



# CITY OF SPRINGFIELD

## Special Provisions

for

### P21108

## City Hall Plaza Renovation

## Engineering Concurrence

The Managing Engineer for the City of Springfield concurs with the preparation of the plans and specifications, and further concurs with advertising this project for quotes.

  
Jeffrey A. Paschall, P.E.

5/28/15  
Date

Solicitation No. 1321

**SPECIAL PROVISIONS  
REGARDING CONTRACTS NOT TO EXCEED \$100,000**

References to number of Divisions, Section, Sub-Section and the like shall mean the 1994 Edition of the Standard Construction Specifications, including all Addenda, Standard Drawings, and other Contractual Documents of the City of Springfield, Lane County, Oregon.

These Special Provisions supplement and amplify certain sections of the City of Springfield, Oregon, [Standard Construction Specifications](#). The Standard Construction Specifications shall apply except as modified herein. These Special Provisions and additional technical specifications may contain occasional requirements not pertinent to the project. However, these specifications shall apply in all particulars insofar as they are applicable to this project.

**SECTION A – General Requirements**

**P21108 – City Hall Plaza Renovation**

**A1.1 Applicable Standard Specifications**

The 1994 Edition of the Standard Construction Specifications of the City of Springfield, Oregon, Standard Construction Specifications (including all revisions at date of Quote submittal), shall apply to this quote submittal and construction contract except as may be modified herein. In the case of discrepancy, unless noted otherwise herein, the more restrictive provisions shall apply.

PLEASE NOTE: FOR ALL REQUEST FOR COMPETITIVE PRICE QUOTE PUBLIC IMPROVEMENT CONTRACTS NOT TO EXCEED \$100,000 THE DESCRIPTION SUBSTITUTIONS INDICATED BELOW SHOULD BE USED:

- a) **Bid** should be replaced with **Quote**
- b) **Bidder** should be replaced with **Prospective Contractor**
- c) **Bid Proposal** should be replaced with **Quote Submittal**
- d) **Department of Public Works** should be replaced with **Development and Public Works Department**
- e) **Instruction to Bidders** should be replaced with **Instruction to Prospective Contractor**
- f) **Invitation to Bid** should be replaced with **Request for Competitive Price Quote**
- g) **Proposal** should be replaced with **Quote**
- h) **Proposal Package** should be replaced with **Request for Competitive Quote Package**

**A1.2 Form of Proposal**

**REPLACE SECTION 102.02 “FORM OF PROPOSAL” OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

“The Proposal and the proposal guarantee in the form of a bid bond, certified check, or cashier’s check, shall be enclosed in a sealed, labeled and addressed envelope, as required in the Instructions to Bidders and filed as required therein. The outside of the envelope shall plainly identify: (1) The project name and (2) The bid opening date.

All Proposals must be clearly and distinctly typed or written with ink or indelible pencil.

All Proposals shall be on the form furnished by Owner, and in addition to necessary unit price items and total prices in the column of totals to make a complete Bid, all applicable blanks giving

general information must be filled in and the Bids signed by an officer or duly authorized representative of the Bidder. Any statement accompanying and tending to qualify a Bid may cause rejection of such Bid, unless such statement is required, in a Proposal embracing alternate Bids. All bid documents except plans must be returned with the Bid.

Unless otherwise specified, Bidders shall bid on all Bid items included in the Proposal, and the low Bidder shall be determined as noted in Subsection 103.01 AWARD OF CONTRACT. Except as provided herein Proposals which are incomplete or fail to comply to all items required in the Proposal may be rejected."

**INSERT IN ITS PLACE THE FOLLOWING:**

"For your quote to be considered responsive by the City of Springfield the following documents must be included with your submission. A complete submittal package will consist of the following documents:

- ✓ Quote Submittal
- ✓ Financial Responsibility Form
- ✓ Minority, Women and Emerging Small Business/Disadvantaged Business Enterprise Form (MWESB)

All quotes shall be on the forms furnished by the City. All applicable blanks giving general information must be filled in and the quote signed by an officer or duly authorized representative of the Contractor. The only exceptions to this requirement are the MWESB and Contract documents. Completion of the MWESB form is voluntary, however it must be submitted with your Quote whether you complete the information or not. If you are awarded the Contract, you will be required to submit a fully executed copy of the Contract upon request. Any statement accompanying and tending to qualify a quote may cause rejection of such quote, unless such statement is required in a quote embracing alternate quotes.

Competitive Price Quotes should be clearly labeled with the project number, project title and the statement *Request for Competitive Price Quote* and submitted to the person and in the manner specified in the Request for Competitive Price Quote document.

All quotes must be clearly and distinctly typed or written with ink or indelible pencil. If, in the opinion of the City, the prices in any quote appear to be unbalanced, incomplete, or fail to comply with all the terms required, the quote may be rejected."

**A1.3 Proposal Guaranty and Organization**

**REPLACE SECTION 102.05 "PROPOSAL GUARANTY AND ORGANIZATION" OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

"Each Bid must be accompanied by a Bid Bond, cash or a certified or cashier's check upon a bank in good standing, payable to the Finance Director of the City of Springfield, Oregon, in an amount equal to at least 10% of the total amount of the bid. Such Proposal guaranty shall be forfeited and become the property of the City in case the Bidder shall fail or neglect to furnish a satisfactory Performance Bond and Payment Bond and to execute the Contract within 10 days (Saturday, Sunday and holidays excepted) after receiving said Contract from the City for execution. Bid bonds submitted shall be on the form provided by the City in the Bid document."

**INSERT IN ITS PLACE THE FOLLOWING:**

"A Bid Bond will not be required with this Contract."

#### **A1.4 Addenda to Contract Documents**

##### **REPLACE SECTION 102.08 "ADDENDA TO CONTRACT DOCUMENTS" OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

"Any addenda issued by the Owner, which may include changes, corrections, additions, interpretations, or information, and issued 48 hours or more before the scheduled closing time for filing the Bids, Saturday, Sunday and legal holidays not included, shall be binding upon the Bidder. Owner shall supply copies of such addenda to all Contractors who have obtained copies of the Contract Documents for the purposes of bidding thereon. Failure of the Contractor to receive or obtain such addenda shall not excuse him from compliance therewith, if he is awarded the Contract."

##### **INSERT IN ITS PLACE THE FOLLOWING:**

"Any addenda issued by the City, which may include changes, corrections, additions, interpretations, or information issued 72 hours or more before the scheduled closing time for submitting the quotes shall have the same binding effect as though contained in the main body of the Request for Competitive Price Quote documents. Addenda will be posted to the City's website at <http://www.springfield-or.gov/dpw/CompetitiveQuotes.htm>. The Contractor should check the website frequently for new postings during the open quote period. The City shall make a reasonable effort to notify all individuals, firms, and corporations that were included in the initial solicitation and those individuals that attended a Pre-Quote Informational meeting and provided contact information on the sign-in sheet when addenda are issued. Failure of the Contractor to receive or obtain such addenda shall not excuse them from compliance, if they are awarded the Contract."

#### **A1.5 Award of Contract**

##### **REPLACE THE 1<sup>ST</sup> PARAGRAPH OF SECTION 103.01 "AWARD OF CONTRACT" OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

"The award will be made by Owner to the Bidder submitting the lowest acceptable Bid. In determining the lowest acceptable Bid, Owner may take into account, among other factors, the prices bid, discounts if any, time of completion and delivery proposed, as between equal Bids, the relative merits and performance of any items specifically proposed by the Bidder, any variation in maintenance and guarantee periods specifically proposed by the Bidder in excess of any minimum specified, the realistic balance of prices in the Proposals for various parts or units of work, and the experience and ability of Bidder to perform the work."

##### **INSERT IN ITS PLACE THE FOLLOWING:**

"The Contract will be awarded to the responsible Contractor who submits the lowest responsive quote. The City reserves the right to reject any or all bids not in compliance with all prescribed public bidding procedures and requirements, including the requirement to demonstrate the bidder's responsibility under ORS 279C.375, or waive minor irregularities not affecting substantial rights and may reject for good cause any or all bids upon a finding of the City of Springfield it is in the public interest to do so and accept such bids that in the opinion of the Springfield City Council are in the best interest of the City."

#### **A1.6 Insurance**

##### **REPLACE SECTION 107.06 "INSURANCE" OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

The Contractor shall provide and maintain general liability, auto liability, property, and workers' compensation insurance for life of this Contract.

General Liability Insurance

The Contractor shall maintain an ISO Commercial General Liability insurance policy (or an equivalent policy approved by Owner) with combined single limits of at least \$1,000,000 per occurrence for bodily injury, personal injury, and property damage and an aggregate limit of at least \$2,000,000. The policy shall include coverage for contractual liabilities.

Comprehensive Automobile Liability Insurance

The Contractor shall maintain an automobile liability insurance policy with combined single limits of at least \$1,000,000 per occurrence for bodily injury, personal injury, and property damage.

Additional Insured Endorsement

The general and automobile insurance policies specified above shall include endorsements naming as an additional insured "the City of Springfield, its agents, employees and officials all while acting within their official capacity as such."

Property Insurance

Depending on the nature of the construction contemplated under this contract, Owner may require Contractor to provide property insurance. Refer to Special Provisions section of this Contract.

Workers' Compensation Insurance

Contractor, its subcontractors, if any, and all employers working under this agreement are subject employers under the Oregon Workers' Compensation Law and shall comply with ORS 656.017, which requires them to provide workers' compensation coverage for all their subject workers.

Contractor is responsible for maintaining workers' compensation insurance for his employees and assuring that his subcontractors, if any, also maintain workers' compensation insurance. Contractor shall defend, indemnify, and hold Owner harmless from any liability for any workers' compensation claims costs, fines, or costs whatsoever arising from Contractor's or his subcontractors' failure to comply with ORS 656.017.

Additional Policies and Special Coverages

Refer to the Special Provisions section of this Contract for additional coverages that may be required.

Certificates of Insurance

Certificates of insurance evidencing all policies required by this Contract shall be delivered to the Owner prior to the commencement of any work. All certificates shall include a 30-day notice of cancellation clause and required additional insured endorsements. The Owner has the right to reject any certificate for unacceptable coverage and/or companies.

**INSERT IN ITS PLACE THE FOLLOWING:**

"INSURANCE

All insurance shall be approved by the City as to terms, conditions and form prior to beginning work.

Public Liability and Property Damage

The Contractor shall maintain in force for the duration of this Contract a Commercial General Liability insurance policy written on an occurrence basis with limits not less than \$2,000,000 per

occurrence and \$3,000,000 in the aggregate. The policy will be endorsed with a "per project" aggregate endorsement. Automobile Liability (owned, non-owned, and hired) insurance with limits not less than \$1,000,000 per occurrence shall be maintained. The City, its employees, officials and agents will be named as Additional Insured's where operations are being conducted related to this Contract on the General and Automobile Liability policies as respects to work or services performed under this agreement to the extent that the death or bodily injury to persons or damage to property arises out of the fault of the Contractor or the fault of the Contractor's agents, representatives or subcontractors. The following statement will appear on the face of the certificate; "The City, its employees, officials and agents are all named as additional insured while acting in their capacity as such." The City's additional insured status for Products and Completed Operations hazards shall extend for at least one year beyond the acceptance of the project. This insurance shall be primary and shall be paid and applied first in its entirety prior to any application of insurance the City may carry on its own.

#### Workers' Compensation

The Contractor shall provide and maintain Workers' Compensation coverage with limits no less than \$500,000 for its employees, officers, agents, or partners, as required by applicable Workers' Compensation laws. If the Contractor is exempt from this coverage a written statement, signed by the Contractor, explaining the reason for the exemption will be provided to the City prior to commencement of any work.

#### Course of Construction and/or Installation Floater

The Contractor shall maintain in full force for the duration of this contract an All Risk insurance policy approved by the City as to terms, conditions and form covering the replacement cost of the work during the course of construction. The policy shall include the interests of the City and Architect/Engineer, as applicable, and the first two layers of Subcontractors. The amount of insurance shall equal the completed value of the Contract. The City, at its option, may elect to supply this coverage.

#### Asbestos Abatement (only applicable to Asbestos Specific Contracts)

If applicable to this Contract, the Contractor shall maintain in full force a Commercial General Liability policy approved by the City as to terms, conditions and form that is Asbestos Specific with a minimum limit of \$2,000,000 per occurrence and \$3,000,000 in the aggregate written on a form that meets the following criteria as follows:

- a. A full occurrence form, or
- b. A limited occurrence form with at least a three-year (3) tail, or
- c. A claims made form with a three-year (3) tail.

#### Pollution Liability Coverage (only applicable to Pollution Specific Contracts)

If applicable to this Contract, the Contractor shall maintain in full force a Commercial General Liability policy approved by the City as to terms, conditions and form that is Pollution Specific with a minimum limit of \$2,000,000 per occurrence and \$3,000,000 in the aggregate written on a form that meets the following criteria as follows:

- a. A full occurrence form, or
- b. A limited occurrence form with at least a three-year (3) tail, or
- c. A claims made form with a three-year (3) tail.

Professional Liability Coverage (only applicable to Contracts if specified)

If Professional Liability insurance is required, the City must approve the terms, conditions and limits prior to commencement of any work.

Additional Policies and Special Coverages

Refer to the Special Provisions section of this Contract for additional coverages that may be required.

Railroad Protective Liability Coverage

If work being performed under this Contract is near railroad tracks or a railroad right of way and the Railroad requires special insurance (for example: Railroad Protective Liability Coverage) Contractor will be responsible for meeting the Railroad insurance requirements before any work commences. Any insurance required to be purchased by the Railroad is in addition to the insurance required by the City.

Subcontractors

The Contractor shall require all Subcontractors to provide and maintain General Liability, Auto Liability and Workers' Compensation insurance and, as applicable, Professional, Asbestos and Pollution Liability with coverage's equivalent to those required of the General Contractor in this Contract. The Contractor shall require certificates of insurance from all Subcontractors as evidence of coverage.

Additional Insured Endorsement

All certificates of insurance, with the exception of Professional Liability and Railroad Protective Liability, must include an endorsement which lists the City of Springfield as a named additional insured. The following statement will appear on the face of the certificate; "The City, its employees, officials and agents are all named as additional insured while acting in their capacity as such."

Evidence of Coverage and Notice of Cancellation or Material Change in Coverage

Evidence of the required coverages issued by a company satisfactory of the City shall be provided to the City by way of a certificate of insurance before any work or services commence. A 30-day notice of cancellation or material change in coverage clause shall be included.

If the approved insurance company will not provide this 30 day notice, it shall be the responsibility of the Contractor to provide written notice to the City within two (2) days of the Contractor becoming aware that their coverage has been cancelled or materially changed. The Contractor shall e-mail notification directly to Bob Duey, Finance Director at rduey@springfield-or.gov . Regardless of the circumstances causing the Contractor's insurance coverage to cease or be modified, it is the Contractor's responsibility to notify the City as described above.

Failure to maintain the proper insurance or provide notice of cancellation or material change shall, at the City's option, be grounds for immediate termination of this Contract.

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*(Contractor initials)*

Equipment and Material

The Contractor shall be responsible for any loss, damage, or destruction of its own property, equipment, and materials used in conjunction with the work."

## **A1.7 Submission of Certified Payroll**

### **REPLACE THE 2<sup>ND</sup> PARAGRAPH OF SECTION 109.07 OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

Once before the first payment and each time the prevailing wage rates change, and once before final payment is made, Contractor shall supply and file with Owner a statement in writing under oath, in form prescribed by the State Labor Commission and which conforms with ORS Chapter 279, certifying the hourly rate of wages paid each classification of workman not exempt by statute who is employed upon such project and further certifying that no workman employed has been paid less than minimum prevailing wage rate. Each Subcontractor who performed work on the project during the period covered by the payment may be required to file with Owner a similar statement which covers its workmen.

### **INSERT IN ITS PLACE THE FOLLOWING:**

It shall be the responsibility of the Contractor and any subcontractors to submit certified payroll statements to the City as to the wage rates paid to each worker as follows:

As specified in ORS 279C.845, the Contractor or the Contractor's surety and every Subcontractor or the Subcontractor's surety shall file certified statements with the public agency in writing, on a form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker whom the Contractor or the Subcontractor has employed upon the public works, and further certifying that no worker employed upon the public works has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract. The certificate and certified statement shall be verified by the oath of the Contractor or the Contractor's surety or Subcontractor or the Subcontractor's surety that the Contractor or Subcontractor has read the certified statement and certificate and knows the contents thereof and that the same is true to the Contractor or Subcontractor's knowledge. Certified statements (also referred to as certified payroll reports) shall be submitted to the City no later than the 5<sup>th</sup> day of the following month for which the certified statement and certificate are being presented, regardless of whether any actual work is performed on the project or not. This information must be submitted to the City and also retained by the Contractor and Subcontractor(s) for three years.

Contracting agencies and general contractors are required to withhold 25% of amounts to Contractors if certified payrolls are not filed by the Contractor as required for work performed on projects subject to the prevailing wage rate law. Failure of Contractors to comply with the certified payroll filing requirements of the law, therefore, will result in a negative fiscal impact to those Contractors of up to 25% of their amount owed.

Each worker employed in the performance of this contract, either by the Contractor or Subcontractor or other person doing or contracting to do or contracting for the whole or any part of the work of the contract, must be paid not less than the specified minimum hourly rate of wage in accordance with ORS 279C.838 and 279C.840.

Requirements related to the submission of certified payroll reports can be found in Attachment 2.

## **A1.8 Progress Payment**

### **REPLACE THE 6<sup>TH</sup> PARAGRAPH OF SECTION 109.07 OF THE STANDARD CONSTRUCTION SPECIFICATIONS:**

Progress payment will be made by the Owner on a monthly basis no later than the 20<sup>th</sup> day of the subsequent month of work performed, except that, additional days may be required when a

payment is accompanied by one or more of the following: an extension of completion time, change order or extra bill. Payment may be made via use of checks or warrants at the option of the Owner for the amount of the approved estimate, less retainage.

**INSERT IN ITS PLACE THE FOLLOWING:**

“Progress payment will be made by the City on a monthly basis in the month subsequent to the work being performed, except that additional days may be required when the Contractor fails to submit complete and accurate certified payroll reports which are in compliance with ORS279C.845 when due, or a payment is accompanied by one or more of the following: an extension of completion time, change order or bill. If the Contractor fails to submit acceptable certified payroll reports when due, or one or more of the previously stated exceptions apply, the progress payment may be made up to fourteen (14) days after the date the certified payroll or other required information in question is received by the City.

The scheduled release of payment will depend upon the method of payment selected by the Contractor. If the Contractor elects to receive payment by check, payment will be released no later than the 20<sup>th</sup> day of the month. If the Contractor elects to receive payment by electronic Automated Clearing House (ACH) transfer, the funds will be transferred no later than the fourth Friday of the month. City will endeavor to honor Contractor’s election to receive payment by ACH transfer, however, City reserves the right to make payment via use of check at the sole discretion of the City.”

**A1.9 Oregon Products**

Contractor’s attention is directed to the provisions of Oregon Law, ORS 279A.120 regarding the preference for products that have been manufactured or produced in Oregon. Contractor shall use Oregon-produced or manufactured materials with respect to common building materials such as cement, sand, crushed rock, gravel, plaster, etc., and Oregon-manufactured products in all cases where price, fitness, availability and quality are otherwise equal.

**A1.10 Salvage and Debris**

Unless otherwise indicated on the drawings or in the specifications, all castings, pipe, equipment, demolition debris, fences, trees, shrubs, spoil or any other discarded material or equipment shall become the property of the Contractor and shall be salvaged or disposed of in a manner compliant with applicable Federal, State and local laws and regulations governing disposal of such waste products. No burning of debris or any other discarded material will be permitted. The Contractor shall perform any demolition for the completion of this project and shall salvage and recycle all construction and demolition debris as is feasible and cost effective, in accordance with ORS 279C.510.

**A1.11 Brand Name or Equal Specification**

Brand Name or Equal Specification means a specification that uses one or more manufacturers’ names, makes, catalog numbers or similar identifying characteristics to describe the standard of quality, performance, functionality or other characteristics needed to meet the contracting agency’s requirements. The “Equal” product, component or process shall be the same or better than that named in function, performance, reliability, quality and general configuration. Determination of equal in reference to the project design requirements will be made by the Engineer, pursuant to Subsection 106.07. Unless otherwise specified, whenever a manufacturer’s name brand or model is mentioned, it is to be understood that the phrase “approved equal” is assumed to follow thereafter, whether it does in fact or not. Such specification authorizes Contractors to offer goods or services that are equivalent or superior to those brands named or described in the specification.

END OF SECTION

**SPECIAL PROVISIONS  
REGARDING CONTRACTS NOT TO EXCEED \$100,000**

**SECTION B – Scope of Work**

**P21108 - City Hall Plaza Renovation**

**B 1. GENERAL**

**B 1.1. Project Description**

The work to be performed under these specifications and drawings consists of the following:

This project is for the removal of the existing City Hall Plaza paving and landscaping and reconstruction of the Plaza as shown in the attached plans and specifications. Contractor shall protect and reuse as much of the existing gravel base as possible and install the new improvements to match all surrounding grades. Contractor shall supply all preparation, installation, supplies, equipment, materials and cleanup necessary to provide complete project.

**B 1.2 Applicable Codes and Standards**

- 1) All work shall be performed in accordance with the highest standard of practice in the industry and shall be furnished in conformance with all applicable codes, statutes or standards that apply to this work including, but not limited to, any applicable Federal, State or City of Springfield Codes, Standards and Ordinances including, but not limited to:
  - a) 2014 Oregon Structural Specialty code or current edition thereof.
  - b) Any applicable Federal, State, or City of Springfield Codes, Standards and Ordinances, including these contract documents. The 1994 Edition of the Standard Construction Specifications of the City of Springfield, Oregon, (including all revisions at date of Quote submittal), shall apply to this quote submittal and construction contract except as may be modified herein. In the case of discrepancy, unless noted otherwise herein, the more restrictive provisions shall apply.
  - c) Any items of work required by the above codes and standards but not specifically shown or mentioned shall be provided without additional cost.
  - d) Contractor is responsible for acquiring and paying for all permits, as well as, scheduling and passing any necessary inspections.

**B 1.3. Project Information**

- 1) General
  - a) Site Access and Care:
    - i. The Contractor shall be given such access to the site as necessary to complete the project. City will also allow the Contractor to stage at certain project sites out of the way of pedestrian and vehicle traffic. Final staging locations must be approved by the Project Manager. Contractor shall protect existing features that stay during project, and will be responsible for any damage caused by project. Contractor shall repair any damage at his sole expense.
  - b) Contractor shall make necessary arrangements to protect the public in the project area. Such

precautions may include, but are not limited to traffic control, cleanup, locking up of equipment and materials, fencing storage and construction areas or installing barricades for pedestrians or traffic. Also, any and all traffic closures or interruptions shall be coordinated and approved through the City's Traffic Engineer. Section Work shall be accomplished as described in these specifications and on the attached plans, taking all necessary precautions as required by law or best practice.

- c) Unless otherwise directed by the Project Manager, normal right-of-way (ROW) construction work zones with active project operations are to be conducted between the hours of **8:15 am to 4:15 pm daily**. Work outside of the ROW may extend beyond these hours but must comply with the City's noise ordinance. Any deviation of these work zone hours must be approved by the Project Manager prior to construction.
- d) Contractor shall take reasonable steps to provide public access to the building during construction. The Contractor shall provide adequate traffic control and signs to clarify the alternate or existing access available to City Hall. Measurement and payment of traffic control devices for temporary business access shall be cost incidental to Temporary Traffic Control.
- e) Utility Outages and Shutdowns:
  - i. Limit disruption of utility services to hours the building is unoccupied
  - ii. Do not disrupt or shut down life safety systems
  - iii. Prevent disruption of utility services to other facilities
- f) The Contractor shall review the information provided by the City and visit the site to verify conditions and make calculations and determinations of how to best provide the required service. Base estimates on amount and types of areas to be worked.
- g) The Contractor shall determine tools and equipment necessary for execution of the project. The Contractor shall determine the materials and labor necessary to furnish adequate protection for surfaces and objects inside and outside the work area and for adjoining work that could be damaged by preparation and/or work activities. Care shall be taken not to damage any surrounding work. Any damage shall be repaired at the Contractor's sole expense.
- h) All work performed shall carry a minimum 1-year warranty on materials and workmanship from date of formal acceptance by City of Springfield.
- i) Contractor is responsible for leaving the site in a neat and workman-like appearance during and after the project. This will include cleanup and safe and sanitary disposal of all debris generated during completion of the project (material containers, waste and trash, etc.) Contractor shall take all standard professional precautions to avoid contamination of the environment as required by law and to protect the public from operations. Contractor shall prepare and submit for approval a plan for containment that outlines how Contractor will keep contaminants, waste and debris out of the City's Stormwater system. This shall include such items as barriers, catch basin liners, dams, vacuuming, etc. to keep debris and contaminants out of the stormwater system.
- j) Work on Saturdays and/or Sundays may be required to avoid crowd conflicts between Contractors and business patrons/staff. Contractors shall work with the City to adjust the schedule to accommodate the work and special events or activities being held while the work is being completed. Saturday and Sunday work shall be noted on construction schedule to be submitted prior to start of work.
- k) Control of Installation:
  - i. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

- ii. Comply with manufacturers' instructions, including each step in sequence.
  - iii. Should manufacturers' instructions conflict with Contract Documents, request clarification from Project Manager prior to proceeding.
  - iv. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
  - v. Have Work performed by persons qualified to produce required and specified quality.
  - vi. Verify that field measurements are as indicated on these drawings or as instructed by the manufacturer.
- I) Work to be Completed Under Separate Contract and Not Included in This Contract.

The Owner will perform or award separate contracts for the following:

- i. Exterior Signage including ADA required signage.
- ii. Site Furnishings
- iii. Stair Repair and Coating
- iv. Landscape Plantings

#### **B.1.4 Mobilization**

- 1) Comply with the most recent version of the City of Springfield, Oregon Standard Construction Specifications.

#### **B 1.5 Clearing and Grubbing**

- 1) Comply with the most recent version of the City of Springfield, Oregon Standard Construction Specifications.
- 2) Contractor shall take care to protect form damage items that are to remain or materials in adjacent areas. Prior to commencement of work Contractor shall complete a site walk through noting and documenting with photos existing flaws or damage to infrastructure which is designated to remain. Contractor shall review with Project Manager any noted issues or items prior to commencement of work.

#### **B 1.6 Demolition**

- 1) Remove paving as shown in the drawings. Remove all concrete slabs on grade between the City Hall stairs and existing curbing on A and 5th Streets. Saw cut as necessary to avoid damage to surroundings and to create workable size pieces.
- 2) Maintain as much of the existing base and sub base material as possible for reuse under the new slabs. Only disturb base material as necessary to complete the work.
- 3) Do not remove manholes and manhole covers; curb inlets and catch basins, water meters, backflow valves or lighting fixtures. These items shall remain and new work shall match their existing grades, or Contractor shall adjust elevations as necessary to assure smooth transitions with new paving. Avoid ponding or damming water at these locations.
- 4) Remove other items indicated, for salvage and relocation.

- 5) Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
  - a) Obtain required permits.
  - b) Take precautions to prevent catastrophic or uncontrolled collapse of work to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
  - c) Provide, erect, and maintain temporary barriers and security devices.
  - d) Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
  - e) Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  - f) Do not close or obstruct roadways or sidewalks without appropriate approved permits.
  - g) Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
- 6) Do not begin demolition and removal until built elements to be salvaged or relocated have been removed.
- 7) Protect existing structures and other elements that are not to be removed.
  - a) Provide bracing and shoring as required to complete work.
  - b) Prevent movement or settlement of adjacent structures.
  - c) Stop work immediately if adjacent structures appear to be in danger.
- 8) If hazardous materials are discovered during removal operations, stop work and notify Project Manager and Owner; hazardous materials include, but are not limited to, regulated asbestos containing materials, lead, PCB's, and mercury.
- 9) Perform demolition in a manner that maximizes salvage and recycling of materials.
  - a) Dismantle existing construction and separate materials.
  - b) Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

### **B 1.7 Existing Utilities**

- 1) Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- 2) Protect existing utilities to remain from damage.
- 3) Do not disrupt public utilities without permit from authority having jurisdiction.
- 4) Do not close, shut off, or disrupt existing life safety systems that are in use without at least 3 days prior written notification to Project Manager and Owner.
- 5) Do not close, shut off, or disrupt existing utility branches, service lines or take-offs that are in use without at least 3 days prior written notification to Owner.
- 6) Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of

utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

- 7) Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

### **B 1.8 Debris and Waste Removal**

- 1) Remove debris, junk, and trash from site.
- 2) Leave site in clean condition, ready for subsequent work.
- 3) Clean up spillage and wind-blown debris from project site and surrounding public and private lands.

### **B 1.9 Laying Out the Work**

- 1) Verify locations of survey control points prior to starting work.
- 2) Promptly notify Project Manager of any discrepancies discovered.
- 3) Contractor shall locate and protect survey control and reference points prior to starting site work; preserve permanent reference points during construction.
- 4) Control datum for survey is that indicated on Drawings.
- 5) Promptly report to Project Manager the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- 6) Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Project Manager.
- 7) Utilize recognized engineering survey practices.
- 8) Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- 9) Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  - a) Periodically verify layouts by same means.
- 10) Tolerances
  - a) Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
  - b) Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Project Manager before proceeding.
  - c) Adjust products to appropriate dimensions; position before securing products in place.
  - d) All tolerances must comply with the American with Disabilities Act Standards for Accessible Design.

## **B 2. PRODUCTS**

### **B 2.1 Existing Products**

- 1) Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- 2) Unforeseen historic items encountered remain the property of the Owner; notify Project Manager promptly upon discovery; protect, remove, handle, and store as directed by Project Manager.

### **B 2.2 Reused Products**

- 1) Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

### **B 2.3 New Products**

- 1) Provide new products unless specifically required or permitted by the Contract Documents.
- 2) All products shall be new and free from defects unless specifically specified otherwise.

### **B 2.4 Product Options**

- 1) Note: "Brand Name or Equal Specification" means a specification that uses one or more manufacturers' names, catalog numbers, or similar identifying characteristics to describe the standard of quality, performance, functionality or other characteristics needed to meet the contracting agency's requirements. Such a specification authorizes Prospective Contractor to offer goods or services that are equivalent or superior to those brands named or described in the specifications. The City shall determine if the proposed substitution is equal or superior based on submittals provided during the Quote process. The City's decision regarding "equal or superior substitutions" shall be issued by Addenda and posted to the City's website prior to the deadline submitting Quotes, allowing everyone to include the approved alternate product if desired.

## **B 3. GENERAL INSTALLATION REQUIREMENTS**

- 1) Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- 2) Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- 3) Make neat transitions between different surfaces, maintaining texture and appearance.

## **B 4. EXCAVATION**

- 1) Perform excavations only in dry weather. Do not excavate saturated materials.
- 2) Maintain excavations free of water. Provide ample and suitable pumps and accessories with which to promptly remove and dispose of water.
- 3) Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.
  - a) If excavated materials intended for fill and backfill include unsatisfactory soil materials

and rock, replace with satisfactory soil materials.

#### **B 4.1 Accessories**

- 1) Warning Tape:
  - a) Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility.

#### **B 4.2 Preparation**

- 1) Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.
- 2) Protect and maintain erosion and sedimentation controls as required by law and best practices.
- 3) Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- 4) Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

#### **B 4.3 Excavation for Walks and Pavement**

- 1) Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.
- 2) The intent of this project is to maintain as much of the existing gravel base as possible for use under the new pavement. Limit excavation to trenches and landscape areas and where grades need to be lowered (at rubber surfacing). Otherwise try to keep area as undisturbed as possible.

#### **B 4.4 Excavation for Utility Trenches**

- 1) Excavate trenches parallel to surface grade.
- 2) Excavate trenches to uniform widths to provide a minimum of 4 inch clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
- 3) Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
  - a) Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material, 4 inches (100 mm) deeper elsewhere, to allow for bedding course.

#### **B 4.5 Subgrade Inspection**

- 1) Proof-roll subgrade before filling or placing aggregate with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades

- 2) Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Project Manager, without additional compensation.

#### **B 4.6 Unauthorized Excavation**

- 1) Fill unauthorized excavation with approved material as directed by the Project Manager.

### **B 5. FILL**

#### **B 5.1 Soil Materials**

- 1) Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- 2) Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- 3) Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- 4) Select Fill: 1 inch minus, clean, well graded, crushed gravel or rock.
- 5) Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1 inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve or use ODOT 3/4 inch- 0-inch Base Aggregate.
- 6) Drainage Course: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2 inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- 7) Backfill and Fill:
  - a) Satisfactory soil materials.
  - b) Initial Trench Backfill: Use ODOT 19.0mm- 0mm (3/4-inch- 0-inch) base aggregate.
  - c) Final Trench Backfill: Refer to bedding course.
- 8) Filtration Soil: Comprised of two thirds sandy loam or loamy sand and one third decomposed organic mulch (by volume) thoroughly mixed together and having a minimum of 12 inches per hour infiltration rate.
  - a) Sandy loam or loamy sand component shall have the following sieve gradation:
    - i. 100 percent passing 1" sieve,
    - ii. 75-100 percent passing #4 sieve,
    - iii. 40-100 percent passing #10 sieve,
    - iv. 15-50 percent passing #40 sieve,
    - v. 5-25 percent passing #100 sieve and
    - vi. 5-15 percent passing #200 sieve.
  - b) Soil shall have a pH tested to be between 6 to 8.

- c) Soils shall not contain wood pieces, plastic and or other foreign mater including detrimental plants material designated by Oregon Department of Agriculture as Type "A" or Type "B" weeds.
  - d) Soil shall be mixed and homogenous, loose and easily broken into small pieces.
- 9) Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefin, polyesters, or polyamide; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
- a) Grab Tensile Strength: 200 lbf; ASTM D 4632.
  - b) Tear Strength: 40 lbf (178 N); ASTM D 4533.
  - c) Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
  - d) Water Flow Rate: 150 gpm per sq. ft. (100 Us per sq. m); ASTM D 4491.
  - e) Apparent Opening Size: Between No. 70 and 100; ASTM D 4751.
  - f) Permittivity: Greater than .10 sec. <sup>-1</sup>

### **B 5.2 Storage of Soil Materials**

- 1) Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - a) Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### **B 5.3 Backfills and Fills**

- 1) Place and compact backfill in excavations promptly, but not before completing the following:
  - a) Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
  - b) Surveying locations of underground utilities for record documents.
  - c) Inspecting and testing underground utilities.
  - d) Removing concrete formwork.
  - e) Removing trash and debris.

### **B 5.4 Utility Trench Backfill**

- 1) Place backfill on subgrades free of mud, frost, snow, or ice.
- 2) Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- 3) Place and compact initial trench backfill material, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the utility pipe or conduit.
  - a) Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- 4) Place and compact final backfill of satisfactory fill to final subgrade elevation.

- 5) Install warning tape directly above utilities, 6 inches below finished grade.

#### **B 5.5 Soil Fill**

- 1) Plow, scarify, bench, or break up surfaces so fill material will bond with existing material.
- 2) Place and compact fill material in layers to required elevations as follows:
  - a) Under grass and planted areas in 8 inch lifts.
  - b) Under walks and pavements, existing gravel as much as possible and provide satisfactory fill material and matching gravel to fill to provide the same cross section as those areas that remain in 6 inch lifts.

#### **B 5.6 Soil Moisture Control**

- 1) Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 3 percent of optimum moisture content.
  - a) Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - b) Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

#### **B 5.7 Compaction of Soil Backfills and Fills**

- 1) Place backfill and fill soil materials in layers not more than 6 inches (150 mm) in loose depth for material compacted by hand-operated tampers.
- 2) Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- 3) Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - a) Under walkways, scarify and re-compact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
  - b) Under lawn or unpaved areas, scarify and re-compact top 8 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material with a water-filled lawn roller.
  - c) For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

#### **B 5.8 Grading**

- 1) General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - a) All grading shall be done so that finish elevations meet and match surrounding elevations and maintain existing slopes and sheet drainage.
- 2) Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

- a) Lawn or Unpaved Areas: Plus or minus 1/2-inch for subgrade and 1/4-inch for finish grading.
- b) Walks: Plus or minus 1/2-inch (13 mm).
- c) Pavements: Plus or minus 1/2-inch (13 mm).

#### **B 5.9 Sub-base and Base Courses**

- 1) Under Plaza and walk paving maintain and use the existing base to the greatest extent possible.
- 2) Place sub-base and base course on subgrades free of mud, frost, snow, or ice.
- 3) On prepared subgrade, place sub-base and base course under pavements and walks as follows:
  - a) Shape sub-base and base course to required crown elevations and cross-slope grades.
  - b) Compact sub-base and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

#### **B 5.10 Drainage Course**

- 1) Place drainage course on subgrades free of mud, frost, snow, or ice under landscaped areas and porous pavement.
- 2) On prepared subgrade, place and compact drainage course under porous concrete slabs-on-grade and filtration soils as follows:
  - a) Line excavated area with enough of the specified drainage filter fabric to completely surround the drainage course including a 6" overlap at seams.
  - b) Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
- a) Compact each layer of drainage course to required cross sections and thicknesses to not less than 92 percent of maximum dry unit weight according to ASTM D 698.

#### **B 5.11 Field Quality Control**

- 1) An independent testing agency will perform field quality control tests.
- 2) Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- 3) Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
  - a) Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area, but in no case fewer than three tests.
  - b) Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.

- 4) When testing agency reports that subgrades, fills, or backfill have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

#### **B 5.12 Protection**

- 1) Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- 2) Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- 3) Where settling occurs before warranty period elapses, remove finished surfacing, backfill with additional material, compact, and reconstruct surfacing.
  - a) Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

#### **B 5.13 Disposal of Surplus and Waste Materials**

- 1) Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

### **B 6. CONCRETE PAVING**

- 1) This Section includes exterior cement concrete pavement for the following:
  - a) Sidewalks, slabs and ramps.
  - b) Decorative concrete pavement (colored concrete).
  - c) Porous concrete pavement

#### **B 6.1 Definitions**

- 1) Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

#### **B 6.2 Submittals**

- 1) Product Data: For each type of manufactured material and product indicated.
- 2) Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- 3) Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
  - a) Cementitious materials
  - b) Steel reinforcement and reinforcement accessories
  - c) Admixtures
  - d) Curing compounds
  - e) Applied finish materials

- f) Bonding agent or epoxy adhesive
  - g) Joint fillers
- 4) Decorative Concrete: Submit product data with manufacture, color, pigments and samples.

### **B 6.3 Quality Assurance**

- 1) Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - a) Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- 2) Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- 3) ACI Publications: Comply with ACI recommendations unless modified by requirements in the Contract Documents.
- 4) Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- 5) Mockups: Cast mockups of Decorative Concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.
  - a) Build mockups in the location and of the size indicated or, if not indicated, as directed by Project Manager.
  - b) Notify Project Manager three days in advance of dates and times when mockups will be constructed.
  - c) Obtain Project Manager's approval of mockups before starting construction.
  - d) Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
  - e) Demolish and remove approved mockups from the site when directed by Project Manager.
  - f) Approved mockups may become part of the completed Work if undisturbed at time of completion and have been approved by Project Manager.
- 6) Pre-installation Conference: Conduct conference at Project site.
  - a) Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices.

### **B 6.4 Project Conditions**

- 1) Traffic Control: Maintain access for vehicular and pedestrian traffic as required for all construction activities.

### **B 6.5 Forms**

- 1) Form Materials: Wood, metal, metal-framed plywood, or other approved materials to provide full-depth, continuous, straight, smooth exposed surfaces.
  - a) Use flexible or curved forms for curves with a radius 100 feet (30.5 m) or less.

- 2) 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.

#### **B 6.6 Steel Reinforcement**

- 1) Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.
- 2) Steel Welded Wire Reinforcement: ASTM A 844/A 884M, deformed, Class A epoxy coated type.
  - a) Flat Sheets
  - b) Mesh Size to be 6" x 6", W2.9 x W2.9
  - c) Maintain 1-1/2" clear of surface. Discontinue at expansion and cold joints.
- 3) Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
  - a) Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

#### **B 6.7 Concrete Materials**

- 1) Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the project:
  - a) Portland Cement: ASTM C 150, Type I or II
    - i. Fly Ash: ASTM C 618, Class C.
- 2) Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded.
- 3) Provide aggregates from a single source.
  - a) Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
  - b) Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- 4) Water: ASTM C 94/C 94M.
- 5) Air-Entraining Admixture: ASTM C 260.
- 6) Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
  - a) Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - b) Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - c) High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

#### **B 6.8 Decorative Concrete Color**

- 1) Product: Integrally colored concrete pavement mix-ready concrete color as manufactured by Davis Colors or approved equal added to the approved concrete mix.

- 2) Manufacturer:
  - a) Davis Colors manufactured by Davis Colors; phone (213) 269-7311.
- 3) Materials: Pigments shall contain pure, concentrated mineral pigments especially processed for mixing into concrete and complying with ASTM C979.
- 4) Color(s):
  - a) Provide colors to be selected by Project Manager from manufacturer's color line.
- 5) Pigments: Comply with manufacturer's instructions. Deliver pigments in original unopened packaging. Store in dry conditions.

#### **B 6.9 Porous Concrete**

- 1) Contractor shall furnish a proposed mix design with proportions of materials prior to commencement of work. The data shall include unit weights determined in accordance with ASTM C29 (latest revision), and ACI 301 and ACI 318. Jigging procedure.
- 2) Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:
  - a) Portland Cement: ASTM C 150, Type I or II or Portland Cement Type IP or IS conforming to ASTM C595 (latest revision).
  - b) Fly Ash: ASTM C 618
  - c) Total cementitious material shall not be less than 600 lbs. per cu.yd.
- 3) Aggregate: Use No 8 coarse aggregate (3/8 to No. 16) per ASTM C33 (latest revision) or No. 89 coarse aggregate (3/8 to No. 50) per ASTM D448 (latest revision). If other gradation of aggregate is to be used, submit data on proposed material to owner for approval. Fine aggregate complying with ASTM C33 shall provide 6%(+/-2%) of total aggregate weight. A minimum of 10% all aggregate shall pass the #4 sieve. Natural rounded aggregates, where available are recommended.
  - a) The volume of aggregate per cu. yd. shall be equal to 18 cu.ft. when calculated as a function of the unit weight determined in accordance with ASTM C29 (latest revision) jigging procedure.
- 4) Water: Potable shall be used.
  - a) Mix water shall be such that the cement paste displays a wet metallic sheen without causing the paste to flow from the aggregate. (Mix water yielding a cement paste with a dull-dry appearance has insufficient water for hydration).
  - b) Water cement ratios can range from 0.34 to 0.40. Insufficient water results in inconsistency in the mix and poor bond strength. High water content results in the paste sealing the void system primarily at the bottom and poor surface bond.
- 5) Air-Entraining Admixture: Shall be used and comply with ASTM C 260.
- 6) Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
  - a) Water-Reducing Admixture: ASTM C 494.
  - b) Water-Reducing and Retarding Admixture: ASTM C 494.

- c) High-Range, Water-Reducing Admixture: ASTM C 494.
- d) Shall be used in accordance with the manufacturer's instructions and recommendations.
- e) A hydration stabilizer is recommended in the design and production of pervious concrete. This stabilizer suspends cement hydration by forming a protective barrier around the cementitious particles, which delays the particles from achieving initial set. The admixture's primary function should be as a hydration stabilizer; however, it must also meet the requirements of ASTM C494 (latest revision) Type B Retarding or Type D Water Reducing/Retarding admixtures.

#### **B 6.10 Curing Materials**

- 1) 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.
- 2) Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- 3) Water: Potable.
- 4) Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- 5) Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- 6) White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.
- 7) Curing Materials shall not stain, damage or mar concrete finishes. .
- 8) Porous concrete has a low water-to-cement ratio and especially susceptible to drying out. Use evaporation preventing techniques such as fogging, curing compound, periodic sprays in addition to covering porous concrete with 6 mil polyethylene film sealed on all edges for curing for a minimum of 7 days.

#### **B 6.11 Related Materials**

- 1) Expansion and Isolation Joint Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber. Use strips full depth of concrete minus ½" for sealant
- 2) Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements.

#### **B 6.12 Concrete Mixtures**

- 1) Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
  - a) Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.
- 2) Proportion mixtures to provide normal-weight concrete with the following properties:
  - a) Compressive Strength (28 Days): 3500 psi.
  - b) Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
  - c) Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

- 3) Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
  - a) Air Content: 6 percent plus or minus 1.5 percent for 1-inch (25-mm) nominal maximum aggregate size.
- 4) Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m).

### **B 6.13 Concrete Mixing**

- 1) Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.
  - a) When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- 2) Pigments: Mix in accordance with manufacturer's Instructions. Mix until pigments are uniformly dispersed throughout mixture and disintegrating bags, if used, have disintegrated. Mix so that color is uniform across batches.
- 3) Porous concrete: Truck mixers shall be operated at the speed designated as mixing speed by the manufacturer for 75 to 100 revolutions of the drum. Mixture may be transported or mixed on site with a volumetric mixer (mobile batch plants) and should be used within one (1) hour of the introduction of mix water, unless otherwise approved by an Engineer. This time can be increased to 90 minutes when utilizing the hydration stabilizer specified above.

### **B 6.14 Examination**

- 1) Examine exposed subgrades and sub-base surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- 2) Proof-roll prepared sub-base surface with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
- 3) Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

### **B 6.15 Preparation**

- 1) Remove loose material from compacted sub-base surface immediately before placing concrete.

### **B 6.16 Edge Forms and Screed Construction**

- 1) Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- 2) Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

### **B 6.17 Steel Reinforcement**

- 1) General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and

supporting reinforcement.

- 2) Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- 3) Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- 4) Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### **B 6.18 Joints**

- 1) General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
  - a) When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- 2) Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
  - a) Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
  - b) Provide tie bars at sides of pavement strips where indicated.
  - c) Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - d) Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
  - e) Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- 3) Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
  - a) Locate expansion joints at intervals of 50 feet (15.25 m) unless otherwise indicated.
  - b) Extend joint fillers full width and depth of joint.
  - c) Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
  - d) Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
  - e) Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
  - f) Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

- 4) Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
  - a) Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
  - b) Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
  - c) Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.
- 5) Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
- 6) On Porous concrete, the Contractor shall construct contraction joints in the porous concrete using a roller groover. Joints shall be 1/4 of the pavement thickness.

#### **B 6.19 Concrete Placement**

- 1) Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- 2) Remove snow, ice, or frost from sub-base surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- 3) Moisten sub-base to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- 4) Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete. Do not add water to concrete during delivery or at Project site.
- 5) Do not add water to fresh concrete after testing.
- 6) Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- 7) Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
- 8) Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Project Manager.
- 9) Screed pavement surfaces with a straightedge and strike off.
- 10) Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

- 11) When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.
- 12) Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - a) When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
  - b) Do not use frozen materials or materials containing ice or snow.
  - c) Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- 13) Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
  - a) Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  - b) Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.
  - c) General: Do not add water to concrete surfaces during finishing operations.
- 14) Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
  - a) Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
- 15) Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4 inch (6 mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
- 16) Placing Porous Concrete:
  - a) Prior to placing concrete, the sub-base shall be moistened and in a wet condition. Failure to provide a moist sub-base will result in a reduction in strength of the pavement.
  - b) Concrete shall be deposited as close to its final position as practicable and such that fresh concrete enters the mass of previously placed concrete. The practice of discharging onto subgrade and pulling or shoveling to final placement is not allowed.
  - c) Placing, finishing, and tooled jointing must be completed within 20 minutes from the time the pervious concrete is discharged from the truck.
  - d) The pervious concrete pavement will be placed to the required cross section and shall not deviate more than  $\pm 3/8$  inch in 10 feet from profile grade.
  - e) If placing equipment does not provide the minimum specified vertical force (10 psi vertical

force), a full width roller or other full width compaction device that provides sufficient compactive effort shall be used immediately following the strike-off operation.

- f) Strike off the pervious concrete 1/2" to 3/4" above the final grade prior to compaction by hand for sidewalks. Care must be taken to avoid filling voids in the concrete. After mechanical or other approved strike-off and compaction operation, no other finishing operation other than jointing will be allowed.

### **B 6.20 Concrete Protection and Curing**

- 1) General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- 2) Comply with ACI 306.1 for cold-weather protection.
- 3) Evaporation Retarder: Apply evaporation retarder 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.
- 4) Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- 5) Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:
  - a) Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - i. Water
    - ii. Continuous water-fog spray
    - iii. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
  - b) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  - c) Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. Assure that the curing compounds used do not stain, mar or damage the finish of the concrete.

### **B 6.21 Pavement Tolerances**

- 1) Comply with tolerances of ACI 117 and as follows:
  - a) Elevation: 1/4 inch (6 mm)
  - b) Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm)
  - c) Surface: Gap below 10-foot- (3-m-) long, unlevelled straightedge not to exceed 1/4 inch (6 mm)
  - d) Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch (25 mm)
  - e) Vertical Alignment of Tie Bars and Dowels: 1/4 inch (6 mm)

- f) Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch (13 mm)
- g) Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm)
- h) Joint Spacing: 1/2 inch (12.5 mm)
- i) Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus
- j) Joint Width: Plus 1/8 inch (3 mm), no minus

### **B 6.22 Field Quality Control**

- 1) Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- 2) Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  - a) Testing Frequency: Obtain at least 1 composite sample for each 500 sq. ft. (465 sq. m) or fraction thereof of each concrete mix placed each day and one for each color.
    - i. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  - b) Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
  - c) Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
  - d) Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
  - e) Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
  - f) Compressive Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
    - i. A compressive strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- 3) Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive strength tests equals or exceeds specified compressive strength and no compressive strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- 4) Test results shall be reported in writing to Project Manager, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- 5) Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be

permitted by Project Manager but will not be used as sole basis for approval or rejection of concrete.

- 6) Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Project Manager.
- 7) Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- 8) Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

#### **B 6.23 Repairs and Protection**

- 1) Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements.
- 2) Drill test cores, where directed by Project Manager, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- 3) Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- 4) Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for inspections.

#### **B 7. RUBBER TILES**

- 1) Contract Documents are based on products supplied by; RB Rubber Products, Inc., 904 NE 10<sup>th</sup> Avenue, McMinnville, OR 97128.
- 2) Alternative and Allowances:
  - a) Resilient rubber surfaces to be considered equal or better than Bounce Back playground safety surfacing must be approved by the Project Manager in writing prior to the deadline for submission of quotes.
- 3) Description: RB Rubber Products (or approved equal) shall provide all necessary material components and installation instructions required to install the Bounce Back playground safety surfacing.
- 4) Quality Assurance:
  - a) Tiles shall be warranted by the manufacturer for any defects in material and workmanship for a period of 10 years from the date of purchase.
  - b) ISO 9001-2000 registered company.
  - c) Installation instructions shall be provided by manufacturer.
- 5) Design and Use:
  - a) Tiles are designed to provide an impact absorbing resilient safety surface which is utilized in the fall area or safety zones around playground equipment.
  - b) Tiles shall meet the Consumer Product Safety Commission (CPSC) and American with

Disability Act (ADA) requirements tested by the American Society for Testing and Material (ASTM) methods. Tiles shall meet the Head Injury Criteria (HIC) tests for applicable fall heights and shall be certified by the International Play Equipment Manufacturers Association (IPEMA).

- c) Tiles shall be installed over concrete.
  - d) The structural performance and conditions of the substrates shall be evaluated and approved by the installer prior to the installation of the Tiles. Installer shall also evaluate and approve the required drainage and gradient prior to installation of the safety surfacing.
- 6) Submittals: Playground safety surfacing samples shall be submitted manufacturer.
- 7) Delivery, Storage and Handling:
- a) All materials shall be delivered in good condition in the original packaging materials with product information intact.
  - b) Materials shall be protected from weather and shall be stored in temperatures of 40 F (4 C) or higher.
  - c) Materials shall not be subjected to solvents or other damaging chemicals.
- 8) Installation Conditions:
- a) At the time of installation, ambient air temperature shall meet manufacturer's recommendations.
  - b) Materials shall be protected from weather, solvents and other damage prior to and during installation and during the adhesive curing process.

### **B 7.1 Rubber Products**

- 1) Dimensions: Tiles: 24" x 24" x 1.75"
- 2) Features:
  - a) Resilient rubber surface made exclusively from re-claimed rubber
  - b) Water permeable design for dry play surface
  - c) "100 leg" egg-carton pattern bottom for greater fall protection
  - d) Easy urethane adhesive (glue down) installation
  - e) Meets or exceeds ADA & CPSC requirements & ASTM tests
  - f) 1-in-6 Slope transitions and corners
  - g) 1-in-12 Slope ADA ramps
  - h) Virtually maintenance free
- 3) Colors
  - a) Green chosen from standard manufacturer's color selection.
- 4) Materials:
  - a) Tiles shall be produced in a square configuration in 24" x 24" x 1.75" size with hollow

vertical cavities and comprised of 100 “legs” on the bottom (2 1/4”, 2 1/2”, 3 1/2”, 4”) and a color top surface. Each tile is 4 square feet and is comprised of rubber obtained exclusively from the recycling of re-claimed tires. Uniform density throughout prevents particulate separation and provides maximum resilience and adhesive attachment.

- b) Fall Protection: Shall have been tested and passed for shock attention under ASTM F 1292-99 G-Max and HIC (Head Injury Criteria) for the appropriate/corresponding fall height.
- 5) Shall have the following technical specification:

Abrasion Resistance (ASTM D 4060)	Durability: Wear Index-657 Avg.
Tear Strength (ASTM D 624)	Durability: 124 lbf/in. & psi avg
Coefficient Of Friction* (ASTM C 1028)	0.65 dry, 0.63 wet
Water Permeability*	0.27 gal/min/sq. yd
Lead Content (ASTM D 4004)	CPSIA Approved
Weatherization Test (ASTM C 67 & D 573)	There were no signs of failure of the play tiles after the freeze-thaw and drying conditioning.
Fall Height Criteria (ASTM F 1292-99)	Bounce Back Playground Tiles met their respective design fall height criteria.

Note: ASTM = American Standard for Testing Materials  
 \*Test conducted on Color Top and EPDM material

**B 7.2 Rubber Installation Preparation**

- 1) Inspection: Installer shall evaluate the substrate’s structural integrity and performance prior to the installation of Tiles. Project Manager, and Contractors shall be notified of all discrepancies. Work shall not continue until all unsatisfactory conditions are rectified.
- 2) Installation: Tiles shall be cut, aligned and installed as required onto the substrate with sufficient adhesive as recommended according to the manufacturer’s guidelines.
- 3) **DO NOT** use recycled rubber products in conjunction with any petroleum based products. This includes solvents, adhesives or sealants. All substrates (especially new concrete) must be fully cured for a minimum of 10 days prior to installing rubber tiles.
- 4) Upon Delivery of Product:
  - a) VERIFY packing slip matches with product and order.
  - b) INSPECT delivered product thoroughly. Report any discrepancies of original order, product defects, etc. No reimbursement/warranty claim will be given for labor on material installed with visual defects. Any defects – size, color, or otherwise – must be reported to the place of purchase prior to installation.
  - c) STORE product and adhesives according to manufacturer’s recommendations.
  - d) READ product and subsurface floor preparation, instructions, warranty and other disclaimers carefully and completely before beginning any installation.
- 5) Adhesive
  - a) CX-941 Trowel Grade Adhesive or CX-948 Gun Grade Adhesive or as required by manufacturer’s recommendations.
  - b) Protect unopened containers from heat and direct sunlight and store according to manufacturer’s recommendations.

- c) Do not apply on frozen surfaces or standing water.
  - d) Avoid contact with water or alcohol before use and before complete cure.
  - e) Do not use in areas subject to hydrostatic head pressure.
  - f) Do not use on wet, contaminated, or friable substrates.
  - g) It is the Contractor's responsibility to check adhesion of the cured adhesive on typical test areas at the project BEFORE application.
  - h) **DO NOT USE** petroleum based products to clean RB Rubber Bounce Back Playground Tiles.
- 7) Rubber Tile Cleaning:
- a) Outdoors: Use of a water hose, leaf blower or broom is usually sufficient.
  - b) Use products as outlined in manufacturer's recommendations.
- 8) Preparation:
- a) Tiles should be protected from weather and physical damage prior to and during installation as well as during adhesive curing period. Precipitation should be avoided during and for 12 hours after installation.

### **B 7.3 Rubber Sub-Base**

- 1) Requirements for all sub-surface are as follows:
- a) All play structures should be in place prior to Tile installation.
  - b) Be reasonably flat and free of variances of more than 1/8" in 10 feet.
- 2) Concrete and Asphalt:
- a) New concrete must be allowed to fully cure thoroughly prior to installation (10 days, less if manufacturer's recommendations allow). If sealants are used, **DO NOT** use one with a petroleum base.
  - b) All cracks or flaws should be filled in or repaired prior to covering with rubber products. Use patching materials as appropriate. Remove curing and parting compounds and other surface hardeners and floor coatings in accordance with the manufacturer's instructions.
  - c) Surface must be thoroughly cleaned of dirt, dust, grease, or other foreign matter by shot blasting or other mechanical means with a commercial degreaser. Any bumps or debris will cause excess wear and/or cushion damage.
  - d) Allow the surface to completely dry before beginning installation.

### **B 7.4 Rubber Installation**

- 1) Start by laying full tiles along the insides of the two perpendicular lines. Continue laying full tiles until play area is covered except for cut-in area around the fountain. Be careful to keep the seams straight.
- a) Using Full Floor Adhesive and Tile to Tile Adhesives as recommended by manufacturer. **DO NOT** allow mineral spirits to come in contact with the rubber tiles.
  - b) It is **strongly recommended** to use both methods of adhesion when installing product or Geotextile fabric sub-surface. Using both of the above mentioned adhesive procedures will ensure the most long-term, trouble-free installation of the tile product unless

otherwise stated in manufacturer's recommendations.

- 2) Once full tiles are in place measure and fit each remaining tile around the fountain.
- 3) Adhesive Clean-up Tips: When cleaning tools DO NOT allow mineral spirits to come in contact with the rubber tiles.
- 4) Curing times:
  - a) Standard Set: Firm Set 1-2 Hours, Light Traffic: 8-10 Hours , Normal Traffic: 48 Hours or as required by manufacturer's recommendations

#### **B 7.5 Product Warranty**

- 1) Provide a guarantee that the products are free of manufacturing defects in material and workmanship for a minimum 10 years ("Warranty Period").

#### **B 8.0 COMPOSITE DECKING**

- 1) References
  - a) ASTM D-7032-04: Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International
  - b) ASTM D-7031-04: Standard Guide for Evaluating Mechanical and Physical Properties of Wood-Plastic Composite Products, ASTM International
  - c) ASTM E-84-01: Test Method for Surface Burning Characteristics of Building Materials, ASTM International
  - d) ASTM D 570: Water Absorption of Plastics
  - e) ASTM D 1761: Mechanical Fasteners in Wood
  - f) ASTM D -1413-99: Test method for Wood Preservatives by Laboratory Soilblock Cultures
  - g) ASTM C177: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

#### **B 8.1 Design/Performance Requirements**

- 1) Structural Performance
  - a) Deck: Uniform Load- 100lbf/sq.ft
  - b) Tread of Stairs: Concentrated Load: 750 lf/sq.ft., and 1.8" max. deflection with a concentrated load of 300 lbf on area of 4 sq. in
  - c) Fire-Test Response Characteristics per ASTM E-84
- 2) Submittals
  - a) Product Data Indicate sizes, profiles, surface style, and performance characteristics
  - b) Samples: For each product specified, one sample representing actual product color, size, and finish.
- 3) Delivery, Storage, and Handling
  - a) Store Trex products on a flat and level surface. Adjust support blocks accordingly.
  - b) Support Trex bundles on supplied dunnage.

- c) When stacking Trex bundles, supports should start at each end and be spaced 2' (0.61m) on center. Supports should align vertically.
- d) Do not stack Trex higher than 6 bundles on 12' high.
- e) Keep material covered using the provided bundle cover until time of installation.
- f) Follow manufacture's storage recommendations;

**B 8.2 Warranty**

- 1) Provide manufactures warranty against rot, decay, splitting, checking, splintering, fungal damage, and termite damage for a period of 25 years for a residential installation and 10 years for a commercial installation. In addition provide the Trex Transcend and Trex Enhance Fade and Stain Warranty against food staining and fading beyond 5 Delta E (CIE units) for a period of 25 years for a residential installation and 10 years for a commercial installation. Specific terms for warranties can be found at; [www.Trex.com](http://www.Trex.com).
  - a) Manufacturers
    - i. Contract Documents are based on products supplied by; Trex Company, Inc., 160 Exeter Dr., Winchester, VA 22603.
    - ii. Substitutions: Equal or better products may be submitted for approval and must be approved by the Architect and the City's Project Manager in writing prior to the deadline for submission of quotes.

**B 8.3 Decking System**

- 1) Wood-Plastic Composite Lumber;
  - a) Material Description: Composite Decking consisting of recycled Linear Low Density Polyethylene (LLDPE) and recycled wood. The product is extruded into shapes and sizes as follows:
    - i) Trex Transcend and Trex Enhance Decking Boards; 1 x 5.5"
    - ii) Lengths - 12, 16, and 20 feet
  - b) Color- To be specified by owner from Trex standard list of colors.
- 2) Physical and Mechanical Properties as follows:

Test	Test Method	Value	
Flame spread	ASTM E 84	60	
Thermal Expansion		3.5 x 10-5 inch/inch/degreeF	
Moisture Absorption		< 1%	
Nail Withdrawal		163 lbs/in	
Screw Withdrawal		558 lbs/in	
Fungus Resistance		Rating - no decay	
Termite Resistance		Rating = 9.6	
		<b>Ultimate (Typical)Values *</b>	<b>Design Values</b>
Compression Parallel		836 psi	540 psi

Compression Perpendicular			
Tensile Strength		1562 psi	500 psi
Shear Strength		559 psi	360 psi
Modulus of Elasticity		412,000 psi	200,000

\* Ultimate strength values are not meant for design analysis. Design values are for temperatures up to 130F (54C).

- 3) Fasteners:
  - a) Trex Universal Hideaway Hidden fasteners
  - b) Screws; See Trex.com for the updated recommendations on fasteners.
- 4) Execution:
  - a) Install according to Trex installation guidelines.
  - b) Cut, drill, and rout using carbide tipped blades. Do not use composite wood material for structural applications
- 5) Cleaning:
  - a) Following cleaning recommendations as found in Trex installation guide:
- 6) Deck Structure:
  - a) All lumber shall be grade #2 Douglas-Fir, Hem-Fir, or better and shall be pressure treated (to resist insect and dry rot) in accordance with American Wood-Preservers' Association Standards (Category). Deck surface and trim material of Composite lumber. The level of treatment depends on the use as follows:
    - i) Decking material, railings, joists, and beams must be treated to a Category UC3B (or must be other wood with a natural resistance to decay).
    - ii) Posts and other woods located on, in, or in contact with the ground must be a Category UC4B.
    - iii) Any wood less than six inches above the ground or in contact with concrete must be a Category UC4A.
    - iv) The level of preservative treatment is noted on the tags on the ends of the wood members. Remember, any time you make a cut, treat the cut end of the wood with a paint-on preservative. Cut ends expose the inner untreated wood to potential moisture and insect damage.
- 7) New pressure treatment methods use chemicals that will prematurely corrode standard fasteners, hardware, and flashing when in contact with pressure treated lumber; and as a result, fastener and hardware requirements have changed. Note the following:
  - a) All screws and nails shall be hot-dipped galvanized or stainless steel.
  - b) All hardware (bolts, nuts and washers, joist hangers, mechanical fasteners, hold downs, tie plates cast-in-place post anchors, etc.) shall be galvanized with 1.85 oz/sf of zinc (G-185 coating) or shall be stainless steel. Look for products such as "Zmax" from Simpson Strong-Tie or "Triple Zinc" from USP.
  - c) All decking material shall be 1 x 6 (nominal) composite boards. Attach decking with hidden fasteners as specified. Decking may be placed from an angle perpendicular to the joists to an angle of 45 degrees to the joists. Decking must have a span length such that each board bears on a minimum of two joists.

- d) The bottom of all footings for are to be placed a minimum of 18 inches below the surface of the finished grade and must bear on firm, undisturbed native soil.

## **B 9.0 IRRIGATION**

- 1) Contract Documents are based on products supplied by Rain Bird. This sections specification information is for Rain Bird low volume dripline irrigation products including Control Zone Kits, XFD, XFCV, XFS Dripline, compatible fittings, and Low Volume Emission Devices.
- 2) Alternative and Allowances:
  - b) Other irrigation products to be considered equal or better to the Rain Bird Irrigation product specified must be approved by the Project Manager in writing prior to the deadline for submission of quotes.
- 3) Provide design, labor, materials, supplies, equipment, tools, and transportation, and perform all operations in connection with and reasonably incidental to the complete installation of the drip irrigation system, and guarantee/warranty installation. Existing system layout is provided for Contractor to use to tie this design in to the existing system.

## **B 9.1 Submittals**

- 1) Deliver two (2) copies of design submittals to Owner's Representative within ten (10) working days from date of Notice to Proceed. Furnish information in 3-ring binder with table of contents and index sheet. Index sections for different components and label with specification section number and name of component. Furnish submittals for components on material list. Indicate which items are being supplied on catalog cut sheets when multiple items are shown on one sheet. Incomplete submittals will be returned without review.
- 2) Materials List: Include dripline and low-volume irrigation components, control zone components, shop drawings and other components shown on drawings and installation details or described herein. Quantities of materials need not be included.
- 3) Manufacturers' Data: Submit manufacturers' catalog cuts, specifications, and operating instructions for equipment shown on materials list.
- 4) Design and Shop Drawings: Submit shop and design drawings to properly irrigate the planting areas shown in these plans and specifications. Show products required for proper installation, their relative locations, and critical dimensions. Note modifications to installation details as part of shop drawing documentation.

## **B 9.2 Flushing and Testing**

- 1) Schedule testing with Owner's Representative a minimum of three (3) days in advance of testing.
- 2) Provide clean, clear water, pumps, labor, fittings, and equipment necessary to conduct line flushing and testing procedures.
- 3) Recommended Dripline and Emitter Lateral Flushing Procedures.
  - a) Flush the system every week for the duration of the contract period and check the water that is flushed out for cleanliness. Establish a regular system flushing schedule for the future based on results from the initial six-week flushing schedule.
  - b) Flush the system completely after any repairs are made and monitor system operation closely under regular system flushing schedule.

- c) Check the pressure at the supply and flush headers on a regular basis and compare with the pressure readings taken after installation.
- 4) Recommended Dripline and Emitter Lateral Leakage Testing Procedures.
  - a) Subject installed dripline tubing and emitter lateral piping to water pressure equal to specified operating pressure for ten (10) minutes. Test with control zone components and dripline flush valve components installed.
  - b) Partially backfill buried pipe and tubing to prevent movement under pressure. Expose couplings, fittings, and valve components.
- 5) Visually inspect valve assemblies and fittings for leakage and replace defective pipe, fitting, joint, valve, or appurtenance. Repeat test until test segment is free from leaks. Cement or caulking to seal leaks is prohibited. Recommended Dripline and Emitter Lateral Operational Testing Procedures.
  - a) Activate each dripline and emitter lateral control zone valve in sequence from controller. Provide either one additional person with radio or use handheld remote to activate remote control valves from controller. Manually activating remote control valve using manual bleed mechanism at remote control valve is not an acceptable method of activation. Owner's Representative will visually observe operation, water application patterns, and leakage.
  - b) Replace or adjust defective valve, fitting, dripline segment, emitter lateral segment, or appurtenance to correct operational and coverage uniformity deficiencies.
  - c) Repeat test(s) until each dripline or emitter lateral test segment passes testing procedures. Repeat tests, replace components, and correct deficiencies at no additional cost to Owner and/or Owner's Representative.

**B 9.3 Construction Review**

- 1) The purpose of on-site reviews by Owner's Representative is to periodically observe work in progress, Contractor's interpretation of construction documents, and to address questions with regard to installation.
- 2) Schedule reviews for dripline layout and system testing with Owner's Representative as indicated on drawings or as required by these specifications.
- 3) Impromptu reviews may occur at any time during project.
- 4) A review will occur at completion of irrigation system installation and Project Record Drawing submittal.

**B 9.4 Guaranty/Warranty and Replacement**

- 1) The purpose of guaranty/warranty is to ensure that Owner receives irrigation materials of prime quality, installed and maintained in thorough and careful manner.
- 2) Contractor is responsible for providing guaranty/warranty of irrigation materials, equipment, and workmanship against defects for period of one (1) year from formal written acceptance by City. Make repairs within seven (7) days of notification from Owner's Representative.
- 3) Replace damaged items with new and identical materials, using methods specified in contract documents or applicable codes. Make replacements at no additional cost to contract price.
- 4) Guarantee/warranty applies to originally installed materials and equipment, and replacements made during guaranty/warranty period.

### **B 9.5 Main and Lateral Piping and Sleeves**

- 1) Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with integral belled end suitable for solvent welding. Use Class 200, SDR-21, rated at 200 PSI (13,8 bar), conforming to dimensions and tolerances established by ASTM Standard D2241. Use PVC pipe rated at higher pressures than Class 200 in the cases where small nominal diameters are not manufactured in Class 200.
- 2) Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standards D2466 and D1784 for PVC pipe. Use primer approved by pipe manufacturer. Solvent cement to conform to ASTM Standard D2564, of type approved by pipe manufacturer.
- 3) Use PVC Schedule 80 nipples and PVC Schedule 40 or 80 threaded fittings for threaded pipe connections as specified on the drawings and details.
- 4) Threaded joint sealant: Use non-hardening, nontoxic pipe thread sealant formulated for use on threaded connections and approved by pipe fitting or valve manufacturer.
- 5) Sleeves shall be of the size and quantity shown on drawings.
  - a) Use Schedule 40 pipe and fittings.

### **B 9.5 Drip Irrigation Components**

- 1) Rain Bird Control Zone Kits
  - a) General Information:
    - i. Provide control zone kits manufactured by Rain Bird.
    - ii. Control zone kit assemblies for dripline irrigation zones must include control valve, filtration, and pressure regulation components sized to meet the hydraulic demands and flow requirements of the zones that they service.
  - b) Rain Bird Medium Flow Commercial Control Zone Kits for dripline zones with flows from 3.0 to 20.0 GPM (11.4 to 75.7 lpm), including, Rain Bird PESB valve with PVC ball valve and pressure regulating quick-check basket filter and Rain Bird PGA valve with pressure regulating basket filter.
    - i. PESB Available model numbers:
      - 1) X CZ-100-PRB-COM [1" (25 mm) PVC ball valve, 1" (25 mm) Rain Bird PESB valve, and 1" (25 mm) PRB-QKCHK-100 quick check pressure regulating basket filter]
    - ii. PESB valve assembly component specifications must include:
      - 1) 1" (25 mm) PVC full-port ball valve with female threaded inlet and outlet connections.
      - 2) PESB valve body and bonnet constructed of durable glass-filled nylon, stainless steel and other chemical/UV resistant materials.
      - 3) Diaphragm constructed of a durable Buna-N rubber material reinforced with nylon.
      - 4) One-piece solenoid with captured plunger and 90 mesh (200 micron) solenoid filter.
      - 5) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations.
      - 6) Inlet pressure rating: 20 to 200 PSI (1,4 to 13,8 bar).

- 7) Female threaded inlet and outlet connections.
- iii. PGA Available model number:
  - 1) XCZ-100-PRB-LC [1" (25 mm) Rain Bird PGA valve, and 1" (25 mm) PRB -100 pressure regulating basket filter]
- iv. PGA valve assembly component specifications must include:
  - 1) PGA valve body and bonnet constructed of durable glass-filled nylon, stainless steel and other chemical/UV resistant materials.
  - 2) Diaphragm constructed of a durable Buna-N rubber material reinforced with nylon.
  - 3) One-piece solenoid with captured plunger and 90 mesh (200 micron) solenoid filter.
  - 4) External bleed for manual system flushing during start-up, internal bleed for manual zone activation during maintenance operations.
  - 5) Inlet pressure rating: 15 to 150 PSI (1,4 to 13,8 bar).
  - 6) Female threaded inlet and outlet connections.
- v. Pressure Regulating Quick Check Basket Filter combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system. Pressure regulating basket filter component specifications must include:
  - 1) Basket style body and jar-top cap constructed of heavy-duty glass-filled, UV-resistant polypropylene, with 150 PSI (10,3 bar) operating pressure rating. Maximum dimensions of filter body; Height: 6 1/2" (16,5 cm), Length: 6 1/2" (16,5 cm), Width: 3 1/2" (8,9 cm).
  - 2) Indicator incorporated into filter cap that changes color from green to red during operation when the filter element requires cleaning.
  - 3) Standard 200 mesh (75 micron) filter screen constructed of stainless steel attached to propylene frame. Screen is serviceable for cleaning purposes by unscrewing cap from filter body and removing filter element.
  - 4) Normally-open in-line pressure regulating device, constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 PSI (10,3 bar), with preset outlet pressure of approximately 40 PSI (2,8 bar). Pressure regulating device allows full flow with minimal pressure loss unless inlet pressure is greater than preset level. As inlet pressure increases above preset level, internal spring compresses to reduce downstream pressure.
  - 5) Male threaded 1" (25 mm) inlet and outlet connections.

2) Rain Bird XF Series Dripline Components

- a) General Information:
  - i. Provide flexible dual-layered pressure-compensating inline XF Series Dripline manufactured by Rain Bird, with emitter spacing and dripline row spacing as indicated on design drawings.
  - ii. Provide insert or compression fittings manufactured by Rain Bird that are compatible with inline emitter tubing as indicated on construction drawings.
- b) Rain Bird XFD On-Surface Dripline with pressure-compensating inline emitters.
- c) Rain Bird XFCV Dripline with Heavy-Duty Check Valve and pressure-compensating inline

emitters.

- d) Rain Bird XF Series Blank Dripline Tubing
  - e) Rain Bird Easy Fit Dripline Tubing Compression Fittings
  - f) Rain Bird XF Series Dripline Tubing Insert Fittings
  - g) Rain Bird Air Relief Valves
- 3) Rain Bird Point Source Irrigation Emission Devices
- a) General Information:
    - i. Provide low-volume point-source emission devices, manufactured by Rain Bird, to efficiently deliver irrigation water at the plant root zone as indicated on construction drawings.
  - b) Rain Bird Single-outlet Xeri-Bug™ Emitters
  - c) Rain Bird Single-outlet Pressure-Compensating Modules
  - d) Rain Bird Multi-outlet Xeri-Bug Emission Devices
  - e) Rain Bird 6-outlet Manifold Emission Device
  - f) Rain Bird Multi-Outlet Xeri-Bird™ 8 Emission Device
  - g) Rain Bird Drip Irrigation Accessories
  - h) Rain Bird Diffuser Bug Cap

## **9.6 Inspections and Reviews**

- 1) Pre-construction Site Inspection
  - a) Verify construction site conditions and note irregularities affecting work of this section. Report irregularities in writing to Owner's Representative prior to beginning work. Commencement of work implies acceptance of existing site conditions.
- 2) Utility Locates ("Call Before You Dig")
  - a) Arrange and coordinate Utility Locates with local authorities prior to construction.
  - b) Repair underground utilities that are damaged during construction. Make repairs at no additional cost to contract price.

## **9.7 Dripline Layout of Work**

- 1) Stake out dripline irrigation system. Items staked include manifold/header pipe and tubing, sleeves, control zone assemblies, flush valves, air relief valves, and check valves.
- 2) Dripline Irrigation System Layout Review: Dripline irrigation system layout review will occur after staking has been completed. Notify Owner's Representative one week in advance of review. Modifications will be identified by Owner's Representative at this review.

## **9.8 Dripline Excavation, Trenching, and Backfill**

- 1) Excavate and install pipes at minimum cover indicated in drawings or specifications. Excavate trenches at appropriate width for connections and fittings.
- 2) Minimum cover for dripline components (distance from top of pipe to finish grade):

- a) Buried PVC manifold and supply header pipe to dripline grid layouts: 12" (30.5 cm) to top of pipe.
  - b) Buried dripline lateral pipe downstream PVC manifold and supply header pipe: 4" (10 cm) to top of pipe.
  - c) On-grade dripline lateral pipe downstream PVC manifold and supply header pipe: Secure to finish grade with approved tubing stakes. Install and test prior to installation of landscape fabric and mulch.
- 3) Backfill only after buried lines have been reviewed, tested, and approved.
  - 4) Excavated material is generally satisfactory for backfill. Use backfill free from rubbish, vegetable matter, frozen materials, and stones larger than 2" (50 mm) in maximum diameter. Remove material not suitable for backfill. Use backfill free of sharp objects next to pipe.
  - 5) Dress backfilled areas to original grade. Incorporate excess backfill into existing site grades. Dispose of excess backfill off site.
  - 6) Contact Owner's Representative for trench depth adjustments where utilities conflict with irrigation trenching and pipe work.

### **9.9 Assembling Pipe and Fittings**

- 1) General:
  - a) Keep pipe free from dirt and debris. Cut pipe ends square, debur and clean as recommended by pipe manufacturer.
  - b) Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.
- 2) PVC Pipe and Fittings:
  - a) Use only strap-type friction wrenches for threaded plastic pipe.
  - b) PVC Solvent Weld Pipe and Fittings:
    - i. Use appropriate primer and solvent cement. Join pipe in manner recommended by pipe and fitting manufacturers and in accordance with accepted industry practices.
    - ii. Cure for thirty (30) minutes before handling and twenty-four (24) hours before pressurizing or installing with vibratory plow.
    - iii. Snake pipe from side to side within trench.
  - c) PVC Threaded Connections:
    - i. Use only factory-formed threads. Field-cut threads are not permitted.
    - ii. Apply thread sealant in manner recommended by component, pipe and sealant manufacturers and in accordance with accepted industry practices.
- 3) Dripline Tubing and Fittings:
  - a) Use only Rain Bird XF-Series Insert Fittings or Rain Bird Easy Fit Compression Fittings for Rain Bird XF-Series dripline tubing connections or transitions as recommended by the Manufacturer's representative for the specific site and system conditions.
  - b) Dripline Insert Fittings:
    - i. Install dripline tubing and fittings in manner recommended by manufacturer and in

accordance with accepted industry practices.

- c) Dripline Compression Fittings:
  - i. Install dripline tubing and fittings in manner recommended by manufacturer and in accordance with accepted industry practices.

### **9.10 Installation of Dripline Irrigation Components**

- 1) Control Zone Kit Assembly:
  - a) Flush mainline pipe before installing Control Zone Kit assembly.
  - b) Locate where shown on drawings. Connect control wires to remote control valve wires using specified wire connectors and waterproof sealant. Provide connectors and sealant per manufacturer's recommendations.
  - c) Install a maximum of four (4) Low Flow or Medium Flow Control Zone Kits per standard rectangular valve box. Install a maximum of one (1) Medium Flow Commercial Control Zone Kits per standard rectangular valve box. Install a maximum of one High Flow Commercial Control Zone Kits per jumbo rectangular valve box.
    - i. Locate valve boxes at least 12" (30.5 cm) from, and align with, nearby walls or edges of paved areas.
    - ii. Group Control Zone Kit assemblies together where practical. Align grouped valve boxes in uniform patterns. Allow at least 12" (30.5 cm) between valve boxes.
    - iii. Brand controller letter and station numbers on valve box lid in 2" (50 mm) high letters.
- 2) Lateral Piping and Dripline Tubing:
  - a) Install lateral piping and dripline tubing at locations and in grid patterns as indicated on drawings and installation details, and in strict accordance with manufacturer recommendations.
  - b) Thoroughly flush PVC lateral piping, supply headers, and dripline tubing immediately upon installation.
- 3) Air Relief Valve Kit Assembly: Install at all high points in dripline tubing grid as shown and directed on drawings and installation details.
- 4) Flush Point Assembly: Install in flush header or at ends of each dripline zone segment as shown and directed on drawings and installation details. Install at least 12-inches from and align with adjacent walls or edges of paved areas.

### **9.11 Project Record (As-Built) Drawings**

- 1) Document field changes from original design and construction documents. Maintain on-site and separate from original construction documents, one complete set of documents labeled "Project Field Documents". Keep documents current. Do not permanently cover work until accurate "as-built" information is recorded.
- 2) Record pipe network alterations on a daily basis. Record work that is installed differently than shown on construction documents. Record accurate reference dimensions, measured from at least two permanent reference points, of each control zone kit assembly, each dripline zone boundary, each air relief valve assembly, each flush point assembly, and other dripline irrigation components enclosed within valve box.
- 3) Obtain from Owner's Representative one set of reproducible Mylar drawings or CAD files prior to

construction completion. Duplicate information contained on "Project Field Documents" maintained on-site using technical drafting pen or AutoCAD. Label each sheet "Record Drawing".

- 4) Provide "Record Drawings" to Owner's Representative. Completion of Record Drawings is required prior to final construction review at completion of irrigation system installation.

#### **9.12 Winterization and Spring Start-up**

- 1) Winterize irrigation system in fall following completion, or partial completion, of irrigation system construction. Start-up irrigation system in spring following completion, or partial completion, of irrigation system construction. Repair any damage caused by improper winterization at no additional cost to Owner. Coordinate winterization and start-up with landscape maintenance personnel.

#### **9.13 Maintenance**

- 1) Maintain irrigation system for a duration of 30 calendar days from written acceptance by the City's Project Manager. Make periodic examinations and adjustments to irrigation system components in order to achieve the most efficient and uniform application of water.

#### **9.14 Cleanup**

- 1) Remove all machinery, tools, excess materials, and rubbish from site upon completion of work.

## SPECIAL PROVISIONS

### SECTION C – Measurement and Payment

#### P21108 –City Hall Plaza Renovation

##### C1. General

Measurement and payment will be on a unit price basis in accordance with the prices set forth in the bid submittal for individual work items. Where work is required but does not appear as a separate item in the bid, the cost for that work shall be included and absorbed in the unit prices named in the bid. CONTRACTOR shall make a careful assessment when preparing the bid.

##### Construction

##### Bid Item No.

##### Description

- 0060 Mobilization: Payment for Mobilization is on a Lump Sum (L.S.) basis. See Section 201 of the City of Springfield Standard Construction Specifications.
- 0061 Temporary Traffic Control: Payment for temporary traffic control, maintenance and protection including all coordination, materials, labor and equipment, as required, will be on a Lump Sum (L.S.) basis, complete. Refer to Section 202 of the Standard Specifications and to Special Provisions, Section B of these Special Provisions and Additional Technical Specifications.
- 0063 Clearing and Grubbing: Payment for Clearing and Grubbing including all cutting, removal, transport and disposal of trees of less than 1 foot diameter, stumps, tree limbs, plants, shrubs, vines, planters shall be on a Lump Sum (L.S.) basis, complete. Refer to Section 203 of the Standard Specifications.
1000. Demolition: Payment for demolition including all coordination, materials, labor and equipment, as required to remove, transport and properly dispose of equipment and materials in the existing conditions identified for removal. Payment will be on a Lump Sum (L.S.) basis, complete. Refer to Special Provisions, Section B1.6 of the Special Provisions.
- 2000 3,500 PSI Non-colored Concrete Pavement: This item is to be used for plaza surfaces, sidewalks and miscellaneous non-colored concrete paving including all fill, base rock, incidentals and appurtenances. See attached drawings and Special Provisions, Section B. Measurement and payment is by the Square Foot (S.F.).
- 3000  
and  
3001 3,500 PSI Colored Concrete Pavement; Colors #1 and #2: This item is to be used for Plaza surfaces, sidewalks and miscellaneous concrete paving with integral coloring including all fill, base rock, incidentals and appurtenances. See attached drawings and Special Provisions, Section B. Measurement and payment is by the Square Foot (S.F.).
- 4000 Permeable Concrete Pavement: This item is to be used for sidewalks and miscellaneous concrete permeable paving including all fill, base rock, incidentals and appurtenances. See attached drawings and Special Provisions, Section B. Measurement and payment is by the Square Foot (S.F.).

- 5000 Rubber Tiles: This item is to be used for Rubber Safety Surfacing used on top of concrete paving around the Centennial Fountain on the Plaza including all adhesives, incidentals and appurtenances. See attached drawings and Special Provisions, Section B. Measurement and payment is by the Square Foot (S.F.).
- 6000 Composite Decks: This item is to be used for the deck areas on the north and east sides of the Plaza and includes all footings, fill, framing, decking, incidentals and appurtenances. Refer to attached drawings and Special Provisions, Section B. Measurement and payment is shall be on a Lump Sum (L.S.) basis, complete in place.
- 7000 Irrigation: This item is to be used for the design, labor, materials, supplies, equipment, tools, and all operations in connection with installation of the drip irrigation system, piping, conduits including all incidentals and appurtenances. Refer to attached drawings and Special Provisions, Section B. Measurement and payment is shall be on a Lump Sum (L.S.) basis, complete in place.