January 8, 2016

ADDENDUM NO. 1
2014PW0057T TAP-5901 (805)

PROJECT: MAIN AVENUE STREETSCAPE – PHASE 1
BID OPENING: 10:30 a.m., January 22nd – Bush Building 2nd Floor ***ROOM 285***, City of Springfield, Missouri

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This addendum forms a part of the Bid Documents for the project described above. The original Bid Documents and any prior addenda remain in full force and effect except as modified by the following, which shall take precedence over any contrary provision in the prior documents. The following clarifications are made:

Pre-bid meeting agenda and sign-in sheet are attached to this addendum.

Bid Documents, Specifications & Plan Sheets:

1. **Revised Form of Proposal**, which is included and has been updated to reflect the following changes:
   a. **Schedule C – New Street & Sidewalk Construction**
      1. Item C10: *Concrete Bollard.* New Bid item
   b. **Schedule E – New Landscape Construction**
      1. Item E2: *Provide and Install 2x Silva Cell 2 (includes excavation, hardware, soil fill, and aggregate).* Modified description
      2. Item E3: *Provide and Install 3x Silva Cell 2 (includes excavation, hardware, soil fill, and aggregate).* Modified description for new size Silva cell.

2. **Revised Job Special Provisions**, which are included.
   a. Silva Cell: Has been included to provide more information regarding 2x & 3x Silva Cells.
   b. Silva Cell Soil: Has been included to provide more information regarding the planting soil within the Silva Cells.

Clarifications:

1. **Bid Location:** BIDS WILL BE OPENED IN ***ROOM 285*** OF THE BUSCH BUILDING. Bid date and time will remain the same.
2. **Traffic Control**, pedestrian traffic control shall allow for east or west side of the sidewalk to be open at all times. Maintain access to driveways at all time, underground parking garage will need 48 hours notice before driveway is removed and replaced.
3. **Pavement Alternates**
   a. Concrete pavement shall be 7" thick with 12' joint spacing. Contractor will be responsible for providing jointing plan. Please refer to City of Springfield Public Works Design Guide – Chapter 9.1 for Pavement smoothness requirements.

In order to have a valid bid proposal, this addendum must be acknowledged and returned with your bid proposal.

If you have any questions concerning this addendum, please feel free to contact Jonathan Peitz at (417) 864-1994.

Jonathan Peitz, EIT
Public Works Department
City of Springfield, Missouri

Acknowledgement by Bidder:

_____ _____
Representative Date

_____
Company

CITY OF SPRINGFIELD
PUBLIC WORKS DEPARTMENT
840 North Boonville Avenue
Springfield, MO 65802

Main Avenue Streetscape - Phase 1
2014PW0057T
TAP-5901 (805)

FORM OF PROPOSAL

To: City of Springfield
Public Works Department
840 North Boonville Avenue
Springfield, MO 65802

From: _____, hereinafter called the "Bidder", having contract examined and being fully informed and familiar with the local conditions and with the contract documents including the drawings, the Notice to Contractor, Instructions to Bidders, the General Conditions and the body of the technical specifications including:

Addenda Number _____ through _____ inclusive

Hereby offer to furnish all labor, supervision, materials, equipment, tools, services and all other items necessary for the performance and the completion of the construction described in the contract documents known as Main Avenue Streetscape - Phase 1 in accordance with the PLANS AND SPECIFICATIONS, heretofore filed in the Director of Public Works office (2014PW0057T), at the following prices to be paid in cash, to-wit:

SCHEDULE A - GENERAL

ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
A1	Mobilization, Bonds	1	LS	$	$
A2	Miscellaneous Utility Adjustments	1	LS	$	$
A3	Curbed Gutter Inlet Protection on Grade	9	EA	$	$
A4	Curbed Gutter Inlet Protection on Sump	2	EA	$	$
	SCHEDULE A SUBTOTAL			**$**	

SCHEDULE B - DEMOLITION BASE BID					
ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
B1	Demolition and Removals	1	LS	$	$
B2	Underground and Miscellaneous Removals	1	LS	$	$
SCHEDULE B SUBTOTAL				**$**	

SCHEDULE C - NEW STREET AND SIDEWALK CONSTRUCTION					
ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
C1	2' 6" Wide Concrete Curb and Gutter with 6" wide Curb (including 4" aggregate base, tie-bars as required)	497	LF	$	$
C2	2' 9" Wide Concrete Curb and Gutter with 9" wide Curb (including 4" aggregate base, tie-bars as required)	153	LF	$	$
C3	4" Concrete Sidewalk (including 4" aggregate base)	1114	SY	$	$
C4	8" Concrete Driveway Approach (including 4" Aggregate Base, curb)	635	SY	$	$
C5	Concrete ADA Curb Ramps - (including 6" thick concrete on 4" aggregate base, concrete flares, concrete curb on back of sidewalk, and ADA detectable warning strips with grout complete in place)	221	SF	$	$
C6	8" Tinted Concrete Cycle Track (including 4" Aggregate Base)	311	SY	$	$
C7	Sidewalk Underdrain	61	LF	$	$

C8	Furnish & Install Concrete Foundation Street/Pedestrian Light Base, Includes Anchor Bolts and Ground	12	EA	$	$
C9	Concrete Textured Pavement in Crosswalks	36	SY	$	$
C10	Concrete Bollard	1	EA	$	$
SCHEDULE C SUBTOTAL				**$**	

SCHEDULE D - NEW STORMWATER CONSTRUCTION					
ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
D1	SS-1 Junction Box (4'x4')	1	EA	$	$
D2	SS-1 (Modified) Junction Box (6.5'x6.5')	1	EA	$	$
D3	SS-3 Non-Recessed Curb Inlet (4'x8')	1	EA	$	$
D4	Combination Curb Inlet (4'x2.5')	2	EA	$	$
D5	Combination Curb Inlet (4'x6')	3	EA	$	$
D6	Combination Curb Inlet (6'x6')	1	EA	$	$
D7	12" HPP (Including Pavement Repair, Gaskets)	147	LF	$	$
D8	15" Storm Pipe (Including Pavement Repair, Gaskets)	5	LF	$	$
D9	18" Storm Pipe (Including Pavement Repair, Gaskets)	110	LF	$	$

D10	24" Storm Pipe (Including Pavement Repair, Gaskets)	23	LF	$	$
D11	48" Storm Pipe (Including Pavement Repair, Gaskets)	210	LF	$	$
D12	8'x4' Precast Concrete Box Culvert	120	LF	$	$
D13	18" Drainage Basin w/ Standard Lid	3	EA	$	$
SCHEDULE D SUBTOTAL				**$**	

SCHEDULE E - NEW LANDSCAPE CONSTRUCTION					
ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
E1	Seed & Mulch (Miscellaneous Areas)	1	LS	$	$
E2	Provide and Install 2x Silva Cell 2 (includes excavation, hardware, soil fill and aggregate)	12	EA	$	$
E3	Provide and Install 3x Silva Cell 2 (includes excavation, hardware, soil fill and aggregate)	69	EA	$	$
E4	Planting Bed Soil Non-Silva Cell 2 Area	75	CY	$	$
E5	2" PVC and 6" PVC Parallel Sleeves for Irrigation - Buried	825	LF	$	$
E6	4" PVC Sleeve for Irrigation - Burried	116	LF	$	$
E7	1" Slotted Sch. 40 PVC Vent Pipe Sleeve for Irrigation - Buried	157	LF	$	$
E8	Preformed Irrigation Handhole LI-8	14	EA	$	$

E9	Rain Garden Soil Media	32	CY	$	$
E10	Rain Garden Open Graded Aggregate	20	CY	$	$
E11	4'x2.5' Vault for Backflow Preventer & Blow-Off Valve	1	EA	$	$
E12	Grouted Cobbles	114	SF	$	$
E13	2" Irrigation Meter	1	EA	$	$
SCHEDULE E SUBTOTAL				**$**	

SCHEDULE F - TEMPORARY TRAFFIC CONTROL					
ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
F1	Temporary Crosswalk Striping	120	LF	$	$
F2	Channelizer (Trim Line)	17	EA	$	$
F3	Type III Moveable Barricade w/ Type B Warning Lights	12	EA	$	$
F4	Road Work Ahead (W20-1) 36"x36" - 3 Total	27	SF	$	$
F5	Road Closed Ahead (W20-3) 36"x36" - 3 Total	27	SF	$	$

F6	Sidewalk Closed (R9-9) 12"x24" - 4 Total	8	SF	$	$
F7	Sidewalk Closed Ahead Cross Here (R9-11L) 12"x24" - 1 Total	2	SF	$	$
F8	Sidewalk Closed Ahead Cross Here (R9-11R) 12"x24" 2 Total	4	SF	$	$
F9	Road Closed (R11-2) 48"x30" - 8 Total	80	SF	$	$
F10	End Road Work (G20-2) 36"x18" - 2 Total	9	SF	$	$
SCHEDULE F SUBTOTAL				**$**	

SCHEDULE G - CITY UTILITIES ELECTRIC RELOCATIONS					
ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
G1	Remove Concrete Foundation	2	EA	$	$
G2	Install Secondary Pedestal (SP-2C)	3	EA	$	$
G3	Furnish/Install Secondary Riser (SR-2CP)	1	EA	$	$
G4	Furnish/Install 1-2" PVC Conduit in Trench	524	FT	$	$
G5	Furnish/Install 1-2" GALV Conduit in Trech	341	FT	$	$
G6	Furnish/Install p224 (PVC Elbow)	33	EA	$	$

G7	Furnish/Install G236 (GALV Elbow)	8	EA	$	$
	SCHEDULE G SUBTOTAL			**$**	

TOTAL BASE BID (SCHEDULES A+B+C+D+E+F+G)	**$**

SCHEDULE H - PAVEMENT ALTERNATES

ITEM NO.	DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
ROADWAY PAVEMENT: ASPHALT					
H1	2" Asphalt Surface	1957	SY	$	$
H2	8" Asphalt Base	1957	SY	$	$
H3	6" Aggregate Base	1957	SY	$	$
	ASPHALT ALTERNATE TOTAL			**$**	
ROADWAY PAVEMENT: CONCRETE					
H4	7" Non Reinforced PCCP	1957	SY	$	$
H5	4" Aggregate Base	1957	SY	$	$
	CONCRETE ALTERNATE TOTAL			**$**	

LOWEST PAVEMENT ALTERNATE	**$**

TOTAL BASE BID + LOWEST PAVEMENT ALTERNATE	**$**

Note 1 Accompanying the proposal is a certified or cashier's check or acceptable bidders bond in the amount of or five (5) percent of the amount of this bid, payable to the City of Springfield - Public Works Dept., which is in accordance with the provisions in the instructions to bidders. It is agreed that if the successful bidder fails to execute and deliver the agreement and furnish the required contract security within ten (10) days after the Notice of Award, the engineer may annul the Notice of Award and the bid security of that bidder will be forfeited.

Note 2 It is understood by the undersigned that the quantities given in the itemized proposal are not guaranteed and are used solely for the purpose of comparing bids and awarding the contract, and may or may not represent the actual quantities encountered on the job. The gross sum bid shall be based upon the given itemized quantities multiplied by the unit prices shown herein. In the event of a discrepancy between the unit prices and the gross sum bid, the unit prices will prevail. The undersigned agrees that payment will be on the basis of the unit prices shown herein, and shall be made on quantities actually constructed and verified by field measurement.

The undersigned agrees to complete the work specified herein in accordance with the contract unit prices, whether it involves quantities greater or less than those indicated in this Bid Proposal and agrees that the proposed quantities could not in any way be construed to misrepresent earth, rock, or groundwater quantities in the scope of work proposed.

Bidder agrees and understands that by this submission that items required, but not shown on proposal, shall be included in the bid price for other items such as, but not limited to, excavation, ditching, backfilling, or installation of bedding material.

Note 3 The undersigned submits the following itemized proposal and hereby authorizes the Director of Public Works to correct any multiplication of "Unit Price" by "Quantity" as shown under "Amount" when copying the itemized proposal sheet(s) into any contract.

Note 4 Bidder agrees that payment will be in cash as follows: On the 22nd day of each month, the Engineer will measure and compute the amount of work performed during the month and the value thereof at the contract unit price. On or about the 20th day of the month following, the Contractor shall be paid an amount equal to the value of the work performed less a retained amount of five (5) percent until construction is complete.

Note 5 The undersigned agrees that if awarded the contract for the work, the contract will be signed and satisfactory bonds filed within ten (10) days after notice of intent to award.

Note 6 It is understood that this bid becomes a part of the specifications upon the signing of the contract and that failing to comply with any part of this bid will be taken as a failure to comply with said specifications and will be just cause for rejection of work.

Note 7 As a condition of submitting this bid and in consideration of the City permitting the bid to be submitted, the bidder hereby agrees that this bid shall be irrevocable for a period of sixty (60) days and that the bid shall not be withdrawn during the sixty (60) day period from the date of the bid opening specified in the bid notice.

Note 8 In submitting this bid, it is understood that the right is reserved by the City of Springfield to reject any and all bids, to waive any irregularities in the bidding, and to increase or decrease the amount of any class or portion of the work.

Note 9 In submitting this proposal, contractor certifies that no employee, member, or officer of the firm or corporation is a salaried officer or employee of the City of Springfield or any of its boards or agencies, and that no salaried officer or employee of the City has any financial interest, direct or indirect, in this Contract.

Note 10 The undersigned, as bidder, understands that the bidder awarded the contract will be required to comply, and to cause his subcontractors, if any, to comply with all federal statutes, regulations, and directives against discrimination against any person in connection with the contract, on account of race, color or national origin, and that such discrimination extends to procurement of materials and lease of equipment for use in connection with the contract.

Note 11 The undersigned, as bidder, declares that the only persons or parties interested in this proposal as principal are those named herein; that this proposal is made without directly or indirectly entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with such bid of any contract which may result from its acceptance or combination of any kind or character with any other person, firm, association, or corporation, or any member or officer thereof. Bidder further certifies that the person, firm, association, or corporation making said bid is not financially interested in, or financially affiliated with, any other bidder for this Proposal; that he has carefully examined the location of the proposed work, the plans, standard specifications, and special provisions heretofore mentioned, and the form of contract and contract bond; that he proposed and agrees, if this proposal is accepted, to execute the contract and bond and secure execution of the bond by satisfactory surety and to provide all necessary machinery, tools, apparatus, and other means of construction, and will do all the work and furnish all the materials specified in the contract, in the manner and time prescribed and in accordance with the requirements of the engineer as therein set forth, and that he will accept in full payment therefore the amount or amounts certified by the engineer in accordance with the bid, specifications, and contract.

Note 12 It is understood by the undersigned, that the work to be performed under the provisions of these Contract Documents and the unit and lump sum prices named in this Proposal and the Contract based thereon shall cover the furnishing of all materials (except materials specified to be furnished by the Owner), equipment, supplies and appurtenances, all construction plant, equipment and tools, the performance of all necessary labor, supervision and services and the construction complete as indicated by and detailed on the contract plans and as stipulated in the contract specifications and other contract documents.

The scope of the work to be performed under the various unit and lump sum prices of the contract proposal is in general, defined and described under the respective applicable specification sections. It is the intent of the Proposal Form and the Special Provisions that the total bid as submitted shall cover all work shown by the Contract Drawings and as required by the attached specifications and other Contract Documents. All cost in connection with the work, and payment therefore, shall be included in and based on the unit and lump sum prices named in the Proposal. No item of work that is required by the Contract documents for the proper and successful completion of the contract shall be paid for outside of or in addition to the prices submitted in the Proposal, as all work not specifically set forth in the Proposal as a pay item shall be considered a subsidiary obligation of the Contractor and all cost in connection therewith shall be included in the unit or lump sum prices named in the Proposal.

Note 13 SIGNATURE AND IDENTITY OF BIDDER: The undersigned states that the correct LEGAL NAME and ADDRESS of (1) the individual bidder, (2) each partner or joint venture (whether individuals or corporations, and whether doing business under a fictitious name), or (3) the corporation (with the state in which it is incorporated) are shown below; that (if not signing the intention of binding himself to become the responsible and sole contractor) he is the agent of, and duly authorized in writing to sign for the bidder or bidders; and that he is signing and executing this (as indicated in the proper spaces below) as the proposal of a:

( ) sole individual ( ) partnership ( ) joint venture

( ) corporation, incorporated under laws of State of Missouri

Dated _____, 20_____

Respectfully submitted,

_____

Doing business under the name of: _____
(If using a fictitious name show this name above in addition to legal name.)

(IF AN INDIVIDUAL)

Signature of Bidder _____

Business Address _____

_____

Telephone Number _____

(IF A CORPORATION OR JOINT VENTURE)

Firm Name _____ (SEAL)

Signed by _____ (SEAL)

Business Address _____

_____

Telephone Number _____

Insert Name and Address of all Members of the firm _____

_____

_____

(IF A CORPORATION)

Corporate Name _____

(CORPORATE SEAL)

Signed by _____

President

Principal Place of Business in Missouri

_____

_____

Telephone Number _____

Insert Names of Officers

Attest: _____

(Secretary)

State of Incorporation

_____

NOTE: If the bidder is doing business under a FICTITIOUS NAME, the proposal shall be executed in the legal name of the individual, partners, joint ventures, or corporation, with no legal address shown, and REGISTRATION OF FICTITIOUS NAME filed with the Secretary of State, as required by Sections 417.200 to 417.230 RSMo. If the bidder is a CORPORATION NOT ORGANIZED UNDER THE LAWS OF MISSOURI, it should procure a CERTIFICATE OF AUTHORITY TO DO BUSINESS IN MISSOURI, as required by Section 315.570 and following RSMo. A CERTIFIED COPY of such Registration of Fictitious Name or Certificate of Authority to do Business in Missouri shall be filed with the City of Springfield, Missouri.

SECTION 32 94 51
SOIL CELLS
("SILVA CELL 2" SYSTEM)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Silva Cell system for planting and paving, including Silva Cell assemblies and related accessories.
   2. Other materials including, but not limited to, geotextile, geogrid, aggregate, subbase material, backfill, root barrier, and planting soil.

B. Materials Installed But Not Furnished Under This Section:
   1. Planting soils are furnished in Section 32 94 56 - Planting Soil for Silva Cells.

C. Related Requirements:
   1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.
   2. JSP-09 – Submittal Procedures: For administrative and procedural requirements for processing of submittals during the construction phase.
   3. City of Springfield General Conditions and Technical Specification for Public Improvements – Closeout Procedures: For administrative and procedural requirements for completion of the Work.
   4. Section 32 94 56 – Planting Soil for Soil Cells (Silva Cells)

1.02 REFERENCES

A. Definitions:
   1. AGGREGATE BASE COURSE: Aggregate material between the paving and the top of the Silva Cell deck below, designed to distribute loads across the top of the deck.
   2. AGGREGATE SUBBASE: Aggregate material between the bottom of the Silva Cell base and the compacted subgrade below, designed to distribute loads from the Silva Cell bases to the subgrade.
   3. BACKFILL: The earth used to replace or the act of replacing earth in an excavation beside the Silva Cell system to the excavation extents.
   4. FINISH GRADE: Elevation of finished surface of planting soil or paving.
   5. PLANTING SOIL: Soil as defined in Section 32 94 56 - Planting Soil for Silva Cells, intended to fill the Silva Cell system and other planting spaces.
   6. SILVA CELL SYSTEM:
      a. Silva Cell: One assembled unit made up of 1 base, 6 post assemblies, and 1 Silva Cell deck.
      b. Silva Cell System: Two or more Silva Cells used in combination with each other and with required accessories.
   7. SUBGRADE: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill.
   8. WALK-THROUGH: A process for light compaction of soils by walking through the soil following placement.

B. Reference Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
   a. AASHTO H-20

2. ASTM International (ASTM):
   a. ASTM D448-12, Standard Classification for Sizes of Aggregate for Road and Bridge Construction
   b. ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 [600 kN-m/m^3])
   c. ASTM D1241-07, Standard Specification for Materials for Soil-Aggregate Subbase, Base, and Surface Courses
   d. ASTM D3786/D3786M-13, Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method
   e. ASTM D4491-99a(2014)e1, Standard Test Methods for Water Permeability of Geotextiles by Permittivity
   f. ASTM D4533-D4533M-15, Standard Test Method for Trapezoid Tearing Strength of Geotextiles
   g. ASTM D4632-D4632M-15, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
   h. ASTM D4751-12, Standard Test Method for Determining Apparent Opening Size of a Geotextile
   i. ASTM D4833/D4833M-07(2013)e1, Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
   j. ASTM D5262-07(2012), Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics
   k. ASTM D6241-14, Standard Test Method for Static Puncture Strength of Geotextile and Geotextile-Related Products Using a 50mm Probe
   l. ASTM D6637-11, Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Prior to installation of the Silva Cell system and associated Work, meet at Project site with the Contractor, Silva Cell system installer and their field supervisor, manufacturer's technical representative, the Landscape Architect, Inspector, Engineer, and other entities concerned with the Silva Cell system performance.
   1. Provide at least 72 hours advance notice to participants prior to convening preinstallation conference.
   2. Introduce and provide a roster of individuals in attendance with contact information.
   3. The preinstallation conference agenda will include, but is not limited to the review of:
      a. Required submittals both completed and yet to be completed.
      b. The sequence of installation and the construction schedule.
      c. Coordination with other trades.
      d. Details, materials and methods of installation.
         1) Review requirements for substrate conditions, special details, if any, installation procedures.
         2) Installation layout, procedures, means and methods.
      e. Mock-up requirements.

B. Sequencing and Scheduling:
   1. General: Prior to beginning Work of this Section, prepare a detailed schedule of the Work involved for coordination with other trades.
   2. Schedule utility installations prior to beginning Work of this Section.

3. Where possible, schedule the installation of the Silva Cell system after the area is no longer required for use by other trades and Work. Where necessary to prevent damage, protect installed system if Work must occur over or adjacent to the installed Silva Cell system.

1.04 SUBMITTALS

A. Action Submittals: Submit these to the Engineer for review and acceptance not less than 45 days prior to start of installation of materials and products specified in this Section.
   1. Product Data: For each type of product, submit manufacturer's product literature with technical data sufficient to demonstrate that the product meets these specifications.
   2. Test and Evaluation Reports:
      a. Submit results of compaction testing required by the Specifications for approval.
      b. Include analysis of bulk materials including soils and aggregates, by a recognized laboratory that demonstrates that the materials meet the Specification requirements.
   3. Samples:
      a. One full size sample of an assembled Silva Cell.
      b. One 6-inch (150-mm) square piece of geogrid.
      c. One 6-inch (150-mm) square piece of geotextile.
   4. Manufacturer's Report: Submit Silva Cell system manufacturer's letter of review and approval of the Project, including Drawings and Specifications, Addenda, Clarifications and Modifications, and for compliance with product installation requirements.
   5. Qualification Statements:
      a. Manufacturer:
         1) Submit list of completed projects demonstrating durability and longevity of in-place systems.
            a) Include project name, location, and date of completion.

B. Closeout Submittals: Submit in accordance with City of Springfield General Conditions and Technical Specification for Public Improvements.

1.05 QUALITY ASSURANCE

A. Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary permits/approvals from these authorities.

B. Manufacturer Qualifications:
   1. A manufacturer whose product is manufactured in an ISO/TS 16949 compliant and ISO 9001 - 2008 registered factory.
   2. A manufacturer with not less than 100 Silva Cell systems in-place, each system in use for not less than 3 years, confirming durability and longevity of the system.
   3. A manufacturer with documented written approval of their product for use as a stormwater treatment device by a minimum of 3 governmental jurisdictions.
   4. A manufacturer with an established and demonstrated utility service and repair process, including written procedure and photographs demonstrating work.

C. Mock-Up: Prior to the installation of the Silva Cell system, construct a mock-up of the complete installation at the Project site in the presence of the Engineer.

1. Size and Extent: Minimum of 100 sq. ft. (9.29 sq. m.) in area and including the complete Silva Cell system installation with subbase, aggregate subbase, drainage installation, Silva Cell decks, posts, and bases, base course aggregate, geotextile, geogrid, backfill, planting soil, and necessary accessories.
2. The mock-up area may remain as part of the installed Work at the end of the Project provided that it remains undamaged and meets the requirements of the Drawings and Specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Silva Cell System: Protect Silva Cell system components from damage during delivery, storage and handling.
   1. Store components on smooth surfaces, free from dirt, mud and debris. Store under tarp, to protect from sunlight, when time from delivery to installation exceeds one week.
   2. Perform handling with equipment appropriate to the size (height) of Silva Cells and site conditions; equipment may include, hand, handcart, forklifts, extension lifts, or small cranes, with care given to minimize damage to Silva Cell bases, posts, decks and adjacent assembled Silva Cells.

B. Packaged Materials: Deliver packaged materials in original, unopened containers indicating weight, certified analysis, name and address of manufacturer, and indication of conformance with State and Federal laws, if applicable. Protect materials from deterioration during delivery and while on the Project site.

C. Bulk Materials:
   1. Do not deliver or place backfill, soils, or soil amendments in frozen, wet, or muddy conditions.
   2. Provide protection including tarps, plastic and/or matting between bulk materials and finished surfaces sufficient to protect the finish material.
   3. Bring planting soil to the site using equipment and methods that do not overly mix and further damage soil peds within the soil mix.

D. Provide erosion-control measures to prevent erosion or displacement of bulk materials and discharge of soil-bearing water runoff or airborne dust to adjacent properties, water conveyance systems, and walkways. Provide additional sediment control to retain excavated material, backfill, soil amendments and planting mix within the Project limits as needed.

1.07 FIELD CONDITIONS

A. Existing Conditions: Do not proceed with Work when subgrades, soils and planting soils are in a wet, muddy or frozen condition.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Acceptable Manufacturers:

DeepRoot Green Infrastructure, LLC
101 Montgomery Street, Suite 2850
San Francisco, CA, 94104

415.781.9700
800.458.7668
Fax 415.781.0191

www.deeproot.com

B. In General no substitutions are allowed.

2.02 DESCRIPTION

A. The term Silva Cell shall be used to refer to a single Silva Cell or a stack of Silva Cells.
B. Silva Cells shall be designed for the purpose of growing healthy trees and providing stormwater management.
C. Silva Cells shall be modular, structural systems.
D. Each Silva Cell shall be structurally-independent from all adjacent Silva Cells for incorporating utilities and other site features as well as for future repairs.
E. Silva Cells shall be capable of supporting loads up to and including AASHTO H-20 (United States) when used in conjunction with approved pavement profiles.
F. Silva Cells shall be open on all vertical faces and horizontal planes and shall have no interior walls or diaphragms.
G. Silva Cells shall be capable of providing a large, contiguous, continuous volume of planting soil that does not inhibit or prevent the following:
   1. Placement of planting soil
   2. Compaction testing of planting soil, once in place
   3. Movement and growth of roots
   4. Movement of water within the provided soil volume, including lateral capillary movement
   5. Installation and maintenance of utilities placed within, adjacent to, or below the Silva Cell.
H. Silva Cells shall be able capable of being filled with a variety of soil types and soils that include peds 2 inches (50 mm) or larger in diameter as is appropriate for the application, location of the installation, and tree species.

2.03 SILVA CELL MATERIALS AND ACCESSORIES

A. Silva Cell System Components: Each "Silva Cell 2" soil cell module (hereafter Silva Cell or "cell") is composed of one base, 6 post assemblies, and one deck.

   1. 2x Silva Cell 2 System:
      a. Components: One base, six 2x posts, and one deck.
      b. Assembled Dimensions (Each Cell): 47.2 inches long by 23.6 inches wide by 30.9 inches high (1200 mm long by 600 mm wide by 784 mm high).]

   2. 3x Silva Cell 2 System:
      a. Components: One base, six 3x posts (a combination of six 1x posts and six 2x posts), and one deck.
      b. Assembled Dimensions (Each Cell): 47.2 inches long by 23.6 inches wide by 43 inches high (1200 mm long by 600 mm wide by 1092.2 mm high).]

B. Silva Cell Materials and Fabrication:
   1. Bases and Posts: Homopolymer polypropylene.
   2. Decks: Fiberglass reinforced, chemically-coupled, impact modified polypropylene.

C. Manufacturer's Related Silva Cell Installation Accessories:
   1. Strongbacks: An accessory designed to stabilize the Silva Cell posts temporarily, during soil placement, and removed for reuse prior to placing decks.
   2. Anchoring Pins: Threaded pins and crossbar for securing assembled Silva Cells to subbase.

2.04 RELATED PRODUCTS

A. Root Barrier: Recyclable, black, injection molded panels manufactured with a minimum 50 percent post-consumer recycled polypropylene plastic with UV inhibitors, and integrated zipper joining system which allows instant assembly by sliding one panel into another; for redirecting tree roots down and away from hardscapes.
   1. Panel Sizes:
      a. No. UB12-2: 24 inches long by 12 inches deep by 0.080 inches thick (61 cm long by 30 cm deep by 2.03 mm thick); for use with 1x systems and for pavement profiles less than 12 inches (30 cm) deep.
      b. No. UB18-2: 24 inches long by 18 inches deep by 0.080 inches thick (61 cm long by 46 cm deep by 2.03 mm thick); for use with 2x and 3x systems, and for pavement profiles 12 inches or more in depth.

   2. Products meeting this specification:
      a. DeepRoot Tree Root Barrier (DeepRoot Green Infrastructure, LLC)

B. Geogrid: Net-shaped woven polyester fabric with PVC coating, uniaxial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alkalis, and acids; used to provide a stabilizing force within soil structure as the fill interlocks with the grid .
   1. Tensile strength at ultimate (ASTM D6637): 1850 lbs/ft (27.0 kN/m) minimum
   2. Creep reduced strength (ASTM D5262): 1000 lbs/ft (14.6 kN/m) minimum
   3. Long term allowable design load (GRI GG-4): 950 lbs/ft (13.9 kN/m) minimum
   4. Grid aperture size (MD): 0.8 inch (20 mm) minimum
   5. Grid aperture size (CD): 1.28 inch (32 mm) maximum
   6. Roll size: 6-foot (1.8-m) width is preferred, up to 18-foot (5.4-m).

   7. Products meeting this specification:
      a. Stratagrid SG 150, (Strata Systems, Inc.); Cumming, GA; http://www.geogrid.com
      b. Miragrid 2XT (TenCate Nicolon); Norcross, GA; http://www.tencate.com
      c. Fortrac 35 Geogrid (Huesker, Inc.); Charlotte, NC; http://www.hueskerinc.com
      d. SF 20 Biaxial Geogrid (Synteen); Lancaster, SC; http://www.synteen.com

C. Geotextile: Nonwoven polypropylene fibers, inert to biological degradation and resistant of naturally occurring chemicals, alkalis and acids; applied to either the soil surface or between materials, providing filtration, separation, or stabilization properties.
   1. Grab tensile strength (ASTM D4632): 200 lbs (900 N) minimum
   2. Elongation (ASTM D4632): 50 percent minimum
   3. Trapezoid tear strength (ASTM D4533): 80 lbs (350 N) minimum
   4. Mullen burst strength (ASTM D3786): 350 psi (2400 kPa)
   5. Puncture strength (ASTM D4833): 110 lbs (490 N) minimum
   6. CBR puncture strength (ASTM D6241): 500 lbs (2225 N) minimum
   7. Apparent opening size (ASTM D4751): 80 sieve (0.18 mm) maximum

8. Flow rate (ASTM D4491): 90 gal/min/ft^2 (3870 l/min/m^2) minimum
9. UV Resistance (at 500 hours): 70 percent strength retained

10. Products meeting this specification:
    a. ADS Geosynthetics 0801T (ADS Geosynthetics); http://www.ads-pipe.com
    b. Mirafi 180 N (TenCate Nicolon); Norcross, GA; http://www.tencate.com
    c. Geotex 801 (Propex Geosynthetics); Chattanooga, TN: http://www.geotextile.com

D. Plastic Cable Ties: A tensioning device or tool used to tie similar or different materials together with a specific degree of tension.

2.05 OTHER RELATED MATERIALS

A. Drain and Distribution Pipes: Refer to City of Springfield General Conditions and Technical Specification for Public Improvements.
B. Aggregate Subbase (Below Silva Cell Base):
   1. Aggregate shall conform to City of Springfield Type 1 Base.
C. Aggregate Base Course (Above Silva Cell Deck):
   1. Same as aggregate subbase specified above.
D. Backfill Material (Adjacent to Silva Cells): Clean, compactable, coarse grained fill soil free of organic material, trash and other debris, and free of toxic material injurious to plant growth.
E. Planting Soil: Refer to Section 32 94 56 - Planting Soil for Silva Cells.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the conditions under which the Silva Cells are to be installed.
   1. Carefully check and verify dimensions, quantities, and grade elevations.
   2. Carefully examine the Drawings to become familiar with the existing underground conditions before digging. Verify the location of aboveground and underground utility lines, infrastructure, other improvements, and existing trees, shrubs, and plants to remain including their root system.
   3. Notify the Contractor and the Engineer in writing in the event of conflict between existing and new improvements, of discrepancies, and other conditions detrimental to proper and timely completion of the installation.
   4. Obtain written approval of changes to the Work prior to proceeding. Proceed with installation only after changes have been made and unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Take proper precautions as necessary to avoid damage to existing improvements and plantings.
B. Prior to the start of Work, layout and stake the limits of excavation and horizontal and vertical control points sufficient to install the complete Silva Cell system.
C. Coordinate installation with other trades that may impact the completion of the Work.

3.03 TEMPORARY PROTECTION

A. Protect open excavations and Silva Cell system from access and damage both when Work is in progress and following completion, with highly visible construction tape, fencing, or other means until related construction is complete.
B. Do not drive vehicles or operate equipment over the Silva Cell system until the final surface material has been installed.

3.04 EXCAVATION

A. General: Excavate to the depths and shapes indicated on the Drawings. Provide smooth and level excavation base free of lumps and debris.
B. Confirm that the depth of the excavation is accurate and includes the full section of materials required to place the subbase aggregate, Silva Cell, and pavement profile as indicated on the Drawings.
C. Over-excavate beyond the perimeter of the Silva Cell to allow for:
    1. The extension of aggregate subbase beyond the Silva Cell layout as shown on the Drawings.
    2. Adequate space for proper compaction of backfill around the Silva Cell system.
D. If unsuitable subgrade soils are encountered, consult the Owner's geotechnical consultants for directions on how to proceed.
E. If conflicts arise during excavation, notify the Engineer in writing and make recommendations for action. Proceed with Work only when action is approved in writing.

3.05 SUBGRADE COMPACTION

A. Compact subgrade to a minimum of 95 percent of maximum dry density at optimum moisture content in accordance with ASTM D698, Standard Proctor Method, or as approved by the Owner’s geotechnical representative.
B. Do not exceed 7 percent slope for subgrade profile in any one direction. If the 7 percent slope is exceeded, contact manufacturer's representative for directions on how to proceed.

3.06 INSTALLATION OF GEOTEXTILE OVER SUBGRADE

A. Install geotextile over compacted subgrade.
    1. Lay geotextile flat with no folds or creases.
    2. Install the geotextile with a minimum joint overlap of 18 inches (450 mm).

3.07 INSTALLATION OF AGGREGATE SUBBASE BELOW SILVA CELL BASES

A. Install aggregate subbase to the depths indicated on the Drawings.
B. Extend subbase aggregate a minimum of 6 inches (150 mm) beyond the base of the Silva Cell layout.
C. Compact aggregate subbase to a minimum of 95 percent of maximum dry density at optimum moisture content in accordance with ASTM D698, Standard Proctor Method.
D. Do not exceed 7 percent slope on the surface of the subbase. Where proposed grades are greater than 7 percent, step the Silva Cells to maintain proper relation to the finished grade.

3.08 INSTALLATION OF SILVA CELL BASE

A. Install the Silva Cell system in strict accordance with manufacturer's instructions and as specified herein; where requirements conflict or are contradictory, follow the more stringent requirements.
B. Layout and Elevation Control:
   1. Provide layout and elevation control during installation of the Silva Cell system to ensure that layout and elevations are in accordance with the Drawings.
C. Establish the location of the tree openings in accordance with the Drawings. Once the trees are located, mark the inside dimensions of the tree openings on the prepared subbase.
D. Locate and mark other Project features located within the Silva Cell layout (e.g. light pole bases, utility pipes). Apply marking to identify the extent of the Silva Cell layout around these features. Follow the layout as shown on the Drawings to ensure proper spacing of the Silva Cell bases. Refer to the Drawings for offsets between these features and the Silva Cells.
E. Check each Silva Cell component for damage prior to placement. Reject cracked or chipped units.
F. Place the Silva Cell bases on the compacted aggregate subbase. Start at the tree opening and place Silva Cell bases around the tree openings as shown on the Drawings.
G. Working from tree opening to tree opening, place Silva Cell bases to fill in the area between tree openings.
   1. Maintain spacing no less than 1 inch (25 mm) and no more than 4 inches (100 mm) apart.
H. Follow the Silva Cell layout plan as shown on the Drawings.
I. Install Silva Cell bases around, over, or under existing or proposed utility lines, as indicated on the Drawings.
J. Level each Silva Cell base as needed to provide full contact with subbase. Adjust subbase material, including larger pieces of aggregate, so each base sits solidly on the surface of the subbase. Silva Cell bases that rock or bend over any stone or other obstruction protruding above the surface of the subbase material are not allowed. Silva Cell bases which bend into dips in the subbase material are not allowed. The maximum tolerance for deviations in the plane of the subbase material under the bottom of the horizontal beams of each Silva Cell base is 1/4 inch in 4 feet (6 mm in 1200 mm).
K. Anchor Silva Cell base with 2 crossbar/pin assemblies per base.
   1. For applications where Silva Cells are installed over waterproofed structures, use wood blocking or similar spacing system consistent with requirements of the waterproofing system to maintain required spacing.

3.09 INSTALLATION OF SILVA CELL POSTS

A. 2x Silva Cell 2 System:
   1. Attach 2x posts to the installed Silva Cell base. Each base will receive six 2x posts. Place the end of the post with tabs into the base. Rotate post clockwise to snap in place.

B. 3x Silva Cell 2 System:
   1. Attach 2x posts to the installed Silva Cell base. Each base will receive six 2x posts. Place the end of the post with tabs into the base. Rotate post clockwise to snap in place.
   2. Following the placement of backfill and planting soil within the 2x posts, add a 1x post extension as described herein. A 2x post, used in combination with a 1x post is considered a 3x post assembly.

3.10 INSTALLATION OF STRONGBACKS, GEOGRID, BACKFILL AND PLANTING SOIL

A. For Silva Cell systems that have a perforated drain line located inside or adjacent to the system, consult Drawings for layout and details.
B. Install strongbacks on top of the Silva Cell posts by snapping into place over installed posts prior to installing planting soil and backfill.
   1. Strongbacks are required only during the placement and compaction of the planting soil and backfill.
   2. Move strongbacks as the Work progresses across the installation.
   3. Remove strongbacks prior to the installation of the Silva Cell decks.
C. Install geogrid around the perimeter of the Silva Cell system where the compacted backfill and planting soil interface.
   1. Do not place geogrid between the edge of the Silva Cells and adjacent planting areas.
   2. Cut the geogrid to allow for a 6-inch (150-mm) overlap at the Silva Cell base and a 12-inch (300-mm) overlap at the Silva Cell deck.
   3. Provide a minimum 12-inch (300-mm) overlap between adjacent sheets of geogrid.
   4. Secure geogrid with cable ties below the top of the posts, along the post ridges.
D. Place the first lift of backfill material loosely around the perimeter of the Silva Cell system, between the geogrid and the sides of the excavation. Place backfill to approximately the midpoint of the Silva Cell post. Do not compact.
E. Place the first lift of planting soil in the Silva Cell system to approximately the midpoint of the Silva Cell post.
   1. Level the planting soil throughout the system.
   2. Walk-through the placed planting soil to remove air pockets and settle the soil. Do not compact greater than 80 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method.
   3. Check placed soil for compaction with a penetrometer or densitometer or similar.
F. Compact the first lift of backfill material, previously spread, to 95 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method or in accordance with Project Specifications for hardscape areas, whichever is greater.
G. Add and compact additional backfill material so that the final finished elevation is at approximately the same level of the placed planting soil within the Silva Cells.
   1. Maintain the geogrid between the Silva Cell system and the backfill material at all times.
H. Place the second lift of backfill material loosely around the perimeter of the Silva Cell system, between the geogrid and the sides of the excavation so that the material is 2 to 3 inches below the top of the posts. Do not compact.
I. Place the second lift of planting soil inside of the Silva Cell to the bottom of the strongbacks. Walk through.
J. Remove strongbacks, place one 1x posts into each of the previously-installed 2x posts. Rotate clockwise to snap in place, forming a 3x post assembly.
K. Immediately reinstall strongbacks on top of the post assembly.
L. Repeat process of alternately placing backfill and planting soil so that elevation of the compacted backfill and the walked-through planting soil are just below the level of the strongbacks.

3.11 INSTALLATION OF IRRIGATION

A. Install irrigation in accordance with the Drawings and Specifications. Remove only the minimum number of strongbacks needed to accommodate the Work and reinstall them immediately upon completion to maintain alignment of posts.

3.12 INSTALLATION OF SILVA CELL DECK

A. Obtain final approval by the Engineer of planting soil installation prior to installation of the Silva Cell decks.
B. Remove strongbacks, level out the planting soil, and immediately install decks over the posts below. Place deck over the top of the posts. Push decks down until the deck clips lock into the posts, snapping the deck into place.
C. Fold the 12 inches (300 mm) of geogrid onto the top of the decks.

3.13 FINAL BACKFILL PLACEMENT AND COMPACTION

A. Place and compact final lift of backfill material to 95 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method, such that the backfill is flush with the top of the installed deck. Do not allow compacting equipment to come in contact with the decks.

3.14 INSTALLATION OF GEOTEXTILE AND AGGREGATE BASE COURSE OVER THE DECK

A. Place geotextile over the top of the deck and extend to the edge of the excavation. Overlap joints a minimum of 18 inches (450 mm). Leave enough slack in the geotextile for the aggregate base course to push the geotextile down in the gaps in between the decks.
B. Install the aggregate base course (including aggregate setting bed if installing unit pavers) over the geotextile immediately after completing the installation of the fabrics. Work the aggregate from one side of the layout to the other so that the fabric and aggregate conform to the Silva Cell deck contours.
C. Maintain equipment used to place aggregate base course completely outside the limits of the Silva Cell excavation area to prevent damage to the installed system.
D. For large or confined areas, where aggregate cannot easily be placed from the edges of the excavated area, obtain approval for the installation procedure and types of equipment to be used in the installation from the Silva Cell manufacturer.
E. Compact aggregate base course(s) to 95 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method. Utilize a vibration or plate compactor with a maximum weight of 800 lbs (362.87 kg).
F. Do not drive vehicles or operate equipment over the completed aggregate base course.

3.15 INSTALLATION OF CONCRETE CURBS AT TREE OPENINGS, AGGREGATE SUBBASE AND PAVEMENT ABOVE THE SILVA CELL SYSTEM

A. Place concrete curbs along planting areas and tree openings as shown on the Drawings to retain the aggregate base course from migrating into the planting soil.
B. When staking concrete forms (e.g. curbs around the tree openings), prevent stakes from penetrating the Silva Cell decks.
C. Turn down edge of concrete paving to the Silva Cell deck along the edges of tree openings or planting areas to retain the aggregate base course material.
D. When paving type is a unit paver or other flexible material, provide a concrete curb under the paving at the edge of the Silva Cell deck to retain the aggregate base course material at the tree opening.
E. Place paving material over Silva Cell system in accordance with the Drawings.
    1. The Silva Cell system does not fully meet loading strength until the final paving is installed. Do not operate construction equipment on top of the Silva Cell system until paving installation has been completed.

F. Use care when placing paving or other backfill on top of Silva Cell system to prevent damage to the Silva Cell system or its components.

3.16 INSTALLATION OF ROOT BARRIERS

A. Install root barrier in accordance with manufacturer's installation instructions.

3.17 INSTALLATION OF PLANTING SOIL WITHIN THE TREE PLANTING AREA

A. Remove rubble, debris, dust and silt from the top of the planting soil within the tree opening that may have accumulated after the initial installation of the planting soil within the Silva Cells.
B. Install additional planting soil within the tree openings, to the depths indicated on the Drawings.
   1. Use the same soil used within the Silva Cells for planting soil within the tree openings.

C. Compact planting soil under the tree root ball to between 85 and 90 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method, to prevent settlement of the root ball.
D. Place trees in accordance with the Drawings.

3.18 PROTECTION

A. Keep construction traffic away from the limits of the Silva Cells until the final pavement profile is in place. The Silva Cell system does not fully meet loading strength until the final paving is installed.
   1. Do not operate equipment directly on top of the Silva Cell system until paving installation has been completed.
   2. Provide fencing and other barriers to prevent vehicles from entering into the Silva Cell area.
B. When the Silva Cell installation is completed and the permanent pavement is in place, limit traffic and construction related activities to only loads less than the design loads.

3.19 CLEAN UP

A. Perform clean up during installation and upon completion of the Work. Maintain the site free of soil, sediment, trash and debris. Remove excess soil materials, debris, and equipment from the site following completion of the Work of this Section.
B. Repair damage to adjacent materials and surfaces resulting from installation of this Work using mechanics skilled in remedial work of the construction type and trades affected.

END OF SECTION

SECTION 32 94 56
PLANTING SOIL FOR SOIL CELLS (SILVA CELLS)

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Labor, materials, tools, supplies, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, and delivery of planting soil and /or the modification of existing site soil for use as planting soil within the Silva Cell system.

B. The scope of Work in this Section includes, but is not limited to, the following:
1. Locate, purchase, deliver and install imported planting soil and soil amendments.

C. Related Requirements:

1. Drawings and general provisions of Contract, including General and Supplementary Conditions and Specifications, apply to Work of this Section.

2. JSP-09 – Submittal Procedures: For administrative and procedural requirement for processing of submittals during the construction phase.

3. City of Springfield General Conditions and Technical Specifications for Public Improvements – Closeout Procedures: For administration and procedural requirements for completion of the Work.

4. Section 32 94 51 Silva Cells.

1.02 REFERENCES

A. Definitions:
1. COMPACTION: The density of soil measured as oven dry weight divided by volume.
2. EXISTING SOIL: Mineral soil existing at the locations of proposed planting of area designated for the installation of Silva Cells after the majority of the construction within and around the planting or Silva Cell site is completed and just prior to the start of Work to excavate the soil
3. ENGINEER: The person or entity, employed by the Owner to represent their interest in the review of the Work.
4. PED: Clump or clod of soil held together by a combination of clay, organic matter, and fungal hyphae, retaining the original structure of the harvested soil.
5. SCREENED SOIL: Soil that has been processed through a metal screen to remove or break apart soil peds (clumps /clods), roots, rocks and debris and remove larger physical items in the soil not permitted by the specification.
6. SILVA CELLS: Structural paving support system defined in Section 32 94 51 Silva Cells.
7. SUBGRADE: Surface or elevation of subsoil remaining after completing excavation, or top surface of fill or backfill, before placing planting soil.

B. Reference Standards:

1. ASTM International (ASTM)
   a. ASTM C33, Standard Specification for Concrete Aggregates- Fine Aggregates.

2. The Soil Science Society of America.
   a. Methods of Soil Analysis, most current edition,
3. United States Department of Agriculture, Natural Resources Conservation Service

a. National Soil Survey Handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054242

1.03 SUBMITTALS

A. Action Submittals: Submit these to the Engineer for review and acceptance not less than 45 days prior to start of installation of materials and products specified in this Section.

1. Product Data: For each type of product, submit manufacturer's product literature with technical data sufficient to demonstrate that the product meets these specifications.

2. Test and Evaluation Reports:
   a. Include analysis of bulk materials including soils and aggregates, by a recognized laboratory that demonstrates that the materials meet the Specification requirements.
   b. Submit required soil test analysis report for each sample of imported topsoil, existing site soil, and planting soil mixes from an approved soil-testing laboratory as follows:
      1) Do not submit planting soil mixes, for testing until all topsoil, compost, and coarse sand have been approved.
      2) If tests fail to meet the Specifications, obtain other sources of material, retest and resubmit until accepted by the Engineer.
      3) All testing shall be performed following the requirements of *Methods of Soil Analysis*, The Soil Science Society of America.
      4) Provide a particle size analysis (percent dry weight) and USDA soil texture analysis. Soil testing of planting soil mixes shall also include USDA gradation distribution of gravel, coarse sand, medium sand, and fine sand in addition to silt and clay. Reports of partical size distribution shall use USDA size nomenclature and analysis protocols.
      5) Provide the following other soil properties:
         a.) pH and buffer pH.
         b.) Percent organic content by oven dried weight.
         c.) Nutrient levels by parts per million including: phosphorus, potassium, magnesium, manganese, iron, zinc and calcium. Nutrient test shall include the testing laboratory recommendations for supplemental additions to the soil for optimum growth of the plantings specified.
         d.) Soluble salt by electrical conductivity of a 1:2 soil water sample measured in Milliohm per cm.
      6) All soil testing will be at the expense of the Contractor.

3. Samples:
   a. Each sample shall be double bagged packaged in two plastic zip loc style bags. Each bag shall be clearly marked with the project name, date, contractors name and telephone number, and product name.
   b. Samples of all existing site soil, topsoil, coarse sand and, compost and planting soil mixes shall be submitted at the same time as the particle size and physical analysis of that material.
   c. Samples of the existing site soil that are under existing pavement to be removed may be submitted as soon as possible after the paving is removed.
   d. Samples will be reviewed for appearance only.
   e. Provide samples for the following products.
      1) One-gallon (3.79-liter) sample of imported topsoil.

1.04 QUALITY ASSURANCE

A. Soil Testing Laboratory Qualifications: The testing laboratory shall specialize in agricultural soil testing and be a member of the Soil Science Society of America's, North American Proficiency Testing Program (NAPT). Testing results for soil particle size shall be reported using USDA sizes

for sand, silt, and clay.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Weather: Do not mix or deliver soil when frozen or muddy.
B. Protect soil and soil stockpiles, from wind, rain and washing that can erode soil or separate fines and coarse material, and contamination by chemicals, dust and debris that may be detrimental to plants or soil drainage. Confine delivered materials to neat piles in areas coordinated with the site supervisor. Cover stockpiles with plastic sheeting or fabric at the end of each Workday.
C. All manufactured packaged products and material shall be delivered to the site in unopened containers and stored in a dry enclosed space suitable for the material and meeting all environmental regulations.
    1. Biological and chemical additives shall be protected from extreme humidity, cold, or heat. All products shall be freshly manufactured and dated for the year in which the products are to be used. Chemical amendments shall have original labels intact and legible, stating the guaranteed chemical analysis.

PART 2 - PRODUCTS

2.01 IMPORTED TOPSOIL

A. Imported topsoil: Fertile, friable soil loam topsoil suitable for the germination of seeds and the support of vegetative growth meeting the following criteria:
    1. Soil texture: USDA loam, sandy clay loam or sandy loam with clay content between 15 and 35 percent; a combined clay/silt content of no more than 60 percent; and sand between 15 and 60 percent.

    2. Except where noted, imported topsoil shall NOT have been screened and shall retain soil peds (clumps/clods) larger than 2 inches (50 mm) in diameter throughout the stockpile after harvesting.
        a. Light screening through a 2-inch (50 mm) square or larger opening will be permissible in soils with clay content of 20 percent or greater if required to break up large peds (clumps/clods) or remove coarse roots and stones.
        b. Retained soil peds (clumps/clods) shall be the same color on the inside as is visible on the outside surface of the ped.

    3. Soil objects larger than 1/4 inch (6.24 mm) in diameter: Imported topsoil shall contain less than 8 percent by volume total of the above objects 1/4 inch to 1 inch (6.24 mm to 25 mm) in diameter. Remove all objects larger than 1 inch (25 mm) in its longest dimension.
        a. Meet the above requirement by utilizing acceptable soils sources rather than soil screening.

    4. Imported topsoil may be a harvested soil from fields or development sites or purchased from suppliers who collect and process soil. The organic content and particle size distribution shall be the result of natural soil formation. Manufactured soils where sand, composted organic material or other additives have been added to the soil to meet the requirements of imported topsoil shall not be acceptable.

    5. pH value shall be between 5.5 and 7.5.

    6. Percent Organic Matter (OM): greater than 1 percent, by dry weight.

    7. Soluble Salt Level: Less than 3 mmho/cm.

8. Soil nutrient chemistry suitable for growing the plants specified or after modification.

9. Germinating seedlings from seeds in the soil shall be removed within one month of germination whether during the period the soil is being stored or after installation, including during the warranty period of the plants.

B. Submittal Requirements: Provide a one-gallon (3.79-liter) sample from each imported topsoil source with required soil testing results. The sample shall be a mixture of the random samples taken around the source stockpile or field. The soil sample shall be delivered with soil peds (clumps/clods) intact that represent the size and quantity of expected peds (clumps/clods) in the final delivered soil. The sample shall represent the expected amount of objects larger than 1/4 inch (6.24 mm).

2.02 FERTILIZER

A. If noted by the soil test recommendations, add slow-release, organic fertilizer based on soil test and plant requirements.
B. Submittal Requirements: Provide manufacturer's literature that the product meets the requirements.

PART 3 - EXECUTION

3.01 INSTALLATION OF PLANTING SOIL IN SILVA CELLS

A. Refer to Section 32 94 51 - Silva Cells.

END OF SECTION

Submittal Checklist for Reference Only

Provide submittals required to the Engineer for review and approval. The Submittal process may take up to 2 months prior to installation of the Silva Cell system and should be executed as soon as possible after the Contract is awarded. Testing will be at the expense of the Contractor.

SOIL COMPONENT SUBMITTALS – SUBMITTED PRIOR TO SOIL DELIVERY TO SITE

IMPORTED TOPSOIL
- Lab analysis for physical and chemical composition
- One-gallon (3.79-liter) sample

FERTILIZER
- Manufacturer's literature

AGENDA

1) Sign-Up Sheet – Pass around for registering attendees.

2) Contacts
   a) Owner Contact(s):

      Jonathan Peitz, EIT – Project Engineer, City of Springfield; Phone: (417) 864-1994, Fax: (417) 864-1907

      Paula Brookshire, P.E. – Transportation Engineering, City of Springfield; Phone: (417) 864-1989, Fax: (417) 864-1907

   b) Consultant Contact(s):

      Reid Catt, P.E. – Olsson Associates; Phone (913) 381-1170

3) Project Schedules

a)	Bids Due:	10:30 a.m., January 22, 2016 840 Boonville (**Room 285** – Busch Building)
b)	Bid Opening:	10:30 a.m. January 22, 2016 840 Boonville (**Room 285** – Busch Building)
c)	Anticipated Notice to Proceed:	February 2016
d)	Time Allotted for Project:	May 3, 2016
e)	Liquidated Damages:	$1,000/day

4) Bidding and Contract Requirements
   a) All bidders must be listed on MoDOT's Qualified Contractor List. The contractor questionnaire must be on file 7 days prior to the bid opening.
   b) The Contractor shall seal their bid in an envelope and clearly mark the outside with the name of the Project and company name/letterhead.
   c) Required with each bid:
      i) Bid Form
      ii) Bid Bond (5%)
      iii) Subcontractors List & Disclosure Forms
      iv) Anti-Collusion Statement
      v) Statement of Bidders Qualifications, and/or identification of LLC participants.
      vi) Acknowledgement of Addendums
      vii) Subcontractors Certification Regarding Affirmative Action
      viii) DBE Submittal Form
      ix) E-Verify Affidavit & MOU
   d) Review of Unit Prices – Include in the Bid Price the quantity shown at the unit price bid. These are allowance quantities are IN ADDITION TO any quantities indicated elsewhere in the documents as included in the base bid, which are subject to modification by Change Order.
   e) Date for last addendum to be issued will be Friday, January 15th. All questions should be asked in writing, and submitted before 5:00 p.m. Thursday, January 14th.
   f) Project is exempt from Sales Tax
      i) Tax exemption certificate will be furnished to the General Contractor.

ii) It is the General Contractor's responsibility to ensure that copies of the certificate are provided to other necessary parties, as outlined in RSMo 144.062.3

g) Prevailing Wages and/or Davis Bacon
   i) Prevailing Wage – Wage Order 22

h) Weather Delays.
   i) In general, there will be no extension of Contract time due to weather.

i) Review what is needed at the time contracts is signed, such as Payment Bond (100% of base bid) and a Labor & Materials Bond (100% of base bid), Insurance with endorsements, OSHA 10-hr.
   i) Insurance – NO OCP REQUIRED

5) Project Description – This project consists of the construction of 1120 square yards of 4" concrete sidewalk, 310 square yards of 8" tinted concrete, replacement of 660 linear feet of concrete curb & gutter, 2000 square yards of full depth pavement, 630 square yards of 8" concrete driveway, 520 linear feet of storm pipe, various storm structures, pedestrian lighting and electrical conduit.

6) Special Provisions
   a) Use of Site
      i) Maximum area to be occupied by contractor shall be within street right-of-way
      ii) Maximum daytime area to be occupied by contractor – maintain access to properties
   b) Street/lane/sidewalk closures
      i) Anticipated.
         (1) Sidewalk closure is anticipated and contractor shall have adequate traffic control devices in place to reroute pedestrians to other sidewalks.
         (2) Road Closure will be allowed for this project. Please review JSP-105
   c) Submittals and Samples
      i) Any submittals shall be provided and approved prior to start of construction; please refer to JSP-09.
   d) Temporary erosion control and sediment Control.
      i) Follow erosion and sediment control phasing plan provided on Sheet 22.
      ii) Trees on the east side of Main at the intersection of College shall be protected throughout construction.
   e) Progress Schedule
      i) Schedule will be required prior to start of project. Please refer to JSP-04
         (a) Anticipated NTP: February
         (b) Finish Date: **May 3, 2016**
   f) Utility Discussion
      i) Multiple utilities in the area. Use extreme caution when excavating.
      ii) CU Electric Discussion – CU Electric plan for streetlight foundations, conduit and wires has been included with plan set.
      iii) JSP-116 Utilities Section 5 goes into more detail regarding lowering by AT&T, Century Link and CU Gas & Water.
   g) Clarifications
      (1) Bid Opening will be in Room 285 at 10:30 am January 22nd.
      (2) Bid Alternates
         (a) Asphalt
         (b) Concrete shall be 7" concrete with 12" joint spacing and contractor shall provide jointing plan.
      (3) Bid Form – I have updated E2 and E3 for Addendum 1.

(4) Silva Cell installation and Soils will be included in Addendum 1.

h) Maintain project site – in a neat, clean, and organized manner. Premises shall be cleaned on a daily basis. Workmen shall be courteous and polite at all times. Obscene language, gestures, etc. will not be tolerated.

i) Construction Staking – Provided by City. Please refer to JSP-05

j) PROWAG Requirements – Please refer to JSP-10

7) Questions

Notes:

MAIN AVENUE STREETSCAPE
PHASE 1

PRE-BID MEETING
January 6, 2016

CITY OF Springfield PUBLIC WORKS

2014PW0057T **TAP-5901 (805)**

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