profile: Manufacturer's standard extruded PVC; 1-1/4 inch tall, 2-1/8 inch wide, 3/8 inch profile.
  - 4. Miscellaneous Flashing: Non-reinforced PVC membrane; 80 mils (0.080 inch) thick, in manufacturer's standard lengths and widths.

- B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
- C. Membrane Adhesive: As recommended by membrane manufacturer.
- D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- E. Sealants: As recommended by membrane manufacturer.
- F. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
- G. Edgings and Terminations: Manufacturer's standard edge and termination accessories.
  - 1. Snap-On Edge System:
  - 2. Anchor Bar Fascia System:
  - 3. Drip Edge: Carlisle Sure-Seal Drip Edge.
  - 4. Coping:
  - 5. PVC Coated Sheet Metal.
  - 6. Termination Bar.

## 2.7 PEDESTAL PAVER SYSTEM

- A. Concrete Plaza Pavers: 2 feet square, 2-inch thick, precast concrete pavers weighing a minimum of 18 pounds with a minimum compressive strength of 6,500 pounds per square inch.
- B. Adjustable Pedestals: Provide pedestal system compliant with PVC roofing membrane manufacturer's warranty.
  - 1. Material: ABS plastic base components, non-rubber buffer pads compatible with PVC roofing membrane.
  - 2. Accessories: Slope compensator, extension coupler, and base leveler.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

### 3.2 PREPARATION, GENERAL

- A. Clean substrate thoroughly prior to roof application.
- B. Do not begin work until other work that requires foot or equipment traffic on roof is complete.

### 3.3 CONCRETE DECK PREPARATION

- A. Fill surface honeycomb and variations with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum when tested per ASTM D4263.

### 3.4 INSTALLATION - GENERAL

- A. Perform work in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
- G. When substrate preparation is responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.

### 3.5 INSTALLATION - GENERAL

- A. Perform work in accordance with manufacturer's instructions.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
- G. When substrate preparation is responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.

### 3.6 COVER BOARD

- A. Lay cover boards over insulation with edges in moderate contact without forcing. Gap between boards not to exceed 1/4 inch. Cut cover boards to fit neatly to perimeter.

### 3.7 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate at rate of \_\_\_ gal/sq ft. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- D. Seam Welding:
  - 1. Seam Welding: Overlap edges and ends and seal seams by heat welding, minimum 2 inches.
  - 2. Cover all seams with manufacturer's recommended joint covers.
  - 3. Probe all seams once welds have thoroughly cooled. (Approximately 30 minutes.)
  - 4. Repair all deficient seams within the same day.
  - 5. Seal cut edges of reinforced membrane after seam probe is complete.
- E. At intersections with vertical surfaces:
  - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
  - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Coordinate installation of roof drains and sumps and related flashings.
- G. Daily Seal: Install daily seal per manufacturers instructions at the end of each work day. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

### 3.8 CLEANING

- A. Remove bituminous markings from finished surfaces.

- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

### 3.9 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane and/or finished paver system, protect surfaces using durable materials.

### **END OF SECTION**

## **SECTION 09 67 00 - FLUID-APPLIED FLOORING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Fluid-applied flooring and base.

#### **1.2 REFERENCE STANDARDS**

- A. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
- B. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.

#### **1.3 SUBMITTALS**

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- B. Manufacturer's Installation Instructions: Indicate special procedures.
- C. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

#### **1.4 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section.
  - 1. Approved by manufacturer.

#### **1.5 MOCK UP**

- A. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture and workmanship.
  - 1. Number of Mock-Ups to be Prepared: One.
  - 2. Use same materials and methods for use in the work.
  - 3. Locate where directed.
  - 4. Minimum Size: 48 inches by 48 inches.

- B. Approved mock-up may remain as part of the Work.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

## 1.7 FIELD CONDITIONS

- A. Maintain minimum temperature in storage area of 55 degrees F.
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

## 1.8 *WARRANTY*

- A. Correct defective Work within a one year period after Date of Substantial Completion.*
- B. Warranty: Include coverage for bond to substrate and degradation of chemical resistance.*

## PART 2 PRODUCTS

### 2.1 FLUID-APPLIED FLOORING SYSTEMS

- A. Fluid-Applied Flooring and Seamless Cove Base: Urethane, two component, thermosetting, colored with mineral filler, with aggregate broadcast on undercoat.
  - 1. Base Coat: 1/8 inch thick; color as selected by Architect from manufacturer's full range.
  - 2. Undercoat: Two component, high-solids epoxy bonding coat.
  - 3. Aggregate: Small quartz chips, two colors as selected.
  - 4. Top Coat: Urethane, two component, thermosetting; \_\_\_\_ inch thick; clear.
  - 5. Waterproofing:
  - 6. Abrasion Resistance: Maximum weight loss of .03 g/1000 cycles, when tested in accordance with ASTM D4060.
  - 7. Impact Resistance: 160 in/lb; no cracking, chipping or delamination, when tested with Gardner Impact Tester.
  - 8. Color: Selected by Architect.
  - 9. Basis of Design Product: Stonhard Stontec TRF.

## 2.2 ACCESSORIES

- A. Base Caps: Integral with projecting base of 1/8 inch; same color.
- B. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.
- C. Primer: Type recommended by fluid-applied flooring manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.

### 3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Prepare concrete surfaces according to ICRI 310.2R.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.

### 3.3 INSTALLATION - ACCESSORIES

- A. Install terminating cap strip at top of base; attach securely to wall substrate.

### 3.4 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness indicated.

C. Finish to smooth level surface.

D. Cove at vertical surfaces.

### 3.5 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

**END OF SECTION**

## **SECTION 10 14 00 - SIGNAGE**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Cash allowance for signs.
- B. Room and door signs.

#### **1.2 PRICE AND PAYMENT PROCEDURES**

- A. Allowance amount covers purchase and delivery but not installation.

#### **1.3 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities.

#### **1.4 SUBMITTALS**

- A. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- B. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
  - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
  - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
  - 3. Submit for approval by Owner through Architect prior to fabrication.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. Curved Sign Media Suction Cups: One for each 100 signs; for removing media.

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

## 1.7 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Flat Signs:
  - 1. Best Sign Systems, Inc: [www.bestsigns.com/#sle](http://www.bestsigns.com/#sle).
  - 2. Cosco Industries (ADA signs); ADA Series 1: [www.coscoarchitecturalsigns.com/#sle](http://www.coscoarchitecturalsigns.com/#sle).
  - 3. FASTSIGNS: [www.fastsigns.com/#sle](http://www.fastsigns.com/#sle).
  - 4. Mohawk Sign Systems, Inc: [www.mohawksign.com/#sle](http://www.mohawksign.com/#sle).

### 2.2 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway (**8 total**), whether it has a door or not, not including corridors, lobbies, and similar open areas.
  - 1. Sign Type: Flat signs with engraved panel media as specified.
  - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
  - 3. Character Height: 1 inch.
  - 4. **Sign Size: 4 inches by 8 inches**, unless otherwise indicated.

5. ***Building and Caging Doors:*** Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
- ~~6. ***Conference and Meeting Rooms:*** Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.~~
- ~~7. ***Service Rooms:*** Identify with room names and numbers to be determined later, not those indicated on drawings.~~
- ~~8. ***Rest Rooms:*** Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.~~

## 2.3 SIGN TYPES

- A. Flat Signs: Signage media without frame.
  1. Edges: Square.
  2. Corners: Square.
  3. Wall Mounting of One-Sided Signs: Tape adhesive *for interior locations (6 total). Concealed screws in exterior locations (2 total).*
- ~~B. ***Radius / Curved Signs:*** One piece, curved extruded aluminum media holder securing flat, flexible sign media by curved lip on two sides; other two sides closed by end caps; concealed mounting attachment.
  - ~~1. ***Sizes:*** As indicated on drawings.~~
  - ~~2. ***Finish:*** Natural (clear) anodized.~~
  - ~~3. ***Sign Orientation:*** Curved in horizontal section.~~
  - ~~4. ***Wall Mounting of One-Sided Signs:*** Mechanical anchorage, with predrilled holes, and set in clear silicone sealant.~~~~
- C. Color and Font: Unless otherwise indicated:
  1. Character Font: Helvetica, Arial, or other sans serif font.
  2. Character Case: Upper case only.
  3. Background Color: Clear.
  4. Character Color: Contrasting color *to be selected by Architect from manufacturer's standard colors.*

## 2.4 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
  1. Total Thickness: 1/16 inch.

## 2.5 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.
- B. Concealed screws:** *Stainless steel or galvanized steel.*

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Protect from damage until Substantial Completion; repair or replace damaged items.

**END OF SECTION**