

ADDENDUM NO. 8

June 14, 2022

**Greenfield Central High School Auditorium Renovation and
Addition – Bid Package No. 2
810 N. Broadway
Greenfield, IN 46140**

TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and the Drawings dated May 20, 2022, by Lancer+Beebe LLC. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Page ADD 8-1 through ADD 8-2, Specification Section 00 31 00 – Bid Form, Specification Section 01 23 00 Alternates, and attached Lancer+Beebe LLC Addendum No. 8, dated June 14, 2022, consisting of 3 pages, RFI Log consisting of 4 pages, Specification Sections 32 05 16 – Aggregate Pavements, 32 13 16A – Decorative Concrete Pavement, 32 33 0 – Site Furnishings, 32 92 00 – Seeded Lawn, and 32 93 00 - Plants.

A. SECTION 00 31 00 BID FORM

1. Reissued entire section to include Alternate No. 9 – Decorative Concrete Pavement.

B. SECTION 01 23 00 ALTERNATES

1. Reissued entire section to include Alternate No. 9 – Decorative Concrete Pavement.

C. SPECIFICATION SECTION 01 12 00 MULTIPLE CONTRACT SUMMARY

1. Paragraph 3.03A Bid Categories

D. Bid Category No. 1 – General Trades

1. Delete the following specification sections:

Section	03 35 00	Polished Concrete
Section	10 11 00	Visual Display Boards

2. Add the following specification sections:

Section	32 05 16	Aggregate Pavements
Section	32 13 16A	Decorative Concrete Pavements (ALTERNATE)
Section	32 33 00	Site Furnishings
Section	32 92 00	Seeded Lawn
Section	32 93 00	Plants

CONTRACTOR'S BID FOR PUBLIC WORKS FORM NO. 96

Format (Revised 2013)
(Amended for GCCSC)

**Greenfield Central High School Auditorium
Renovation and Addition – Bid Package No. 2**
(Greenfield Central Community School Corporation)
(Hancock County)

PART I

(To be completed for all bids. Please type or print)

Date (month, day, year): _____

BIDDER (Firm) _____

Address _____ P.O. Box _____

City/State/Zip ____

Telephone Number: _____ Email Address: _____

Person to contact regarding this Bid _____

Pursuant to notices given, the undersigned offers to furnish labor and/or materials necessary to complete the public works project of:

Insert Category No. (s) and Name(s)

Of public works project, ***Greenfield Central High School Auditorium Renovation and Addition- Bid Package No. 2***, in accordance with Plans and Specifications prepared by ***Lancer+Beebe, LLC, 220 N. College Avenue, Indianapolis, IN 46202***, as follows:

BASE BID

For the sum of _____
(Sum in words)

_____ DOLLARS (\$_____)
(Sum in figures)

Receipt of Addenda No. (s) _____

Bidder agrees that this Bid shall remain in force for a period of sixty (60) consecutive calendar days from the due date, and Bids may be accepted or rejected during this period. Bids not accepted within said sixty (60) consecutive calendar days shall be deemed rejected.

Attended pre-bid conference YES _____ NO _____

Has visited the jobsite YES _____ NO _____

The Bidder has reviewed the Guideline Schedule in Section 01 32 00 and the intent
Of the schedule can be met. YES NO

Bidder has included their Written Drug Testing Plan that covers all employees of the bidder who will perform work on the public work project and meets or exceeds the requirements set in IC 4-13-18-5 or IC 4-13-18-6. YES NO_____

The Skillman Corporation's diversity initiative is to create a program to encourage, assist and measure the active participation of Minority- Owned, Women-Owned, Veteran – Owned and Disabled Individual-Owned Businesses. The Program is to ensure that MWVDBEs are provided full and equal opportunity to participate in all Skillman Corporation's Projects.

Bidder has included:

DBE:	YES _____%	NO _____
MBE:	YES _____%	NO _____
WBE:	YES _____%	NO _____
VBE:	YES _____%	NO _____

The undersigned further agrees to furnish a bond or certified check with this Bid for an amount specified in the Notice to Bidders. If Alternate Bids apply, submit a proposal for each in accordance with the Plans and Specifications.

If additional units of material included in the contract are needed, the cost of units must be the same as that shown in the original contract if accepted by the governmental unit. If the bid is to be awarded on a unit bases, the itemization of the units shall be shown on a separate attachment.

The contractor and his subcontractors, if any, shall not discriminate against or intimidate any employee, or applicant for employment, to be employed in the performance of this contract, with respect to any matter directly or indirectly related to employment because of race, religion, color, sex, national origin or ancestry. Breach of this covenant may be regarded as a material breach of the contract.

CERTIFICATION OF USE OF UNITED STATES STEEL PRODUCTS
(if applicable)

I, the undersigned bidder or agent as a contractor on a public works project, understand my statutory obligation to use steel products made in the United States (I.C. 5-16-8-2). I hereby certify that I and all subcontractors employed by me for this project will use U.S. steel on this project if awarded. I understand that violations hereunder may result in forfeiture of contractual payments.

ALTERNATE BIDS

A blank entry or an entry of "No Bid", "N/A", or similar entry on any Alternate will cause the bid to be rejected as non-responsive only if that Alternate is selected. If no change in the bid amount is required, indicate "No Change".

****MARK "ADD" OR "DEDUCT" FOR EACH ALTERNATE****

Alternate Bid No. 1A – Ground Floor Epoxy Terrazzo

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 1B – Level 2 Epoxy Terrazzo

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 2A – AHU Manufacturer (Carrier)

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 2B – AHU Manufacturer (Daikin)

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 3A – Temperature Control Manufacturer (Alerton)

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 3B – Temperature Control Manufacturer (ALC)

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 4 – AHU-1 Heat Pipe

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 5 – Theatre Rigging

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 6 – SR1 Linear Fixtures

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 7 – Natatorium Light Fixtures

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$_____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 8 – Natatorium Painting

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$ _____) ADD
(sum in figures) DEDUCT

Alternate Bid No. 9 – Decorative Concrete Pavement

Change the Base Bid the sum of _____
(sum in words)
_____ DOLLARS (\$ _____) ADD
(sum in figures) DEDUCT

PART II

(For projects of \$150,000 or more – IC 36-1-12-4)

These statements to be submitted under oath by each bidder with and as a part of his bid. (Attach additional pages for each section as needed.)

SECTION I EXPERIENCE QUESTIONNAIRE

1. What public works projects has your organization completed for the period of one (1) year prior to the date of the current bid?

Contract Amount	Class of Work	Completion Date	Name and Address of Owner

2. What public works projects are now in process of construction by your organization?

Contract Amount	Class of Work	Completion Date	Name and Address of Owner

3. Have you ever failed to complete any work awarded to you?_____If so, where and why?

4. List references from private firms for which you have performed work.

SECTION II PLAN AND EQUIPMENT QUESTIONNAIRE

1. Explain your plan or layout for performing proposed Work. (Examples could include a narrative of when you could begin, complete the project, number of workers, etc. and any other information which you believe would enable the governmental unit to consider your bid.)

2. Please list the names and addresses of all subcontractors (i.e. persons or firms outside your own firm who have performed part of the work) that you have used on public works projects during the past five (5) years along with a brief description of the work done by each subcontractor.

3. If you intend to sublet any portion of the work, state the name and addresses of each subcontractor, equipment to be used by the subcontractor, and whether you will required a bond. However, if you are unable to currently provide a listing, please understand a listing must be provided prior to contract approval. Until the completion of the proposed project, you are under a continuing obligation to immediately notify the governmental unit in the event that you subsequently determine that you will use a subcontractor on the proposed project.

4. What equipment do you have available to use for the proposed Project? Any equipment used by subcontractors may also be required to be listed by the governmental unit.

5. Have you into contracts or received offers for all materials which substantiate the prices used in preparing your proposal? If not, please explain the rationale used which corroborate the process listed.

SECTION III CONTRACTOR'S FINANCIAL STATEMENT

Attachment of Bidder's financial statement is mandatory. Any Bid submitted without said financial statement as required by statute shall thereby be rendered invalid. The financial statement provided hereunder to the governing body awarding the Contract must be specific enough in detail so that said governing body can make a proper determination of the Bidder's capability for completing the Project if awarded.

SECTION IV CONTRACTOR NON-COLLUSION AFFIDAVIT

The undersigned Bidder or agent, being duly sworn on oath, says that he has not, nor has any other member, representative, or agent of the firm, company, corporation or partnership represented by him, entered into any combination, collusion or agreement with any person relative to the price to be bid by anyone at such letting nor to prevent any person from bidding nor to induce anyone to refrain from bidding, and that this Bid is made without reference to any other bid and without any agreement, understanding or combination with any other person in reference to such bidding.

He further says that no person or persons, firms, or corporations has, have, or will receive directly or indirectly, any rebate, fee, gift, commission, or thing of value on account of such contract.

SECTION V OATH AND AFFIRMATION

I HEREBY AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE FACTS AND INFORMATION CONTAINED IN THE FOREGOING BID FOR PUBLIC WORKS ARE TRUE AND CORRECT

Dated at _____ this _____ day of _____, 20

(Name of Organization)

By

(Title of Person Signing)

ACKNOWLEDGEMENT

STATE OF _____)

) SS:

COUNTY OF _____)

Before me, a Notary Public, personally appeared the above-named

Swore that the statements contained in the foregoing document are true and correct.

Subscribed and sworn to before me this _____ day of _____,

(Title)

Notary Public

My Commission Expires: _____

County of Residence: _____

END OF SECTION 00 31 00

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 PURPOSE

- A. The Bids for the Alternates described herein are required in order for the Owner to obtain information necessary for the proper consideration of the Project in its entirety.

1.03 ALTERNATES

- A. Definitions: Alternates are defined as alternate products, materials, equipment, installations or systems for the Work, which may, at Owner's option and under terms established by Instructions to Bidders, be selected and recorded in the Owner-Contractor Agreement to either supplement or displace corresponding basic requirements of Contract Documents. Alternates may or may not substantially change scope and general character of the Work; and must not be confused with "allowances", "unit prices", "change orders", "substitutions", and other similar provisions.

1.04 SCHEDULE OF ALTERNATES

- A. ALTERNATE NO. 1: EPOXY TERRAZZO FLOORING
 - 1. Base Bid: Luxury Vinyl Tile
 - 2. Alternate 1A: State cost to delete LVT and provide materials, labor, and equipment to install the Epoxy Terrazzo Flooring at Room Nos. L102, L104, L118 and B146 as indicated on A720 and A721L. Include precast terrazzo wraparound treads from L102 down to L104.
 - 3. Alternate 1B: State cost to delete LVT and provide materials, labor, and equipment to install the Epoxy Terrazzo Flooring at Room Nos. L201 and L202 as indicated on A720 and A722L. Include precast terrazzo stair treads from L202 down to L102.
- B. ALTERNATE NO. 2: AHU MANUFACTURER
 - 1. Base Bid: Trane
 - 2. Alternate 2A: State cost to provide AHU Equipment as manufactured by Carrier.
 - 3. Alternate 2B: State cost to provide AHU Equipment as manufactured by Daikin.

- C. ALTERNATE NO. 3: TEMPERATURE CONTROL MANUFACTURER
1. Base Bid: Trane

2. Alternate 3A: State cost to provide Temperature Controls as manufactured by Alerton.

3. Alternate 3B: State cost to provide Temperature Controls as manufactured by ALC.
- D. ALTERNATE NO. 4: AHU-1 HEAT PIPE
1. Base Bid: No Heat Pipe at AHU-1

2. Alternate: State cost to provide materials, labor, and equipment to install the heat pipe at AHU-1.
- E. ALTERNATE NO. 5: THEATRE RIGGING
1. Base Bid: (23) manual counterweight linesets and (8) fixed speed, motorized linesets.

2. Alternate: State cost to provide materials, labor, and equipment to upgrade (3) manual linesets to variable speed, motorized operation for a total of (20) manual and (11) motorized linesets.
- F. ALTERNATE NO. 6: SR1 LINEAR FIXTURES
1. Base Bid: No Work

2. Alternate: State cost to provide materials, labor, and equipment to install the SR1 linear light fixtures, wiring and controls as indicated in the AL series drawings.
- G. ALTERNATE NO. 7: NATATORIUM LIGHT FIXTURES
1. Base Bid: New H3 Fixtures per Key Note 1 on Sheet E201K-A.

2. Alternate: State cost to provide materials, labor, and equipment to remove and dispose of the existing Natatorium light fixtures and install new H3 fixtures per Key Note 2 on Sheet E201K-A.
- H. ALTERNATE NO. 8: NATATORIUM PAINTING
1. Base Bid: Paint walls indicated by Key Note 6 on Sheet A721L.

2. Alternate: State cost to provide materials, labor, and equipment to paint the existing Natatorium walls per Key Note 23 on Sheet A721L.

I. ALTERNATE NO. 9: DECORATIVE CONCRETE PAVEMENT

1. Base Bid: Standard Concrete Pavement.

2. Alternate: State cost to provide materials, labor, and equipment for the two color Decorative Concrete Pavement per Material Legend P1.2 as indicated on Sheet L100.

PART 2 - PRODUCTS, PART 3 - EXECUTION (Not Used)

END OF SECTION 01 23 00

LANCER + BEEBE, LLC

Project # 21107

ADDENDUM NO. EIGHT

PROJECT: GREENFIELD CENTRAL – AUDITORIUM RENOVATION AND ADDITION

PROJECT NUMBER: 21107

DATE OF ADDENDUM: JUNE 14, 2022



THIS ADDENDUM FORMS A PART OF THE CONTRACT DOCUMENTS AND IS ISSUED IN ACCORDANCE WITH THE INSTRUCTIONS TO BIDDERS. ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY SIGNING THE ADDENDUM ACKNOWLEDGMENT SECTION OF THE BID FORM.

Q+A LOG: PLEASE REVIEW THE ATTACHED QUESTION AND ANSWER LOG.

SPECIFICATIONS:

1. INDEX:
 - CHANGE:
 - DELETE SPECS SECTIONS:
 - 03 35 00 POLISHED CONCRETE
 - 10 11 00 VISUAL DISPLAY BOARDS
 - ADD SPEC SECTIONS:
 - 32 05 16 AGGREGATE PAVEMENTS
 - 32 13 16A DECORATIVE CONCRETE PAVEMENT
 - 32 33 00 SITE FURNISHINGS
 - 32 92 00 SEEDED LAWN
 - 32 93 00 PLANTS

2. SPEC SECTION 03 35 00 POLISHED CONCRETE
CHANGE:
DELETE SPEC SECTION IN ITS ENTIRETY
3. SPEC SECTION: 09 84 10 ACOUSTIC PANEL DIFFUSERS
CHANGE: CHANGE THE FOOTER TO SAY "ACOUSTIC PANEL
DIFFUSERS"
ADD FILZFELT DESIGN FELT AS AN APPROVED EQUAL FOR TEX-1 AND
TEX-2
ADD AUTEX QUIETSPACE PANELS AS AN APPROVED EQUAL FOR AP-2,
AP-3, AP-4
4. SPEC SECTION: 09 84 20 GLASS WALL PANEL SYSTEMS
CHANGE: CHANGE THE FOOTER TO SAY "GLASS WALL PANEL
SYSTEMS"
5. SPEC SECTION: 12 61 00 FIXED SEATING
CHANGE: ADD IRWN CITATION FIXED AUDITORIUM SEATING AS AN
APPROVED EQUAL
6. SPEC SECTION: 32 05 16 AGGREGATE PAVEMENTS
CHANGE: ADD SPEC SECTION IN ITS ENTIRETY
7. SPEC SECTION: 32 13 16A DECORATIVE CONCRETE PAVEMENT
CHANGE: ADD SPEC SECTION IN ITS ENTIRETY
8. SPEC SECTION: 32 33 00 SITE FURNISHINGS
CHANGE: ADD SPEC SECTION IN ITS ENTIRETY
9. SPEC SECTION: 32 92 00 SEEDED LAWN
CHANGE: ADD SPEC SECTION IN ITS ENTIRETY
10. SPEC SECTION: 32 93 00 PLANTS
CHANGE: ADD SPEC SECTION IN ITS ENTIRETY

ATTACHMENTS:

QUESTION LOG

32 05 16 AGGREGATE PAVEMENTS

32 13 16A DECORATIVE CONCRETE PAVEMENT

LANCER + BEEBE, LLC

Project # 21107

32 33 00	SITE FURNISHINGS
32 92 00	SEEDED LAWN
32 93 00	PLANTS

END OF ADDENDUM NO. EIGHT

Greenfield Auditorium RFI Log

RFI Contact(s):
RFI Due Date/Time:
Bid Date/Time:

Published:06/14/2022

RFI LOG

No.	DATE SUBMITTED	RESPONSIBLE PARTY	QUESTION	DATE RECEIVED	FROM	RESPONSE
1	4/28/2022	L+B	Please note Item 2.4, A., in specification 034100. Is the precast mix on all panels to be all structural gray concrete? All exterior panels appear to be covered with thin brick. For thin brick clad panels, it is recommended to acid etch/rinse the precast panels to clean the thin brick and to etch between the thin brick pieces for consistency. Do you want the brick clad precast panels to be acid etched/rinsed or the leave the finished surface with the cast thin brick unfinished?	4/28/2022	CORES LAB	Structural gray concrete is acceptable. Acid etched/rinsed is desired on the exterior.
2	4/28/2022	L+B	Please note Item 2.13, A. in specification 034100. The interior precast panel faces, are they to have a smooth as cast from the form finish? And, can the precast panel (all) back finishes be a two-pass hard hand steel trowel?	4/28/2022	CORES LAB	Precast panel back finishes can be a two-pass hand steel trowel.
3	4/28/2022	L+B	Please note Item 2.14, B., 3.(thin brick type 3), per the Exterior Elevation Notes on sheets A201, 202, and 203, Glen Gery Brick noted should be Pearl River, Wire Cut, not Brazilwood, Wire cut. Please confirm? Please be advised that thin brick lead times are not controlled by the precaster and could affect the project schedule if the thin brick material is not available/received at the precast plant in time to meet the casting schedule	4/28/2022	CORES LAB	See revised specification issued in Addendum No. 5.
4	4/28/2022	TSC	Are electrical boxes and conduits going to need to be cast into the precast panels? If so, please confirm that the electrical hardware will be furnished by others to the precast plant prior to casting by Others. Also, can we be given an estimated quantity of electrical hardware that will need to be cast in?	4/28/2022	CORES LAB	Yes, these items will be furnished by the Electrical/Low Voltage Contractor to the Bid Category No. 2 Contractor. Please refer to the bid documents to determine quantities and locations.
5	4/28/2022	TSC	Please confirm the steel ledge angels shown, attached to steel embed cast in precast embed plates, are to be furnished and installed by Others. (Ex. details 7, 9, 10 – S610). And the precaster in those similar details is to furnish and cast in the flat embed plates only cast into the precast panel backs?	4/28/2022	Geiger & Peters	All connection steel shapes, attached to precast embed plates, required for the proper support of the structural steel system shall be provided by Bid Category No. 4 Contractor..
6	4/28/2022	L+B	Please reference specification 034100, page 7, Item 2.13, B. Can you confirm the size of all thin brick to be cast into the precast panels for the project is to be modular size, 2-1/4" x 7-5/8"?	4/28/2022	CORES LAB	See revised specification issued in Addendum No. 2.
7	5/13/2022	L+B	07 53 23 - The EPDM spec states the system is ballasted but also indicates the insulation is to be mechanically fastened. I assume this is a mistake and the insulation is to be loose laid. (fastening would defeat the cost advantage of ballast)	5/3/2022	Foster Contracting	Ballasted roof scope is limited to the Natatorium seating expansion (Unit K).

8	5/13/2022	L+B	07 53 23 - The EPDM spec lists Manville and Firestone as approved membrane manufacturers. I would assume Firestone and Manville would also be acceptable for the PVC membrane? I would think the school would prefer one manufacturer warranty.	5/3/2022	Foster Contracting	Yes - These manf. are acceptable. Manufacturers products must meet or exceed product performance and warranty listed in the specifications.
9	5/13/2022	L+B	07 54 19 - The PVC spec lists water based adhesive. Is solvent based adhesive also acceptable?	5/3/2022	Foster Contracting	Acceptable adhesives are per the manufacturer installation instructions/requirements.
10	5/13/2022	L+B	07 54 19 - The PVC spec lists light gray as the specified color for the membrane. This may / will significantly lengthen the lead time. I would advise proceeding with white membrane.	5/3/2022	Foster Contracting	Manufacturers standard white or grey is acceptable.
11	5/13/2022	L+B	Drawing A003 - Is R1c the only roof system that is the ballasted EPDM? I cannot tell which membrane goes where	5/3/2022	Foster Contracting	R1c is the only roof system that is ballasted. Roof types are labeled throughout the documents.
12	5/13/2022	TSC	What is the material for the wall rail (Note #46) and segmented handrail (note #49 and #59) on A112L? Are we responsible for these? Reason I ask is because we are not responsible for the Decorative Rail which is commonly aluminum or stainless. This would lead me to believe that the rails in question would be aluminum or stainless to match the deco rail and the deco rail vendor would be responsible for these.	5/10/2022	Almet, Inc.	Items mentioned here should be considered by the decorative metal contractor.
13	5/13/2022	L+B/TSC	Who is responsible for stair nosings? I see where they are supposed to go, but its not listed as to who is responsible for them.	5/10/2022	Almet, Inc.	AT THIS TIME WE DO NOT ANTICIPATE CAST IN NOSINGS.
14	5/13/2022	L+B	Where is detail 4/A517 cut? Its showing "Front of House" but I do not see where its cut. Also, it shows chain-link fencing along the "catwalk except as noted". This is the only detail that shows where it is noted. Is fencing needed all around the catwalk? Who is responsible for it? If we are, what is the spec for it? Its not listed anywhere.	5/10/2022	Almet, Inc.	See revised sheet A112L for sections.
15	5/13/2022	L+B	What is the spec or basis of design for the "Perforated Metal Riser"? Only thing listed is that I am to provide 14 GA if not stated elsewhere	5/10/2022	Almet, Inc.	Stairs in this project DO NOT have "Perforated Metal Risers"
16	5/13/2022	L+B	Would 8' precast panels be acceptable? We can improve our delivery date with 8' panels.	5/10/2022	FABCON	Design team does not recommend switching to an 8' panel as this will force redesign of exterior, interior structural, and MEP elements.
17	5/13/2022	TSC	Elevator Questions - Who is responsible for the elevator accessories 1. Elevator sill angles 2. Elevator sump pit grating We do plan on including the elevator hoist beam. This is common. The reason why we ask is that I see from the drawings that the elevator pit ladder is being supplied by the elevator MFG. (5/A402) Otherwise, we would add these with our bid.	5/10/2022	Almet, Inc.	1. Support angles for elevator sills by Elevator Subcontractor. 2. Elevator sump pit cover/grate by Bid Category No. 4 Contractor. 3. Hoist beams by Bid Category No. 4 Contractor. 4. Elevator pit ladders by Elevator Subcontractor.
18	5/13/2022	L+B/TSC	Is the Box Boom guardrail at detail 1 & 2/A517 the guardrail noted #61 on A112L? There are 6 total of different lengths. If its not Note #61, am I responsible for detail 1 & 2/A517 If so, how is it attached to the structure?	5/12/2022	Almet, Inc.	Bid Category No. 4 Contractor shall provide Box Boom and guard rail pipe assemblies. See revised plan notes on A112L in Addendum No. 5. Please refer to A303 for axon views of the areas in question.
19	5/16/2022	TSC	Who is building and maintaining the roadways for crane and truck access?	5/12/2022	High Concrete	Bid Category No. 1 General Trades

20	5/16/2022	TSC	Who is responsible for cleaning the footings from the mud and debris tracked by other trades prior to panel erection?	5/12/2022	High Concrete	Bid Category No. 1 General Trades
21	5/16/2022	TSC	Will there be any underground utilities our trucks/cranes should be aware of? The site changes drastically during construction and our team cannot be responsible for that.	5/12/2022	High Concrete	Refer to the Site Utilities drawing C400 within the Civil documents; contractor is to assume that the new structures will be in place and that road plates will be required to protect same. Bid Category No. 2 Contractor shall protect these utility structures as required during precast erection work.
22	5/16/2022	TSC	How long do we anticipate the braces being left on for until the steel is erected? 1 month additional is included, but sometimes it carries into the 2nd month	5/12/2022	High Concrete	Include two (2) months of bracing.
23	5/16/2022	TSC	Will there be requirements for flagmen and/or barricades, road closures	5/12/2022	High Concrete	Flagmen and barricades, as required to safely erect your work, are to be included. We do not anticipate requiring any road closures.
24	5/16/2022	L+B	Spec Section 34100 - 2.8A and 2.8B Insulated Flat Wall Panel Accessories indicates ship-lap edges and glass-fiber vinylester connectors for insulation and wythe connectors, which would indicate a Thermomass System. Will other systems be allowed if they meet the required structural design? Square edges and carbon-fiber wythe connectors have been used in similar school projects with equal to or better than designed capacities.	5/12/2022	High Concrete	We do not require 'ship lap' edges. It is not necessary and will not affect to any great degree the thermal performance of the panels. Butt edges for foam board will be allowed. The connectors are HK, non-metal and non-conductive and should be allowed; other non-conductive connectors like c-grid should also be acceptable.
25		L+B	Please confirm the external insulation and what type for the exposed duct in the auditorium from AHU-1 on M101L? The schedule on M702 says all the other exposed ducts call for dual wall insulated duct. Sec 230713 2.3 calls out fiberglass board insulation for exposed ductwork, board is for rectangular duct, but all the exposed duct is round.	6/8/2022	Lehman's	
26	6/9/2022	L+B	142400 - Elevators 1.13A1. This has all items listed, please confirm that there shall not be any seismic for this project. 2.14A1 and 1.5A – please confirm that the warranty/service for the elevator is one year and that the building listing, if any, is not applicable if different. I did not see a time listed. 3.2.9 A5e. please confirm that stainless steel can be provided, this ceiling is not available in powdercoat. 4.3.3 A. There is no time listed, and we take this to be the requirement IF elected by the GC. Please confirm that no Temporary use is to be included in the bid.	6/8/2022	TKE	1. Confirmed. 2. Confirmed. 3. Stainless steel is acceptable. 4. Confirmed
27		L+B	Is the expanded bleacher area, adjacent to the auditorium addition, outside of the new FP systems scope of work? There is not a fire protection system within the existing swimming pool area.	6/9/2022	Integrity	Provide Sprinkler system over the pool expansion
28		L+B	Drawing 5/TP101 shows the stage right side of some platforms open to the pit, and thus visible to the audience. Would it be preferable to have these open sides covered with skirting, or open with black painted frames and legs?	6/9/2022	Wenger	Exposed platform frames and legs at the ADA ramp and landing do not need to be black nor covered with skirting.

29		L+B	A121 Note 48 indicates a portable ADA ramp straight on with pit opening to seating area. 7/A314 appears to show this ADA ramp, but it does not reach the height of the seating area. Can it please be confirmed that the ADA ramp is to be per 5/TP101 & 6/TP101, and can A121 and 7/A314 please be revised to not include the straight on short ADA ramp?	6/9/2022	Wenger	ADA Ramp is per 5/TP101&6/TP101. Architectural graphics to be updated in future addendum.
30		L+B	Drawing TP101 does not show a detail of the guard rails/hand rails on the platforms shown in 5/TP101. Are guard rails that restrict a sphere with a diameter larger than 4" to pass required? Are manufacturers standard guard rails acceptable?	6/9/2022	Wenger	The 4" sphere rule should only apply to guard rails located +2'-6" or more from the level below which is not applicable to the ADA landing. Manufacturer standard products are acceptable.
31		L+B	5/TP101 does not appear to show 5' diameter of clearance for a wheel chair to turn with the necessary overhanging ramp hand rails. Does the specified design meet the minimum clearance space required by the AHJ? If not, can a revised drawing please be provided?	6/9/2022	Wenger	Assume that a 5'-0" diameter wheelchair turning space will be required.
32		L+B	11 61 23 Theatre Portable Platforms - •2.2 E. specifies aluminum frames and leg assemblies that are not visible to the audience do not require black finish. 3.1 C. specifies all metal fabricated items shall be given at least one coat of primer and one coat of finish paint. Color: black. Can 2.2 E. please be confirmed that mill aluminum finish frames and legs are approved provided they are not visible to the audience? Can 3.1 C. please be removed?	6/9/2022	Wenger	Black finish is not required for any platform frames. However, all guard rails or handrails must have a black finish.

SECTION 32 05 16

AGGREGATE PAVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Stone Mulch Type 1 Under entrance canopy
 - 2. Stone mulch Type 2 Under entrance canopy
- B. Related Sections:
 - 1. Division 31 Section 31 20 00 "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
 - 2. Division 32 Section "Concrete Pavement"

PART 2 - PRODUCTS

2.1 STONE MATERIAL

- A. Stone Mulch Type 1
 - 1. Material: #11 limestone chips
 - 2. Thickness: 3"
 - 3. Color: white
 - 4. Ensure all geotextile fabric is covered and not visible
- B. Stone Mulch Type 2
 - 1. Material: #2 Terrazzo Glass
 - 2. Size: 1/4" – 3/8"
 - 3. Thickness: 3"
 - 4. Color: Dark Blue
 - 5. Ensure all geotextile fabric is covered and not visible
- C. Geotextile fabric
 - 1. Preapproved:
 - a. Amoco Engineering Fabric, Propex 2000, Atlanta GA (404) 955-0935
 - b. TenCate Geosynthetics, Mirafi180N, Pendergrass GA (706) 693-2226
 - 2. Approved equal.
- D. Metal Edging

1. To be placed between different aggregates
2. Preapproved: Curv-rite Aluminum Edging 3603 North Main Street, Wayland MI 1-800-366-2878
 - a. Model: 3000 Series
 - b. Size: 3/16" x 5"
 - c. Color: Black Anodized
 - d. Install per manufacturer's recommendation for stone and aggregate

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Proof roll prepared subgrade surface to check for unstable areas and areas requiring additional compaction.
- B. Do not proceed with installation of base course until deficient subgrades have been corrected and ready to receive base course.

3.3 INSTALLATION

- A. Geotextile fabric: Place under aggregate base as indicated in the Drawings.
 1. Cut fabric to conform to base width
 2. Overlap joints per manufacturer's instructions.
- B. Aggregate surface: Place aggregate over compacted subgrade in layers no more than 4" loose depth
 1. Compact each layer to 95 percent maximum density as determined by ASTM D 1557
 2. Provide compacted thickness per the drawings
- C. Edging shall be a steel edge as required by details. Provide smooth consistent arcs and straight, true lines.
- D. Compaction:
 1. Roll with a heavy lawn roller (minimum 225 pounds and maximum 30" width), to achieve finish grade and initial compaction.
 2. Hand tamp edges adjacent to walls, steps etc.
 3. Use a heavy (1 ton minimum) small rider, after having initially used the lawn roller, to obtain the final dense, smooth, uniform texture.

3.4 INSPECTION

- A. Final thickness of completed work shall not vary more than $\frac{1}{2}$ inch from dimension indicated.
 - 1. Measurements may be taken by means of test holes taken at random in finished surface.
 - 2. Correct any variations in the thickness beyond the allowable $\frac{1}{2}$ inch by repeating the procedures listed.

END OF SECTION 32 05 16

SECTION 32 13 16 A

DECORATIVE CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Concrete sidewalks, plazas, and specialty finishes in pedestrian applications.

- B. Submittals: In addition to Product Data, submit design mixes for each concrete pavement mix.

- 1. Submit material certificates signed by manufacturers certifying that each concrete material complies with requirements.
 - 2. Samples: Three (3) 1'-0" x 1'-0" samples of each standard and specialty pavement texture for approval by the Owner and Landscape Architect. Also refer to mockup panels below.

- C. Related Sections include the following:

- 1. Division 1 Section Sustainability Requirements for project sustainability requirements
 - 3. Division 31 Section "Earthwork" for sub-grade preparation, grading and base course.
 - 4. Division 32 Section "Concrete Paving" for adjacent curb and drives.
 - 5. Division 32 Section "Pavement Joint Sealants"

1.3 Quality Assurance:

- A. Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.

- 1. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
 - 2. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
 - 3. Testing Agency Qualifications: Contractor will engage an independent testing agency qualified according to ASTM C1077 and ASTM E329 to conduct testing as documented by ASTM E548.
 - 4. Mockups: Provide two (2) sample panels measuring at least 5'-0" x 5'-0" that demonstrate all applications and workmanship for concrete paving, including texture,

jointing, and finishes. Alternatives available to the Landscape Architect for final flatwork shall include no less than:

- a. Smooth trowel, light broom, medium broom, and sand matrix finishes.
- b. Sawn, chamfer sawn, and tooled joints. Landscape Architect will select final joints based upon mockups.

5. Pre-installation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 DECORATIVE CONCRETE

- A. Color: Integral Color, two colors, as selected by Landscape Architect from SIKKA USA SikaColor – 120G Coachella Sand
- B. Finish: Sand Release Finish (Sand Matrix Finish)
- C. Reinforcing: per details
- D. Joints:
 1. Chamfered Sawn cut, per details, for straight joints
 2. Tooled for curved joints, per detail. TROWEL MARKS IN CONCRETE SHALL NOT BE ACCEPTED

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
- B. Form Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.3 STEEL Reinforcement Materials:

- A. Plain-Steel Welded Wire Fabric: ASTM A 185, flat sheets.
- B. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Joint Dowel Bars: Plain steel bars, ASTM A615/A615M, Grade 60 (Grade 420). Cut bars true to length with ends square and burr-free.
- D. Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening steel reinforcement; manufactured according to CRSI's "Manual of Standard Practice"

2.4 CONCRETE Materials:

- A. Select portland cement alone or in combination with fly ash or ground granulated blast-furnace slag in subparagraphs below.
- B. Portland Cement: ASTM C 150, Type I or II.

1. Fly Ash: ASTM C 618, Class F or C.
 2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- C. Aggregate: ASTM C 33, uniformly graded, from a single source.
1. Maximum Aggregate Size: 3/4 inch nominal
 2. Exposed fine aggregate: FA-2 natural sand. Free of materials with deleterious reactivity to alkali in cement
- D. Water: Potable.

2.5 ADMIXTURES

- A. Certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures, as follows:
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
- F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.6 CURING MATERIALS

- A. Select curing aids and materials from subparagraphs below, retaining optional materials if applicable.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
1. Select curing compound from subparagraphs below.
 2. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
 3. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
 4. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

2.7 JOINT FILLER

- A. Preformed; non-extruding bituminous type (ASTM D 1751) or sponge rubber or cork (ASTM D 1752).
- B. Thickness: 1/2 inch.
- C. Backer rod: ASTM D 5249, Type 2, of a thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.
- B. Retain subparagraph below for integrally colored concrete pavement.
- C. Sealer: Provide and install penetrating sealer.
- D. Polyethylene Film: ASTM D 4397, 1 mil thick, clear
- E. Chemical Surface Retarder: Water-soluble, liquid set retarder without color dye. for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/16th to 1/8th inch. (1.5 to 3 mm).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. True Etch Surface Retarder; Burke Group, LLC
 - b. Exposee; Cehmmasters
 - c. Delay S; Conspec marketing and Manufacturing Co., Inc.
 - d. Concrete Surface Retarders; Euclid Chemical, Co.
 - e. Expose; Kaufman Products, Inc.
 - f. Surfard; Metacrete Industries
 - g. Crete-Nox TA; Non-Crete Products Group. Kinsman Corporation
 - h. Rugasol-S; Sika Corporation
 - i. Certi-Vex Envoiset; Vexcon Chemicals, Inc.
- F. Concrete Silane Sealer: 100% reactive, 40% solids by weight, deep penetrating alkyl polymer silane, non-volatile, non-staining, invisible, 10 year performance guarantee for protection of concrete subject to severe environmental conditions with frequent exposure to de-icing salts complying with National Cooperative Highway Research Program No 244 and ASTM C 672 with a rating of 0, no scaling, the highest rating with the following physical properties:
 - 1. Yellowing: No
 - 2. Surface Darkening: no
 - 3. Film Forming: No
 - 4. NCHRP 244 Series II:
 - a. Absorption: 93% reduction, minimum
 - 5. NCHRP 244 Series IV:
 - a. Total Chloride Reduction: 98% reduction, minimum

6. Resistance to Chloride-Ion Penetration:
 - a. AASHTO-T 259:
 - 1) 1/2 inch depth: 98% minimum
 - 2) 1 inch depth: 98% minimum
 - a. 20 percent soluble solutions are not acceptable
 - b. Acceptable Product:
 - 1) Penetrating Sealer 40 by Sonneborn
 - 2) Baracade Silane 40 by Tamms
 - 3) Pentane 40 or Pentane 40 WB by L&M construction Chemicals, Inc.
 - 4) Weather Worker 8-40 by Dayton Superior
- G. Concrete Mixes: Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, with the following properties:
 1. Revise properties below to suit Project.
 2. Compressive Strength (28 Days): 4,000 psi.
 3. Maximum Water-Cementitious Materials Ratio: 0.50.
 4. Slump Limit: 4 inches (100 mm), average with (+/-) 1" variance. Maintain consistent slump throughout construction to ensure compatible color and finish of adjacent flatwork.
 5. Air Content: 4.5 to 7.5 percent.
 6. High Sand Content: 60%
- H. Synthetic Fibers: Uniformly disperse 3/4" to 1" length nylon fibers into concrete mix at manufacturer's recommended rate, but not less than 1 1/2 lb./cu. yd. (0.90 kg/cu. m).
- I. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.
- J. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Surface Preparation: Proof-roll prepared subbase, and remove loose material from surface.
- B. Forms: Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations.
- C. Reinforcement: Accurately position and support reinforcement, and secure against displacement. Set wire ties with ends directed into concrete.
 1. Install welded wire fabric in lengths as long as practicable; lap at least one full mesh, and lace splices with wire.

3.2 JOINTS

- A. Align curb, gutter, and sidewalk joints. Provide straight and true joints in all conditions.

- B. Place joint filler to separate paving from vertical surfaces and other components. Recess top of filler ½ inch for sealant placement.
- C. Provide joint backer materials that are non-staining, are compatible with joint substrates, sealants, primers and other joint fillers, and are approved for applications indicated by sealant manufacturer based upon field experience and laboratory testing.
- a. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests
- D. Joint Sealant Products:
- a. Type SL Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.
 - b. Multicomponent Low-Modulus Sealant for Concrete: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.
 - c. Subject to compliance with requirements, provide one of the following or approved equal prior to bidding:
 - 1) Type SL Silicone Sealant for Concrete: 890-SL; Dow Corning.
 - 2) Type SL Elastomeric Polyurethane Sealant for Concrete: SL-2 Sonolastic; Sonneborn.
- E. Colors of Exposed Joint Sealants: As selected by Landscape Architect from manufacturer's full range to ensure color compatibility with adjacent concrete pours.
- F. Joint Tooling:
1. Saw cut contraction joints as soon as possible after slab finishing yet without dislodging aggregate. Cut 1/3 into depth of slab. Saw cut joints shall be used in conditions called out in plans and details, generally for straight-run patterns. All sawn joints to fully extend to building and vertical faces.
 2. Hand-tool contraction joints as indicated in Details. Tooled joints shall be used in conditions called out in plans and details, generally for curved joint patterns.
- G. Space joints as indicated on plans. In cases where joint patterns are not represented in plan, use the following guidelines. Confirm intent with the Landscape Architect before commencing work.
1. Maximum Spacing for Pavement Type

<u>Joint Type</u>	<u>Drives, Parking</u>	<u>Sidewalks</u>
Control	20'	8'
Expansion	--	40' or per plans
Longitudinal	12' or Construction	--
- H. Joints: Locate and install construction, isolation, contraction, and expansion joints as indicated in Plans.

3.3 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Place concrete in a continuous operation within planned joints or sections.
 - 1. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
 - 2. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping according to recommendations in ACI 309R.
 - 3. Screed and initial-float concrete surfaces with darby or bull float before excess moisture or bleed water appears on the surface.
 - 4. Protect concrete from cold or hot weather during mixing, placing, and curing.
- B. Evaporation Retarder: Apply to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

3.4 CONCRETE FINISHING

- A. General: Do not wet concrete surfaced during screeding, initial floating and finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surfaces to true planes with gaps below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm). Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
- C. Monolithic Sand Release Finish:
 - 1. Immediately after floating, spray apply chemical surface retarder to pavement according to manufacturer's written instruction
 - 2. Cover with plastic sheeting, sealing laps with tape and remove when ready to continue finishing operations.
 - 3. When concrete has taken its initial set, and after the finishing operations are completed, direct a fine spray of water at an approximate angle of 15 degrees to the surface of the concrete
 - 4. Wash the laitance and retarder from the surface without both disturbing the small aggregate and causing sand runs to appear.
 - 5. Remove laitance, retarder residue and dirty wash water from finished surfaces as soon as washing operations are complete
 - 6. Apply a dilute solution acid wash as required to kill the efflorescence.
 - a. Later applications may be stronger
 - 7. Design consolidation and finishing methods to avoid uneven settlement of aggregate above reinforcing bar locations. Uneven settlement results in uneven surface when combined with retarder application.

3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold weather protection and follow recommendations in ACE 305R for hot weather protection during curing.
- B. Curing: Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Cure concrete by one or a combination of the following methods:
 - 1. Moisture cure concrete by water, continuous fog spray, continuously wet absorptive cover, or by moisture-retaining-cover curing. Keep surfaces continuously moist for not less than seven days.
 - 2. Moisture-Retaining cover Curing: cover concrete surfaces with moisture retaining cover for curing concrete, placed in widest practical width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.6 CONCRETE SILANE SEALER

- A. Sealing: Apply in accordance with the silane sealer manufacturer's written published application instruction and as follows:
 - 1. Do not apply until construction, contraction and other joints have been sealed with elastomeric sealant
 - 2. Surfaces have been dry for a minimum of 24 hours
 - 3. Adjacent surfaces including, but not limited to plants, grass shrubs, and asphalt are masked to protect from drips and overspray.

3.7 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.
- C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 16

SECTION 32 33 00

SITE FURNISHINGS

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. Related Sections include the following:
 - 1. Division 31 Section "Earthwork" for soil materials, excavating, backfilling and site grading requirements.
 - 2. Division 32 Section "Concrete Paving" for concrete, formwork and related items.
- B. This section included the following:
 - 1. Bike Rack
 - 2. 12" wide Trench Drain Cover and frame

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
- B. Product Data: For each type of site furnishing specified, with installation instruction for each unit built-in or connected to other construction. Include methods of installation for each type of substrate.
- C. Samples for Initial Selection Purposes: Manufacturer's standard size samples showing full range of colors, textures, and patterns available for each type of site furnishing required.
- D. Submissions for Verification Purposes: Manufacturer's standard sizes for each type of site furnishing required.
- E. Shop Drawings: For each piece of site furniture, indicating dimensions, anchoring methods, color, finish, etc. Shop drawings will allow for final approval from Landscape Architect and coordination of installation by Contractor.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firm (Material Producer) with not less than three (3) years of production experience, and whose published literature clearly indicates compliance with the indicated requirements of this Section.

- B. Single Source Responsibility: Provide each required type of site furnishing as produced by a single manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original factory wrappings and/or containers, clearly labeled with identification of manufacturer, brand name and lot number (as applicable).
 - 1. Sequence delivery of site furnishings as near as practicable to required time scheduled for installation so as to minimize the required amount of onsite storage time.
 - 2. Store materials in original, undamaged packages and containers, protected from the elements, soiling and other potential sources of damage.
- B. Comply with instructions and recommendations of manufacturer for additional delivery, storage and handling requirements.

1.6 MAINTENANCE

- A. Maintenance Instructions: Submit manufacturer's printed instructions for maintenance of installed Work, including methods and frequency recommended for maintaining optimum condition under anticipated use conditions. Include precautions about materials and methods which may be detrimental to finishes and performance.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS MATERIALS

- A. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS specifications and as required for color match, strength and compatibility in fabricated items.
- B. Cast-in-Place Anchors: Anchors fabricated from corrosion-resistant materials with capability to sustain imposed design loads when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- C. Fasteners: Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
 - 1. Provide concealed fasteners for interconnection of site furnishings and for their attachment to other Work except where exposed fasteners are unavoidable or are manufacturer's standard fastening method. Provide tamper-proof machine screws for exposed fasteners, unless otherwise indicated or approved by the Landscape Architect.

2.2 FABRICATION, GENERAL

- A. Provide site furnishing items, permanently installed, equipped with functions as specified. Fabricate units with tight seams and joints, exposed metal edges rolled. Provide products with smooth welds, consistent finish with no evidence of wrinkling, chipping, uneven coloration, dents or other imperfections.

2.3 SITE FURNISHINGS

- A. Bike Rack
- B. Bike Rack
 - 1. Manufacturer: Reliance Foundry, 1-877-789-3245 Surrey, British Columbia, Canada
 - 2. Model: R-8224-SS
 - 3. Mounting: surface mount; contractor to provide all hardware needed to install per manufacturer's recommendations
 - 4. Color: Stainless Steel
 - 5. Grade: 316
 - 6. Quantity: 5 per drawing
- C. 12" Trench Drain Cover
 - 1. Manufacturer: Urban Accessories www.urbanaccessories.com Local Rep: Spruce and Gander 760.690.4083
 - 2. Model: Prospect
 - 3. Size: 12" x 5.-6" length – verify in field measurements and coordinate with inlet product
 - 4. Material: Recycled Grey Iron
 - 5. Finish: Rust conditioner
 - 6. Provide standard frame as recommended by manufacturer

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages and setting drawings, diagrams, templates, instructions and directions for installing items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the Project site.

3.2 INSTALLATION, GENERAL

- A. Provide anchorage devices and fasteners where necessary for securing site furnishings to in-place construction.
- B. Provide all necessary measures to ensure that furnishings are not scarred or blemished during handling, storage, and installation. Powder-coated finishes are baked-on at extremely high temperatures and inherently require controlled, shop-

type conditions to achieve durability. Field-repaired finishes are considered an inferior final finish and may result in the full replacement of the furnishing(s).

- C. As required, and in accordance with manufacturer's written recommendations, perform drilling and fitting to install units. Set units accurately in location, alignment and elevation, plumb, level and true, measured from established lines and levels. Provide temporary bracing or anchors in form work for items that are to be built into concrete, masonry or similar construction.
- D. Fit exposed connections accurately together to form tight, hairline joints. If cutting, welding and/or grinding is required for proper shop fitting and joining of site furnishings, restore finishes to completely eliminate any evidence of such corrective Work.
 - 1. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.

3.3 INSTALLATION

- A. Verify that materials are those specified before installing. Inspect site furnishings to insure that all units are complete, including fasteners, anchoring devices and/or accessories required for installation as shown and indicated.
- B. Coordinate installation of site furnishings with related Work to insure that units will be undamaged at time of acceptance of Work. Provide temporary protective covering for units to avoid damage during the remainder of the construction period. Remove any temporary coverings at time of Substantial Completion.
- C. Remove and replace all damaged or defective items at no additional cost to the Owner. Clean and polish exposed surfaces using materials and methods as recommended by the manufacturer.

END OF SECTION 32 33 00

SECTION 32 92 00

SEEDED LAWNS

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 the following:
 - 1. Seeding
 - 2. Hydroseeding
- B. Related Sections
 - 1. Division 32 Section 32 93 00 "Plants" for border edgings.

1.3 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 topsoil; 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.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Certificates: For soil amendments and fertilizers, signed by product manufacturer.
- C. Qualification Data: For landscape installer.
- D. Material Test Reports: For existing surface soil, manufactured or imported topsoil and planting soil mixes.
- E. Planting Schedule: Indicating anticipated planting dates for each type of planting.

- F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.
- B. Installer's Field Supervision: Installer shall maintain an experienced full-time supervisor on Project site when planting is in progress.
- C. 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.
- D. Topsoil and Planting Soil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter (oven-dried weight); gradation of sand, silt, and clay content; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
1. Provide particle size analysis according to the following gradient of mineral content:

<u>USDA Designation</u>	<u>Size in mm</u>
Gravel	+2 mm
Very coarse sand	1 - 2 mm
Coarse sand	0.5 – 1 mm
Medium sand	0.25 – 0.5 mm
Fine sand	0.1 – 0.25 mm
Very fine sand	0.05 – 0.1 mm
Silt	0.002 – 0.05 mm
Clay	Smaller than 0.002 mm

2. 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 and to comply with the following ideal percentages of base saturation and pH:

<u>Element</u>	<u>Desired Percentage Range</u>	<u>Ideal Percentage</u>
Ca	60 – 70	68
Mg	10 – 20	12
K	2 – 5	5
Na	0.5 – 3.0	0.75
Other Bases (variable)	2 – 4	3.75
Exchangeable Hydrogen	4 – 10	-
pH	6.3 – 6.8	6.5

- E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Amendments: Protect materials from weather, damage, injury and theft.
- B. Prohibit vehicular and pedestrian traffic on or around stockpiled soil.
- C. Handle soil materials only when the moisture content is less than field capacity. Do not handle, haul, place, or compact when soil is wet or frozen.

1.7 SCHEDULING

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Spring Planting: April 15 to May 15.
 - 2. Fall Planting: August 15 to September 15.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.8 LAWN MAINTENANCE

- A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 - 1. Seeded Lawns: 3 months from date of Substantial Completion.
 - a. If the full maintenance period has not elapsed prior to October 30th, or if lawn is not fully established, continue the balance of the maintenance period the following spring beginning March 1st.
- B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn.
 - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.
- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches (100 mm).
 - 1. Schedule watering to prevent wilting, ponding, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 - 2. Water lawn at a minimum rate of 1 inch (25 mm) per week.
- D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 40 percent of grass height. Remove no more than 40 percent 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.
 - 2. Mow grass 2.5 to 3 inches high.
- E. Lawn Post-fertilization: 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 lawn area.

PART 2 - PRODUCTS

2.1 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: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 15 percent weed seed:
 1. Permanent Seeding: Barenbrug Turf Saver with RTF or an approved Rhizomatous Tall Fescue Mix
 - a. Bar Fa 7676 (RTF) Tall Fescue 40%
 - b. Barrington Tall Fescue 20%
 - c. Barvado Tall Fescue 20%
 - d. Barrobusto Tall Fescue 20%
 2. Seeding Rates
 - a. 10-15 lbs/1000 s.f. for newly seeded areas

2.2 PLANTING SOILS

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7.2, 3-5 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 shall be minimum 4" deep or greater in lawn areas with 12" depth of native soil broken up and tilled
 2. The Landscape Contractor shall be responsible for amending all soils on-site to achieve these criteria.
 - a. Topsoil Source: Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.
 - b. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - c. Provide independent testing data at the Owner's request to validate the final topsoil characteristics after amendments and finish grading.

2.3 INORGANIC SOIL AMENDMENTS

- A. As required by the Topsoil Analysis.
- B. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
 1. Class: Class T, with a minimum 99 percent passing through No. 8 (2.36-mm) sieve and a minimum 75 percent passing through No. 60 (0.25-mm) sieve.

2. Provide lime in form of dolomitic limestone.
- C. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 10 percent passing through No. 40 (0.425-mm) sieve.
- D. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- E. Aluminum Sulfate: Commercial grade, unadulterated.
- F. Perlite: Horticultural perlite, soil amendment grade.
- G. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- H. Sand: ASTM C33, clean, washed, natural or manufactured, free of limestone, shale, and slate particles, free of toxic materials and with following particle size distribution:

<u>Sieve</u>	<u>Percentage Passing</u>
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 - 100
No. 8 (2.36 mm)	80 - 100
No. 16 (1.18 mm)	50 - 85
No. 30 (0.60 mm)	25 - 60
No. 50 (0.30 mm)	10 - 30
No. 100 (0.15 mm)	2 - 10

2.4 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-inch (25-mm) sieve; 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. Bulk Density: 800 to 1000 pounds per cubic yard.
 3. Feedstock: Agricultural, food, or industrial residuals; yard trimmings; or source-separated or compostable mixed solid waste.
 4. Metals and Contaminants: Meet or exceed US EPA Standard 40.
- B. 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.
- C. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
- D. 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.

2.5 PLANTING ACCESSORIES

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

2.6 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: 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.

2.7 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- 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; 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.
- C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- D. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- E. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.8 EROSION-CONTROL MATERIALS (also see Erosion Control Specification 312513)

- 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 Fiber Mesh: Biodegradable twisted jute 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

3.1 EXAMINATION

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

3.2 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 overspray.
- 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.

3.3 LAWN PREPARATION

- A. Limit lawn subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply fertilizer directly to subgrade before loosening.
 - 2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, 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 two days.
 - b. Mix lime with dry soil before mixing fertilizer.
 - 3. Spread planting soil mix to a minimum depth of 4 inches (100 mm), 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 one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches (50 mm) of subgrade. Spread remainder of planting soil mix.
 - b. ALL SOIL AT WALK EDGES SHALL BE TAMPED AND REFILLED TO WITHIN ½" OF TOP OF WALK. ANY SOIL SETTLING RESULTING IN SOIL

BEING MORE THAN 1" BELOW TOP OF PAVEMENT SHALL BE SUPPLEMENTED WITH ADDITIONAL SOIL AND RESEDED.

- C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing vegetation. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least of 6 inches (150 mm). Apply 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 of fine texture.
 - a. Apply fertilizer directly to surface soil before loosening.
 - 3. Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, vegetation, and turf, off Owner'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 fine grading to areas that can be planted in the immediate future.
- E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 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 homogeneous slurry suitable for hydraulic application.
 - 1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
 - 2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre (15.6-kg/92.9 sq. m) dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.5 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
 - 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 - 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 - 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).
 - 1. Schedule 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. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.
- C. Mow turf 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 turf-type tall fescue to a height of 2.5 to 3 inches (50 to 75 mm).
- D. Turf Post-fertilization: Apply fertilizer after initial mowing and when grass is dry.
 - 1. Use fertilizer that will provide actual nitrogen of at least 1.5 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) to turf area.

3.6 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
 - 1. **Satisfactory Seeded Turf: 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 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).**
 - 2. **LAWN MAINTENANCE BY CONTRACTOR SHALL BE REQUIRED UNTIL A SATISFACTORY LAWN IS ESTABLISHED AS DEFINED ABOVE. THIS MAINTENANCE PERIOD SHALL EXTEND INTO THE NEXT GROWING SEASON AS NEEDED.**
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.7 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf 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 plantings are established.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 32 93 00

PLANTS

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 the following:
 - 1. Trees.
 - 2. Shrubs.
 - 3. Ground covers and Perennials
 - 4. Ornamental Grasses.
- B. Related Sections include the following:
 - 1. Division 1 Section Alternates
 - 2. Division 31 Section "Earthwork" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.

1.3 REFERENCES

- A. Federal, State and local laws and regulations governing this Work are hereby incorporated into and made part of this Section. When this Section calls for certain materials, workmanship, or a level of construction that exceeds the level of Federal, State, or local requirements, provisions of this Section take precedence.
 - B. American Society for Testing and Materials (ASTM).
 - 1. ASTM C33- 07- Standard Specification for Concrete Sand.
 - 2. ASTM D422-63- Test Method for Particle-Size Analysis of Soils.
 - 3. ASTM D1557- Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 4. ASTM D2974-87 Method C – Test Method for Moisture, Ash, and Organic Matter of Peat and other Organic Soils.
 - 5. ASTM D4972 – 95a – Test Method for pH of Soils.
- C. American Nursery & Landscape Association (ANLA).
- D. American National Standards Institute (ANSI)
 - 1. ANSI Z60.1 – American Standards for Nursery Stock.
- E. International Code of Botanical Nomenclature (ICBN).

- F. International Code of Nomenclature of Cultivated Plants (ICNCP).
- G. U. S. Compost Council
 - 1. Test Methods for the Examination of Composting and Compost (TMECC)

1.4 DEFINITIONS

- A. Balled and Burlapped Stock (B&B): Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than 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.
- B. 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 kind, type, and size of exterior plant required.
- C. Finish Grade: Elevation of finished surface of planting soil.
- D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- E. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- F. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Certificates: For each type of manufactured product, signed by product 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.
- C. Qualification Data: For landscape installer.
- D. Material Test Reports: For existing surface soil, imported topsoil, and final amended topsoil.
- E. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- F. 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.

1.6 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 exterior 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: The Landscape Contractor shall provide soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; deleterious material; pH; and mineral and plant-nutrient content of topsoil. Amend as required.
 - 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," and grown in USDA Hardiness Zone 5 within 500 miles of the project site.
- 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 6 inches (150 mm) above ground for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- F. Observation: Landscape Architect may observe trees and shrubs at place of growth before shipping for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect 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 Landscape Architect of sources of planting materials ten (10) working days in advance of scheduled delivery to site. Digital photographs at the nursery may be provided to the Landscape Architect with prior approval in lieu of observation at place of growth
- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Stake locations for an on-site meeting with the Owner's Representative

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.
- C. Deliver new plants freshly dug, unless otherwise indicated.
- D. Do not prune trees and shrubs before delivery, except as approved by Landscape Architect. 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.
- E. Anti-Desiccant:
1. Spray plant material in full leaf immediately before transporting with anti-desiccant.
 2. Meet requirements of anti-desiccant manufacturer's current printed application instructions.
- F. Handle planting stock by root ball.
- G. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.
1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
 2. Do not remove container-grown stock from containers before time of planting.
 3. 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.

1.8 COORDINATION

- A. Planting Restrictions: Plant during the preferred periods that follow. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
1. Spring Planting: March 15 to May 15.
 2. Fall Planting: October 15 to December 15.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.
- C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Landscape Architect.
1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.9 WARRANTY

- A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.
 - 1. Warranty Period for Trees and Shrubs: One (1) year from date of Substantial Completion.
 - 2. Remove dead plants immediately. Replace immediately unless required to plant in the succeeding planting season.
 - 3. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - 4. A limit of one replacement of each plant will be required, except for losses or replacements due to failure to comply with requirements.

1.10 MAINTENANCE

- A. Trees and Shrubs: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.
 - 1. Maintenance Period: Three (3) months from date of Substantial Completion.
 - a. If the full maintenance period has not elapsed prior to November 30th, continue the balance of the maintenance period the following spring beginning March 1st.
 - b. If material is installed in the fall such that maintenance activities are not required until the following growing season, the full maintenance period shall begin March 1st.

PART 2 - PRODUCTS

2.1 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. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.
- C. Each tree and shrub shall come from the nursery with securely attached, waterproof tag bearing legible designation of botanical and common name and cultivar. ALL TAGS, BINDINGS, RIBBONS, AND FLAGS SHALL BE REMOVED PRIOR TO SUBSTANTIAL COMPLETION.
- D. 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.

2.2 DECIDUOUS SHRUBS

- A. Form and Size: Deciduous 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. Provide balled and burlapped or container-grown shrubs.

2.3 SUBSTITUTIONS

- A. Requirements of this Section except that plants larger than specified may be used, if accepted in writing by the Owner's Representative.

2.4 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7.2, 3-5 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 shall be 18" deep or greater in landscape beds
 - 2. The Landscape Contractor shall be responsible for amending all soils on-site to achieve these criteria.
 - a. Topsoil Source: Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.
 - b. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - c. Provide independent testing data at the Owner's request to validate the final topsoil characteristics after amendments and finish grading.

2.5 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: Class T, with a minimum 99 percent passing through No. 8 (2.36-mm) sieve and a minimum 75 percent passing through No. 60 (0.25-mm) sieve.
 - 2. Provide lime in form of dolomitic limestone.
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 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.

2.6 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-inch (25-mm) sieve; 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.
- B. 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.
- C. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
- D. 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.

2.7 FERTILIZER

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 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.

2.8 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: Premium Shredded hardwood, natural color

2.9 STAKES AND GUYS

- A. Stakes: “Duckbill” or equal approved prior to bidding.
- B. Guy and Tie Wire: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch (2.7 mm) in diameter.
- C. Guy Cable: 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.
- D. Hose Chafing Guard: 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.
- E. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 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 exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner Representative’s acceptance of layout before planting. Make minor adjustments as required.

3.3 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth of 6 inches (150 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 1. Apply fertilizer directly to subgrade before loosening.
 - 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.

2. Spread planting soil mix to a depth of 12 inches (300 mm) but not less than required 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 4 inches (100 mm) 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. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.4 TREE AND SHRUB EXCAVATION

- 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.
 2. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
 3. If drain tile is shown or required under planted areas, excavate to top of porous backfill over tile.
- B. Subsoil removed from excavations may **not** be used as backfill.
- C. Obstructions: Notify Owner Representative's if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
 1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes 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 Landscape Architect 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.

3.5 TREE AND SHRUB PLANTING

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.
 1. Remove burlap and wire baskets from tops 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.

- B. Set container-grown stock plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.
 - 1. Carefully remove root ball from container without damaging root ball or plant.
 - 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 (75-mm) average thickness of organic mulch extending 12 inches (300 mm) beyond edge of planting pit or trench.
- D. Provide a spade edge to separate lawn areas from planting beds. Refer to drawings for detail.

3.6 TREE AND SHRUB PRUNING

- A. Prune, thin, and shape trees and shrubs as directed by Landscape Architect.
- B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are sizes after pruning.

3.7 PLANTING BED MULCHING

- A. Mulch backfilled surfaces of planting beds and other areas indicated.
 - 1. Organic Mulch: Apply 3-inch (75-mm) average thickness of organic mulch, and finish level with adjacent finish grades. **Do not place mulch against plant stems and tree trunks.**

3.8 CLEANUP AND PROTECTION

- A. During exterior 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 exterior planting.

3.9 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