

PROJECT MANUAL

For the Construction of:

Site and Landscape Improvements
Idaho Falls 21, 24, 32 Wards
Idaho Falls, Idaho

THE CHURCH OF
JESUS CHRIST
OF LATTER-DAY SAINTS

July 2019



ARCHITECTURE / PLANNING / INTERIORS

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INTRODUCTORY INFORMATION

Project Manual

for

**Site and Landscape Improvements
Idaho Falls 21, 24, 32 Wards
Idaho Falls, Idaho**

Church Property No. 504-7404
Architect's Project No. 19003

July 2019

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PROCUREMENT REQUIREMENTS

INVITATION TO BID (U.S.)

1. GENERAL CONTRACTORS INVITED TO BID THE PROJECT:

To be determined

2. PROJECT:

Idaho Falls 21, 24, 32 Wards
Idaho Falls Idaho Stake
Idaho Falls, Idaho
Site and Landscape Improvements

3. LOCATION:

1155 1st Street
Idaho Falls, Idaho 83401

4. OWNER:

Corporation of the Presiding Bishop of
The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole
c/o
Idaho Falls FM Group
750 West Elva
Idaho Falls, Idaho 83402

5. CONSULTANT:

NBW Architects, P.A.
990 John Adams Parkway
P.O. Box 2212
Idaho Falls, Idaho 83403

6. DESCRIPTION OF PROJECT:

- A. Replace selected landscaping and irrigation systems.
- B. Products or systems may be provided under a Value Managed Relationship (VMR) the Owner has negotiated with the supplier. VMR products and systems are indicated as such in the Specifications.

7. TYPE OF BID: Bids will be on a lump-sum basis. Segregated bids will not be accepted.

8. TIME OF SUBSTANTIAL COMPLETION: The time limit for substantial completion of this work will be 45 calendar days and will be as noted in the Agreement.

9. BID OPENING: Sealed bids will be received at a time and place to be announced. Bids will be publicly opened at a time and place to be announced.

10. BIDDING DOCUMENTS:

- A. Bidding Documents may be examined at the following plan room locations:
 - 1) McGraw Hill Construction Website: construction.com/dodge

2) Mountainlands Area Plan Room
583 W 3560 S, Suite 4
Salt Lake City, UT 84115
Phone: (801)288-9136
Fax: (801)288-1184

- B. Bidding Documents may be obtained at the Architect's office with a refundable deposit of \$25 per set. Deposit will be refunded if documents are returned complete and in good condition within five days of bid opening.
11. **BID BOND:** Bid security in the amount of 5 percent (5%) of the bid will accompany each bid in accordance with the Instruction to Bidders.
12. **BIDDER'S QUALIFICATIONS:** Bidding by the General Contractors will be by invitation only.
13. **OWNER'S RIGHT TO REJECT BIDS:** The Owner reserves the right to reject any or all bids and to waive any irregularity therein.

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS (U.S.)

1. DEFINITIONS:

- A. The definitions set forth in Section 1 of the General Conditions are applicable to the documents included under Bidding Requirements.
- B. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The proposed Contract Documents consist of the documents identified as Contract Documents in the Form of Agreement, except for Modifications. The Bidding Requirements are those documents identified as such in the proposed Project Manual.
- C. Addenda are written or graphic documents issued by the Architect prior to execution of the Contract which modify or interpret the Bidding Documents. They become part of the Contract Documents as noted in the Form of Agreement upon execution of the Contract.

2. BIDDER'S REPRESENTATIONS:

- A. By submitting a bid, the bidder represents that
 - 1) Bidder has carefully studied and compared the Bidding Documents with each other. Bidder understands the Bidding Documents and the bid is fully in accordance with the requirements of those documents,
 - 2) Bidder has thoroughly examined the site and any building located thereon, has become familiar with local conditions which might directly or indirectly affect the contract work, and has correlated its personal observations with the requirements of the proposed Contract Documents, and
 - 3) Bid is based on the materials, equipment, and systems required by the Bidding Documents without exception.

3. BIDDING DOCUMENTS:

- A. Copies
 - 1) Bidding Documents may be obtained as set forth in the Invitation to Bid.
 - 2) Partial sets of Bidding Documents will not be issued.
 - 3) Bidders will use complete sets of Bidding Documents in preparing bids and make certain that those submitting sub-bids to them have access to all portions of the documents that pertain to the work covered by sub-bid, including General Conditions, Supplementary Conditions, and Division 01. Bidder assumes full responsibility for errors or misinterpretations resulting from use of partial sets of Bidding Documents by itself or any sub-bidder.
- B. Interpretation or Correction of Bidding Documents
 - 1) Bidders will request interpretation or correction of any apparent errors, discrepancies and omissions in the Bidding Documents.
 - 2) Corrections or changes to Bidding Documents will be made by written addenda.
- C. Substitutions and Equal Products
 - 1) Generally speaking, substitutions for specified products and systems, as defined in the Uniform Commercial Code, are not acceptable. However, equal products may be approved upon compliance with Contract Document requirements.
 - 2) The terms '*Acceptable Manufacturers*', '*Approved Manufacturers*', '*Suppliers*', '*Installers*' and '*VMR (Value Managed Relationship) Manufacturers / Suppliers / Installers*' are used throughout the Project Manual to differentiate among the options available to Contractor regarding specified products, manufacturers, and suppliers. See Section 016000 for options available regarding acceptance of equal products.
 - 3) Base bid only on materials, equipment, systems, suppliers or performance qualities specified in the Bidding Documents.

- 4) Architect is only authorized to consider requests for approval of equal products to replace specified products in Sections where the heading 'Acceptable Manufacturers' is used and statement, 'Equal as approved by Architect before bidding. See Section 016000' or 'Equal as approved by Architect before installation. See Section 016000,' appears. In Sections where the afore-mentioned statements do not appear and a different heading is used, Architect is authorized as Owner's representative to decline consideration of requests for approval of equal products. Approvals of equal products in such Sections must be made by Owner and will generally be for subsequent Projects.
- D. Addenda - Addenda will be sent to bidders and to locations where Bidding Documents are on file no later than one week prior to bid opening or by fax no later than 48 hours prior to bid opening.

4. BIDDING PROCEDURES:

- A. Form and Style of Bids
 - 1) Use Owner's Bid Form.
 - 2) Fill in all blanks on Bid Form. Signatures will be in longhand and executed by representative of bidder duly authorized to make contracts.
 - 3) Bids will bear no information other than that requested on bid form. Do not delete from or add to the information requested on the bid form.
- B. Bid Security
 - 1) Each bid will be accompanied by a bid bond naming Owner, as listed in the Agreement, as obligee. If Bidder refuses to enter into a Contract or fails to provide bonds and insurance required by the General Conditions, amount of bid security will be forfeited to Owner as liquidated damages, not as a penalty.
 - 2) Bid bond will be issued by a surety company meeting requirements of the General Conditions for surety companies providing bonds and will be submitted on AIA Document A310, Bid Bond or AIA authorized equivalent provided by surety company. The attorney-in-fact who executes the bond on behalf of the surety will affix to the bond a certified and current copy of the power of attorney.
 - 3) Owner may retain bid security of bidders to whom an award is being considered until -
 - a. Contract has been executed and bonds have been furnished,
 - b. Specified time has elapsed so bids may be withdrawn, or
 - c. All bids have been rejected.
- C. Submission of Bids
 - 1) Submit bid in sealed opaque envelope containing only bid form and bid security. Envelopes will be sealed, bear bidder's name, and include the following:

BID FOR
_____ (Project Name) _____
_____ (number) _____

If bid is sent by mail, enclose sealed envelope in separate mailing envelope with notation 'SEALED BID ENCLOSED' on face.
 - 2) It is bidder's sole responsibility to see that its bid is received at specified time. Bids received after specified bid opening time will be returned to bidders unopened.
 - 3) No oral, facsimile transmitted, telegraphic, or telephonic bids, modifications, or cancellations will be considered.
- D. Modification or Withdrawal of Bid
 - 1) Bidder guarantees there will be no revisions or withdrawal of bid amount for 45 days after bid opening.
 - 2) Prior to bid opening, bidders may withdraw bid by written request or by reclaiming bid envelope.
 - 3) Prior to bid opening, bidder may mark and sign on the sealed envelope that bidder

acknowledges any or all Addenda.

5. CONSIDERATION OF BIDS:

- A. Opening of Bids - See Invitation to Bid.
- B. Rejection of Bids - Owner reserves right to reject any or all bids and to waive any irregularity therein.
- C. Acceptance of Bid
 - 1) No bidder will consider itself under contract after opening and reading of bids until Agreement between Owner and Contractor is fully executed.
 - 2) Bidder's past performance, organization, subcontractor selection, equipment, and ability to perform and complete its contract in manner and within time specified, together with amount of bid, will be elements considered in award of contract.

6. POST-BID INFORMATION:

- A. The conditionally accepted bidder submitting a bid involving subcontractors will submit its list of proposed subcontractors in a meeting to be held immediately after bid opening.

7. PERFORMANCE BOND AND PAYMENT BOND:

- A. Bond Requirements - Performance Bond and Labor and Material Payment bond will be required for this Project as specified in the General Conditions.
- B. Time of Delivery of Bonds - Bonds will be delivered to Owner with Agreement signed by bidder.

8. FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

- A. Agreement form will be "Agreement Between Owner and Contractor for a Fixed Sum (U.S.)" provided by Owner.

9. MISCELLANEOUS:

- A. Pre-Bid Conference
 - 1) A pre-bid conference will be held at a time and place to be announced.
- B. Liquidated Damages - Conditions governing liquidated damages are specified in the General Conditions and in the Supplementary Conditions.
- C. Examination Schedule for Existing Building and Site
 - 1) Site may be examined following the Pre-Bid Conference.
- D. Exemption from local taxes - See Supplementary Conditions

END OF DOCUMENT

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SUBCONTRACTORS AND MAJOR MATERIALS SUPPLIERS LIST

Project Name: _____ Date: _____

Stake: _____ Project No: _____

General Contractor: _____

General Contractor is to provide the names of the following subcontractors and suppliers to the Owner's Project Manager immediately following the bid opening:

SUBCONTRACTORS AND SUPPLIERS

Grading / Site work _____

Site Concrete _____

Irrigation System _____

Landscaping _____

EQUAL PRODUCT APPROVAL REQUEST FORM (U.S.)

Project Name: _____ Request Number: _____

TO: _____

FROM: _____

BID DATE: _____

A proposed product is not legally approved and cannot legally be included in a bid or used in the Work until it appears in an Addendum or other Contract Modification as defined in the General Conditions. See Instructions To Bidders Paragraph 3.C, General Conditions, and Section 016000.

PROPOSED EQUAL PRODUCT:

Specification Section: _____

Specified Products: _____

Proposed Product: _____

The Undersigned certifies:

1. Proposed equal product has been fully investigated and determined to be equal or superior in all respects to specified products.
2. Same warranty will be furnished for proposed equal product as for specified products.
3. Same maintenance service and source of replacement parts, as applicable, is available.
4. Proposed equal product will have no adverse effect on other trades and will not affect or delay progress schedule.
5. Proposed equal product does not affect dimensions and functional clearances.

ATTACHMENTS:

Include the following attachments -

1. Copy of the Project Manual Section where the proposed equal product would be specified, rewritten or red-lined to include any changes necessary to correctly specify the proposed equal product. Identify completely changes necessary to the original Project Manual Section.
2. Copies of details, elevations, cross-sections, and other elements of the Project Drawings redone as necessary to show changes necessary to accommodate proposed equal product. Identify completely the changes from the original Drawings.
3. Complete product literature and technical data, installation and maintenance instructions, test results, and other information required to show complete conformance with requirements of the Contract Documents.

SIGNED: _____

Printed Name _____

Company _____

Address _____

City, State, Zip Code _____

Telephone _____ Fax _____

REVIEW COMMENTS:

_____ Accepted. See Addenda Number _____.

_____ Submission not in compliance with instructions. Respond to attached comments and resubmit.

_____ Proposed equal product not acceptable. Use specified products.

_____ Not Reviewed. Submission received too late. Use specified products.

ADDITIONAL COMMENTS:

BY: _____ **DATE:** _____

BID FORM

FOR GENERAL CONTRACT WORK (U.S.)

PROJECT IDENTIFICATION:

Idaho Falls 21, 24, 32 Site and Landscape Improvements

OWNER:

Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter-day Saints, a Utah corporation
sole ("Owner") Idaho Falls FM Group

ARCHITECT:

NBW Architects, P.A.

BID

1. In submitting this Bid, Bidder represents that:
 - a. If this Bid is accepted, Bidder will enter into an agreement with Owner to perform and furnish the Work described in the Bidding Documents for the Bid Price and within the Time of Substantial Completion indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
 - b. Bidder has carefully examined Set(s) Number _____ of the Bidding Documents consisting of the Project Manual containing the Bidding Requirements, the Conditions of the Contract, and the Specifications, entitled _____, the Drawings entitled _____ and dated _____, and including sheets numbered _____, and addenda numbers _____.
 - c. Bidder has examined the site of the work, existing conditions, and all other conditions affecting the work on the above-named Project.
 - d. Bidder has carefully correlated the information known to Bidder and information and observations obtained from visits to the site with the Bidding Documents.
 - e. Bidder is familiar with federal, State, and local laws and regulations applicable to Project.
 - f. Bidder guarantees there will be no revisions or withdrawal of bid amount for forty-five (45) days after the bid opening.
2. **Base Bid:** Bidder hereby proposes to furnish all materials, labor, equipment, tools, transportations, services, licenses, fees, permits, etc., required by said documents to complete the Work described by the Contract Documents for the lump-sum of: _____ Dollars (\$ _____).
- Add Alternate No. 1 Bid:** Bidder hereby proposes to furnish all materials, labor, equipment, tools, transportations, services, licenses, fees, permits, etc., required by said documents to complete the Work described by the Contract Documents for the lump-sum of: _____ Dollars (\$ _____).
3. Bidder agrees to achieve substantial completion of the Work within the number of days indicated in the Invitation to Bid.
4. Enclosed is a Bid Bond for not less than five percent (5%) of the bid.

RESPECTFULLY SUBMITTED:

_____	Signature	
_____	Printed name	
_____	Title	
_____	Company name	
_____	Business Address	
_____	City, State, and Zip Code	
_____	Telephone	Fax
_____	Contact Email Address	

_____ Date

_____ License No.

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CONTRACTING REQUIREMENTS

SMALL PROJECT AGREEMENT BETWEEN OWNER AND CONTRACTOR Fixed Sum (U.S.)

The Church of Jesus Christ of Latter-day Saints, a Utah corporation sole ("Owner") and _____ ("Contractor") enter into this *Small Project Agreement Between Owner and Contractor (U.S.)* ("Agreement") and agree as follows:

1. **Property/Project.**

Property/Project Number: _____
Property Address ("Project Site"): _____
Project Type: _____
Project Name ("Project"): _____
Stake Name: _____

2. **Scope of Work.** Contractor will furnish all labor, materials, tools, and equipment necessary to complete the Work in accordance with the Contract Documents. The Work is all labor, materials, tools, equipment, construction, and services required by the Contract Documents (the "Work").

3. **Contract Documents.** Contract Documents consist of:

- a. This Agreement;
- b. Supplementary Conditions for Small Project Agreement Between Owner and Contractor (U.S.);
- c. The Specifications (Division 01 and Divisions _____);
- d. Drawings entitled and dated _____;
- e. Addendum No. with date(s) _____;
- g. All written Field Changes, written Construction Change Directives and written Change Orders when prepared and signed by Owner and Contractor.

4. **Compensation.** Owner will pay Contractor for performance of Contractor's obligations under the Contract Documents the sum of _____ Dollars (\$_____) (the "Contract Sum"). This Contract Sum includes all labor, materials, equipment, tools, costs, expenses, work and services of Contractor and its subcontractors necessary to perform the Work in accordance with the terms of this Agreement, including without limitation travel, communications, and copying costs.

5. **Payment.**

- a. If the Contract Sum is over \$100,000 or if otherwise requested by Owner, Contractor will submit to Owner a schedule of values which allocates the Contractor's Bid Proposal Amount to various portions of the Work. This schedule, when accepted by Owner will be used as a basis for reviewing Contractor's payment requests.
- b. Not more than once each month, Contractor will submit a payment request to Owner. Owner will pay Contractor for work completed within thirty (30) days after Owner receives:
 - 1) Contractor's payment request for work to date;
 - 2) a certification by Contractor that Contractor has paid for all labor, materials, and equipment relating to the Work covered by prior payment requests and that Contractor will pay for all labor, materials, and equipment relating to the Work covered by the current payment request; and
 - 3) releases of all mechanics' liens and claims of subcontractors, laborers, or material suppliers who supplied labor and/or materials for the Work covered by the payment request.
- 4) updated Construction Schedule.
- c. Owner may modify or reject the payment request if, in Owner's opinion, the Work for which payment is requested is not acceptable or is less complete than represented on the payment request.
- d. Contractor will timely pay subcontractors their portion of fees and expenses that Owner has paid to Contractor.

6. **Extras and Change Orders.** Owner may order changes in the Work by altering, adding to, or deducting from the Work. In the event of such a change, the Contract Sum and/or the time of completion will be adjusted to reflect the change by means of a written Change Order signed by Contractor and Owner. Contractor will not commence work on any change until either: (a) Contractor and Owner have executed a Change Order; or (b) Owner has issued a written order for the change acknowledging that there is a dispute regarding the compensation adjustment relating to the change. If Contractor proceeds with a change in the Work without complying with the preceding sentence, Contractor agrees that it will not be entitled to any additional compensation for such change.
7. **Warranty and Correction of Work.** For all Work, services, labor, materials, products, and equipment provided under the Contract Documents, Contractor provides and extends to Owner all statutory, common law, and standard industry warranties as well as those warranties set forth in Owner's Contract Documents. Unless a longer period is specified by Owner's Contract Documents or otherwise, Contractor, at a minimum and in addition to all other warranties, warrants all Work under the Contract Documents for at least one year. Specifically, and without limitation, Contractor will promptly correct at its own expense:
 - a. any portion of the Work which
 - 1) fails to conform to the requirements of the Contract Documents, or
 - 2) is rejected by the Owner as defective or because it is damaged or rendered unsuitable during installation or resulting from failure to exercise proper protection.
 - b. any defects due to faulty materials, equipment, or workmanship which appear within a period of one year from the date of completion of the Work or within such longer period of time as may be prescribed by law or the terms of any applicable special warranty required by the Contract Documents.
8. **Time of Completion.** Contractor will complete the Work and have it ready for Owner's inspection within _____ (_____) calendar days from Notice to Proceed issued by Owner. Time is of the essence. If Contractor is delayed at any time in the progress of the Work by any act or neglect of Owner, or by changes in the Work, or by strikes, lockouts, unusual delay in transportation, unavoidable casualties, or acts of nature beyond Contractor's control, then the time for completion will be extended by the time that completion of the Work is delayed. However, Contractor expressly waives any damages for any such delays.
9. **Owner Provided Items.** Owner may provide furnishings, equipment, and/or other items for the Project. Contractor will install items furnished by Owner and/or receive, store, and protect such items on site until the date Owner accepts the Project.
10. **Product Requirements.** Contractor will provide products that comply with Contract Documents, are undamaged, and, unless otherwise indicated, are new and unused at time of installation. Contractor will provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and for intended use and effect.
11. **Permits, Surveys, and Taxes.** Contractor will obtain and pay for all permits and licenses, and also pay any applicable taxes. Contractor will also obtain and pay for any surveys it needs to perform the Work.
12. **Independent Contractor Relationship.** Contractor is not an agent or employee of Owner but is an independent contractor.
13. **Comply with Laws.** Contractor will comply, and ensure that all subcontractors comply, with all applicable laws, ordinances, rules, regulations, covenants, and restrictions.
14. **Indemnity and Hold Harmless.**
 - a. Contractor will indemnify and hold harmless Owner and Owner's representatives, employees, agents, architects, and consultants from and against any and all claims, liens, damages, liability, demands, costs, judgments, awards, settlements, causes of action, losses and expenses (collectively "Claims" or "Claim"), including but not limited to attorney fees, consultant fees, expert fees, copy costs, and other expenses, arising out of or resulting from performance of or failure to perform the Work, attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property, including loss of use resulting therefrom, except to the extent that such liability arises out of the negligence of Owner, its

representatives, agents, and employees. This indemnity includes, without limitation, indemnification of Owner from all losses or injury to Owner's property, except to the extent that such loss or injury arises out of the negligence of Owner, its representatives, agents, and employees. This indemnity applies, without limitation, to include Claims occurring both during performance of the Work and/or subsequent to completion of the Work. In the event that any Claim is caused in part by a party indemnified hereunder, that party will bear the cost of such Claim to the extent it was the cause thereof. In the event that a claimant asserts a Claim for recovery against any party indemnified hereunder, the party indemnified hereunder may tender the defense of such Claim to Contractor. If Contractor rejects such tender of defense and it is later determined that the negligence of the party indemnified hereunder did not cause all of the Claim, Contractor will reimburse the party indemnified hereunder for all costs and expenses incurred by that party in defending against the Claim. Contractor will not be liable hereunder to indemnify any party for damages resulting from the sole negligence of that party.

- b. In addition to the foregoing, Contractor will be liable to defend Owner in any lawsuit filed by any Subcontractor relating to the Project. Where liens have been filed against Owner's property, Contractor (and/or its bonding company which has issued bonds for the Project) will obtain lien releases and record them in the appropriate county and/or local jurisdiction and provide Owner with a title free and clear from any liens of Subcontractors. In the event that Contractor and/or its bonding company are unable to obtain a lien release, Owner in its absolute discretion may require Contractor to provide a bond around the lien or a bond to discharge the lien, at Contractor's sole expense.
- c. In addition to the foregoing, Contractor will indemnify and hold Owner harmless from any claim of any other contractor resulting from the performance, nonperformance or delay in performance of the Work by Contractor.
- d. The indemnification obligation herein will not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or a Subcontractor under workers compensation acts, disability benefit acts, or other employee benefit acts.

15. **Work Restrictions.** Contractor will ensure that Contractor, its agents, employees, and subcontractors:

- a. Do not use or consume alcohol or cannabis, or illegally use drugs, on the Project Site or enter on or perform any Work on the Project Site while under their influence.
- b. Do not smoke or vape anything on the Project Site. Do not use tobacco in any form on the Project Site.
- c. Do not perform Work on the Project Site on Sundays except for emergency work.
- d. Refrain from using profanity or being discourteous or uncivil to others on the Project Site or while performing Work under this Agreement.
- e. Do not view or allow pornographic or other indecent materials on the Project Site.
- f. Do not play obnoxious and/or loud music on the Project Site. Do not play any music within existing facilities.
- g. Refrain from wearing immodest, offensive, or obnoxious clothing, while on the Project Site.
- h. Do not bring weapons on the Project Site.

16. **Safety Hazards.** Contractor will ensure that no work or services will be performed that may pose an undue safety hazard to Contractor, Contractor's employees, or any other person.

17. **Contractor's Insurance.** Prior to performing any work, Contractor will obtain and maintain during the term of this Agreement the following insurance:

- a. Workers Compensation Insurance or evidence of exemption.
- b. Employers Liability Insurance with minimum limits of the greater of \$500,000 E.L. each accident, \$500,000 E. L. disease-each employee, \$500,000 E.L. disease-policy limit or as required by the law of the state in which the Project is located.
- c. Commercial General Liability Insurance – ISO Form CG 00 01 (12/07) or equivalent Occurrence policy which will provide primary coverage to the additional insureds (the Owner and the Architect) in the event of any Occurrence, Claim, or Suit with:
 - 1) Limits of the greater of: Contractor's actual coverage amounts or the following:
 - a) \$2,000,000 General Aggregate;
 - b) \$2,000,000 Products - Comp/Ops Aggregate;
 - c) \$1,000,000 Personal and Advertising Liability;
 - d) \$1,000,000 Each Occurrence; and

- e) \$50,000 Fire Damage to Rented Premises (Each Occurrence)
- 2) Endorsements attached to the General Liability policy including the following or their equivalent:
 - a) ISO Form CG-25-03 (05/09), Amendment of Limits of Insurance (Designated Project or Premises) describing the Agreement and specifying limits as shown above.
 - b) ISO Form CG 20 10 (07/04), Additional Insured – Owners, Lessees, Or Contractors (Form B), naming Owner and Architect as additional insureds.
- d. Automobile Liability Insurance, with:
 - 1) Combined Single Limit each accident in the amount of no less than \$500,000; and
 - 2) Coverage applying to "Any Auto" or its equivalent.

Contractor will provide evidence of these insurance coverages to Owner by providing an ACORD 25 (2010/05) Form or its equivalent: (1) listing Owner as the Certificate Holder and Additional Insured on the general liability and any excess liability policies, (2) listing the insurance companies providing coverage (all companies listed must be rated in A.M. Best Company Key Rating Guide-Property-Casualty and each company must have a rating of B+ Class VII or higher), (3) attaching the endorsements set forth above for the Certificate of Liability Insurance, and (4) bearing the name, address and telephone number of the producer and signed by an authorized representative of the producer. (The signature may be original, stamped, or electronic.) Notwithstanding the foregoing, Owner may, in writing and at its sole discretion, modify these insurance requirements.

18. **Resolution of Disputes.** In the event there is any dispute arising under the Contract Documents which cannot be resolved by agreement between the parties, either party may submit the dispute with all documentation upon which it relies to Director of Architecture, Engineering, and Construction, 50 East North Temple, Salt Lake City, Utah 84150, who will convene a dispute resolution conference within thirty (30) days. The dispute resolution conference will constitute settlement negotiations and any settlement proposal made pursuant to the conference will not be admissible as evidence of liability. In the event that the parties do not resolve their dispute pursuant to the dispute resolution conference, either party may commence legal action to resolve the dispute. Any such action must be commenced within six (6) months from the first day of the dispute resolution conference or be time barred. Submission of the dispute to the Director as outlined above is a condition precedent to the right to commence legal action to resolve any dispute. In the event that either party commences legal action to adjudicate any dispute without first submitting the dispute to the Director, the other party will be entitled to obtain an order dismissing the litigation without prejudice and awarding such other party any costs and attorney fees incurred by that party in obtaining the dismissal, including without limitation copy costs, and expert and consultant fees and expenses. Pending final resolution of a dispute hereunder, Contractor will proceed diligently with the performance of its obligations pursuant to this Agreement.
19. **Termination by Contractor.** In the event Owner materially breaches any term of the Contract Documents, Contractor will promptly give Written Notice of the breach to Owner. If Owner fails to cure the breach within ten (10) days of the Written Notice, Contractor may terminate this Agreement by giving Written Notice to Owner and recover from Owner the percentage of the Contract Sum represented by the Work completed on the Project site as of the date of termination together with any out of pocket loss Contractor has sustained with respect to materials and equipment as a result of the termination prior to completion of the Work, less any offsets. Contractor will not be entitled to unearned profits or any other compensation or damages as a result of the termination and hereby waives any claim therefor. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.
20. **Termination by Owner for Cause.** Should Contractor fail to timely provide Owner with the certificates of insurance, make a general assignment for the benefit of its creditors, fail to apply enough properly skilled workmen or specified materials to properly prosecute the Work in accordance with Contractor's schedule, or otherwise materially breach any provision of the Contract Documents, then Owner may, without any prejudice to any other right or remedy, give Contractor Written Notice thereof. If Contractor fails to cure its default within ten (10) days, Owner may terminate this Agreement by giving Written Notice to Contractor. In such case, Owner may, in Owner's sole discretion, take legal assignment of subcontracts and other contractual

rights of Contractor and/or take possession of the premises and all materials, tools, equipment, and appliances thereon, and finish the Work by whatever method Owner deems expedient. Contractor will not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Sum exceeds the expense of finishing the Work, including compensation for additional administrative, architectural, consultant, and legal services (including without limitation attorney fees, expert fees, copy costs, and other expenses), such excess will be paid to Contractor, less any offsets. If such expense exceeds the unpaid balance, Contractor will pay the difference to Owner. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.

21. **Termination by Owner for Convenience.** Notwithstanding any other provision contained in the Contract Documents, Owner may, without cause and in its absolute discretion, terminate this Agreement at any time. In the event of such termination, Contractor will be entitled to recover from Owner the percentage of the Contract Sum equal to the percentage of the Work which Owner and/or its architect determines has been completed on the Project site as of the date of termination together with any out of pocket loss Contractor has sustained with respect to materials and equipment as a result of the termination prior to completion of the Work, less any offsets. Contractor will not be entitled to unearned profits or any other compensation as a result of the termination and hereby waives any claim therefor. Contractor will provide to Owner all warranty, as built, inspection, and other close out documents as well as materials that Contractor has in its possession or control at the time of termination. Owner may, in Owner's sole discretion, take legal assignment of subcontracts and other contractual rights of Contractor. Without limitation, Contractor's indemnities and obligations as well as all warranties relative to Work provided through the date of termination survive a termination hereunder.
22. **Enforcement.** In the event either party commences legal action to enforce or rescind any term of this Agreement, the prevailing party will be entitled to recover its attorney fees, costs and legal expenses, including without limitation all copy costs and expert and consultant fees and expenses, incurred in that action and on all appeals, from the other party.
23. **Ownership of Materials, Products, and Intellectual Property Rights.** Owner will retain ownership and intellectual property rights in all plans, designs, drawings, documents, concepts, and materials provided by or on behalf of Owner to Contractor and to all work products of Contractor and its subcontractors for products, services, and Work provided under this Agreement, such products, services, and Work of Contractor and its subcontractors constituting works made for hire. Neither Contractor nor its subcontractors will reuse any portion of such items provided by Owner or work products developed by Contractor or its subcontractors for Owner pursuant to this Agreement or disclose any such items to any third party without the prior written consent of Owner. Owner may withhold its consent in its absolute discretion. Contractor shall obtain the written agreement of each of its subcontractors to the terms of this section prior to permitting the subcontractor to perform any services contemplated by this Agreement.
24. **Comply with Intellectual Property Rights of Others.** Contractor represents and warrants that no Work or services (with its means, methods, goods, and services attendant thereto), provided to Owner will infringe or violate any right of any third party and that Owner may use and exploit such Work, means, methods, goods, and services without liability or obligation to any person or entity (specifically and without limitation, such Work, means, methods, goods, and services will not violate rights under any patent, copyright, trademark, or other intellectual property right or application for the same).
25. **Ownership and Use of Renderings and Photographs.** Renderings, photographs, and/or other images of or representing the services, Work, or any improvement on or relative to the Project Site, whether created before, during, or at completion of construction (and whether created by Owner, Contractor, or Contractor's subcontractors), are the property of the Owner. Contractor hereby transfers and assigns to Owner all ownership and intellectual property rights that Contractor and/or its subcontractors may have in and to all such renderings, photographs, and other images. The Owner reserves all rights including copyrights and other intellectual property rights to such renderings, photographs, and other images. No such renderings, photographs, or other images shall be used or distributed without written consent of the Owner.

26. **Public Statements.** Contractor will not make any statements or provide any information to the media about the Project or Work without the prior written consent of Owner. If Contractor receives any requests for information from media, Contractor will refer such requests to Owner.
27. **Confidentiality.** Contractor shall ensure that Contractor and its subcontractors, and the employees, agents and representatives of Contractor and its subcontractors, maintain in strict confidence, and shall use and disclose only as authorized by Owner all Confidential Information of Owner that Contractor receives in connection with the performance of this Agreement. Notwithstanding the foregoing, Contractor may use and disclose any information to the extent required by an order of any court or governmental authority, but only after it has notified Owner and Owner has had an opportunity to obtain reasonable protection for such information in connection with such disclosure. For purposes of this Agreement, "Confidential Information" means:
- a. The name or address of any affiliate, customer or contractor of Owner or any information concerning the transactions of any such person with Owner;
 - b. Any contracts, agreements, business plans, budgets or other financial information, renderings, photographs, and materials provided by Owner, relating to the Work or any improvement on the Project Site to the extent such has not been made available to the public by the Owner;
 - c. Any other information that is marked or noted as confidential at the time of its disclosure.
28. **No Commercial Use of Transaction or Relationship.** Without the prior written consent of Owner, which Owner may grant or withhold in its sole discretion, neither Contractor nor Contractor's affiliates, officers, directors, agents, representatives, shareholders, members, Subcontractors, or employees shall make any private commercial use of their relationship to Owner or the Project, including, without limitation:
- a. By referring to the Owner or Project verbally or in any sales, marketing or other literature, letters, client lists, press releases, brochures or other written materials except as may be necessary for Contractor to perform Contractor's obligations under the terms of this Agreement;
 - b. By using or allowing the use of any photographs of the Work or Project or any part thereof, or of any service marks, trademarks or trade names or other intellectual property now or which may hereafter be associated with, owned by or licensed by Owner, in connection with any work, service or product; or
 - c. By contracting with or receiving money or anything of value from any person or commercial entity to facilitate such person or entity obtaining any type of commercial identification, advertising or visibility in connection with the Owner or Project.
- Notwithstanding the foregoing, Contractor may include a reference to Owner or the Project in a professional résumé or other similar listing of Contractor's references without seeking Owner's written consent in each instance, provided that such reference to Owner or the Project is included with at least several other similar references to projects of different owners and is given no more prominence than such other references.
29. **Entire Agreement.** This Agreement contains the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, relating to the Project. This Agreement may be amended only by a writing signed by both parties. This Agreement will not be construed to create a contractual relationship of any kind between any persons or entities other than Owner and Contractor.
30. **Assignment.** Contractor will not assign any right or obligation hereunder without the prior written consent of the Owner, which consent may be granted or withheld in Owner's absolute discretion.
31. **Governing Law.** The parties acknowledge that the Contract Documents have substantial connections to the State of Utah. The Contract Documents will be deemed to have been made, executed, and delivered in Salt Lake City, Utah. To the maximum extent permitted by law, (i) the Contract Documents and all matters related to their creation and performance will be governed by and enforced in accordance with the laws of the State of Utah, excluding conflicts of law rules, and (ii) all disputes arising from or related to the Contract Documents will be decided only in a state or federal court located in Salt Lake City, Utah and not in any other court or state. Toward that end, the parties hereby consent to the jurisdiction of the state and federal courts located in Salt Lake City, Utah and waive any other *venue* to which they might be entitled by virtue of domicile, habitual residence, place of business, or otherwise.

32. **Effective Date.** The effective date of this Agreement is the date indicated by Owner's signature.

OWNER:

The Church of Jesus Christ of Latter-day Saints,
a Utah corporation sole

CONTRACTOR:

(company)

Signature:

Signature:

Print Name:

Print Name:

Title:

Title:

Address:

Address:

Telephone No:

Telephone No:

Facsimile No:

Facsimile No:

Email:

Email:

Effective Date:

Fed. I.D. or SSN:

License No:

Reviewed By:

Date Signed:

SUPPLEMENTARY CONDITIONS

FOR SMALL PROJECT AGREEMENT BETWEEN OWNER AND CONTRACTOR (U.S.)

ITEM 1 - GENERAL

1. Conditions of the Small Project Agreement Between Owner and Contractor (U.S.) apply to each Division of the Specifications.
2. Provisions contained in Division 01 apply to all Divisions of the Specifications.

END OF DOCUMENT

SPECIFICATIONS

DIVISION 01: GENERAL REQUIREMENTS

01 1000 SUMMARY

01 1100 SUMMARY OF WORK
01 1400 WORK RESTRICTIONS

01 2000 PRICE AND PAYMENT PROCEDURES

01 2300 ALTERNATES

01 3000 ADMINISTRATIVE REQUIREMENTS

01 3100 PROJECT MANAGEMENT AND COORDINATION
01 3300 SUBMITTAL PROCEDURES

01 4000 QUALITY REQUIREMENTS

01 4000 QUALITY REQUIREMENTS
01 4301 QUALITY ASSURANCE - QUALIFICATIONS

01 5000 TEMPORARY FACILITIES AND CONTROLS

01 5000 TEMPORARY FACILITIES AND CONTROLS

01 6000 PRODUCT REQUIREMENTS

01 6200 PRODUCT OPTIONS
01 6600 PRODUCT DELIVERY, STORAGE, AND HANDLING REQUIREMENTS

01 7000 EXECUTION AND CLOSEOUT REQUIREMENTS

01 7400 CLEANING AND WASTE MANAGEMENT
01 7700 CLOSEOUT PROCEDURES
01 7800 CLOSEOUT SUBMITTALS

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DIVISION 01

SECTION 01 0000

GENERAL REQUIREMENTS: R&I PROJECT

- 01 1000 SUMMARY**
- 01 1400 WORK RESTRICTIONS**
- 01 2300 ALTERNATES**
- 01 3000 ADMINISTRATIVE REQUIREMENTS**
- 01 3100 PROJECT MANAGEMENT AND COORDINATION**
- 01 3300 SUBMITTAL PROCEDURES**
- 01 4000 QUALITY REQUIREMENTS**
- 01 4301 QUALITY ASSURANCE – QUALIFICATIONS**
- 01 5000 TEMPORARY FACILITIES AND CONTROLS**
- 01 6200 PRODUCT OPTIONS**
- 01 6600 DELIVERY, STORAGE, AND HANDLING REQUIREMENTS**
- 01 7000 EXECUTION REQUIREMENTS**
- 01 7400 CLEANING AND WASTE MANAGEMENT**
- 01 7700 CLOSEOUT PROCEDURES**
- 01 7800 CLOSEOUT SUBMITTALS**

SECTION 01 1000 SUMMARY

- A. Provisions contained in Division 01 apply to all other sections and divisions of Specifications. All instructions contained in Specifications are directed to Contractor. Unless specifically provided otherwise, all obligations set forth in Specifications are obligations of Contractor.
- B. Comply with applicable laws and regulations.

SECTION 01 1400 WORK RESTRICTIONS

- A. During construction period, Contractor will have use of premises for construction operations. Contractor will ensure that Contractor, its employees, subcontractors, and employees comply with following requirements:
 - 1. Confine operations to areas within Contract limits shown on Drawings. Do not disturb portions of site beyond Contract limits.
 - 2. Do not allow alcoholic beverages, illegal drugs, or persons under their influence on Project Site.
 - 3. Do not allow use of tobacco in any form on Project Site.
 - 4. Do not allow pornographic or other indecent materials on site.
 - 5. Do not allow work on Project Site on Sundays except for emergency work.
 - 6. Refrain from using profanity or being discourteous or uncivil to others on Project Site or while performing The Work.
 - 7. Wear shirts with sleeves, wear shoes, and refrain from wearing immodest, offensive, or obnoxious clothing, while on Project Site.
 - 8. Do not allow playing of obnoxious and loud music on Project Site. Do not allow playing of any music within existing facilities.
 - 9. Do not build fires on Project Site.
 - 10. Do not allow weapons on Project Site, except those carried by law enforcement officers and/or other uniformed security personnel who have been retained by Owner or Contractor to provide security services.
- B. Existing Facilities:
 - 1. If Owner will occupy existing building, reasonably accommodate use of existing facilities by Facilities Manager or Owner Representative.

SECTION 01 2300 ALTERNATES

- A. Administrative and procedural requirements to prepare and process Alternates.

- B. With its bid, Contractor has provided prices for following alternate products, materials, equipment, systems, methods, units of work, or major elements of The Work. Any of these Alternates may, at Owner's option, be selected for The Work in place of corresponding requirements of Contract Documents
 - 1. Base Bid: Landscape Zones 6, 7, 8, 11 and 12.
 - 2. Alternate No. 1: Landscape Zones 1 thru 5, 9 and 10.
- C. Contractor acknowledges that description for each Alternate is incomplete and abbreviated, but that it implies that each Alternate will be complete for scope of work affected.
- D. Contractor will coordinate related work and modify surrounding work as required to properly integrate with work of each Alternate selected by Owner.

SECTION 01 3000 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate construction activities to ensure efficient and orderly installation of each part of The Work. Coordinate construction operations that are dependent upon each other for proper installation, connection, and operation. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

SECTION 01 3100 PROJECT MANAGEMENT AND COORDINATION

- A. Preconstruction Conference:
 - 1. Attend preconstruction conference and organizational meeting scheduled by Facilities Manager or Owner Representative at Project site or other convenient location.
 - 2. Be prepared to discuss items of significance that could affect progress, including such topics as:
 - a. Construction schedule, equipment deliveries, general inspection of tests, preparation of record documents and O&M manuals, project cleanup, security, shop drawings, samples, use of premises, work restrictions, and working hours.

SECTION 01 3300 SUBMITTAL PROCEDURES

- A. Coordination preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently before performance of related construction activities to avoid delay.
- B. Allow sufficient review time so installation will not be delayed by time required to process submittals.

SECTION 01 4000 QUALITY REQUIREMENTS

- A. Conflicting Requirements: If compliance with two or more standards is specified and standards establish different or conflicting requirements for minimum quantities or quality levels, comply with most stringent requirement.
- B. Minimum Quantity or Quality Levels: Quantity or quality level shown or specified shall be the minimum provided or performed. Actual installation may comply exactly with minimum quantity or quality specified, or it may exceed minimum within reasonable limits.
- C. Submit to Owner permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records establishing compliance with standards and regulations bearing upon performance of The Work.
- D. Repair And Protection:
 - 1. Repair and protection are Contractor's responsibility, regardless of assignment of responsibility for Quality Assurance and Quality Control Services.

SECTION 01 4301 QUALITY ASSURANCE - QUALIFICATIONS

- A. Qualifications: Qualifications in this Section establish minimum qualification levels required:
 - 1. Installer Qualifications:

- a. Firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with record of successful in-service performance.

SECTION 01 5000 TEMPORARY FACILITIES AND CONTROLS

- A. Owner will provide electric power for construction activities within limits available at existing facility.
- B. Contractor will use existing water supply for construction purposes to extent of existing facilities.
- C. Existing restroom facilities may be used by Contractor. Clean restrooms and portions of existing building used in accessing restrooms daily.
- D. Erect adequate barricades, warning signs, and lights necessary to protect persons from injury or harm.
- E. Contractor is responsible for security of materials, tools, and equipment. Do not permit others to use building keys provided by Owner. Safeguard building and contents while The Work is being performed and secure building when the Work is finished for day.
- F. Protect existing trees and plants. Remove and replace vegetation that dies or is damaged beyond repair due to construction activities.
- G. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and reduce possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result:
 1. Avoid use of tools and equipment that produce harmful noise.
 2. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near site.
 3. Protect The Work, materials, apparatus, and fixtures from injury due to weather, theft, and vandalism.

SECTION 01 6200 PRODUCT OPTIONS

- A. Product selection is governed by Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include:
 1. Substitutions And Equal Products:
 - a. Equal products may be approved upon compliance with Contract Document requirements.
 - b. Approved Products:
 - 1) Category Four:
 - (a) Provide only specified products available from manufacturers listed. No substitutions, private-labeled, or equal products, or mixing of manufacturers' products is allowed on this Project.
 - c. Acceptable Products:
 - 1) Type One: Use specified products unless approval to use other products / manufacturers has been obtained from Architect or Owner Representative by Addendum.
 - 2) Type Two: Use specified products / manufacturers unless approval to use other products and manufacturers has been obtained from Architect or Owner Representative in writing before installing or applying unlisted or private-labeled products.
 - 3) Use 'Equal Product Approval Request Form' to request approval of equal products before bidding or before installation.

SECTION 01 6600 DELIVERY, STORAGE, AND HANDLING REQUIREMENTS

- A. Deliver, store, and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Coordinate delivery with installation time.
- C. Deliver products to site in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

- D. Inspect products upon delivery to ensure compliance with Contract Documents, and to ensure that products are undamaged and properly protected.
- E. Store products subject to damage by elements above ground, under cover in weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

SECTION 01 7000 EXECUTION REQUIREMENTS

- A. Completion Inspection:
 - 1. Owner will conduct Completion Inspection in presence of Contractor and furnish list of items to be corrected.
 - 2. Contractor will notify Owner in writing when items have been corrected.

SECTION 01 7400 CLEANING AND WASTE MANAGEMENT

- A. Disposal Of Waste:
 - 1. Remove waste materials from Project site and legally dispose of them in landfill or incinerator acceptable to authorities having jurisdiction:
 - 2. Burning: Do not burn waste materials.

SECTION 01 7700 CLOSEOUT PROCEDURES

- A. Final Acceptance:
 - 1. Prior to this inspection, Contractor shall discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 - 2. Punch list created is to be substantially complete.

SECTION 01 7800 CLOSEOUT SUBMITTALS

- A. Operations And Maintenance Data: Include in existing building Operations And Maintenance Manual that include:
 - 1. Project Manual:
 - a. Detectable Warning Panel if included for Project:
 - (1) Copy Operations and Data: Operations and maintenance submittals.
 - (2) Warranty Documentation: Copies of warranties required.
 - (3) Record Documentation: Documentation submittals.

END OF SECTION

DIVISION 03: CONCRETE

03 3000 CAST-IN-PLACE CONCRETE

03 3112 CAST-IN-PLACE SIDEWALKS, CURBS AND GUTTERS

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SECTION 03 3112**CAST-IN-PLACE SIDEWALKS, CURBS AND GUTTERS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install concrete work as described in Contract Documents including:
 - a. Concrete Formwork:
 - 1) Required formwork ready for placing of concrete.
 - 2) Strip and dispose of formwork.
 - b. Concrete:
 - 1) Concrete mix information and use of admixtures.
 - c. Concrete Sealer:
 - 1) Sealer applied to new exterior concrete surfaces exposed to freeze/thaw cycles and deicing salts or where exterior concrete is placed after about September 1st or as otherwise desired by Facilities Manager.
 - d. Elastomeric Joint Sealants for expansion joints.
 - e. Expansion Joint Filler Material.
 - f. Membrane Curing.
 - g. Site Materials:
 - 1) Aggregate base.
 - 2) Fill.
 - 3) Compaction requirements.
- B. Related Requirements:
 - 1. Section 01 0000: 'General Requirements':
 - a. Section 01 3100: 'Project Management and Coordination' for pre-installation conference.
 - b. Section 01 4000: 'Quality Requirements' for administrative and procedural requirements for quality assurance and quality control.

1.2 REFERENCES

- A. Association Publications:
 - 1. American Concrete Institute, Farmington Hills, MI www.concrete.org. Abstracts of ACI Periodicals and Publications.
 - a. ACI 305R-10, '*Guide to Hot Weather Concreting*'.
 - b. ACI 306R-10, '*Guide to Cold Weather Concreting*'.
- B. Definitions:
 - 1. Cementitious Materials: Portland cement alone or in combination with one or more of following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.
 - 2. Concrete Membrane Curing: Process by which hydraulic-cement concrete matures and develops hardened properties, over time, as result of continued hydration of cement in presence of sufficient water and heat. Also used to describe action taken to maintain moisture and temperature conditions in freshly placed concrete.
 - 3. Concrete Sealers: As used in this specification, sealers are applied to new exterior concrete surfaces to protect from surface damage, corrosion, and staining. Sealers either block pores in concrete to reduce absorption of water and salts or form impermeable layer which prevents such materials from passing. Concrete sealer, when selected and applied properly, will prevent intrusion of water and deicers, minimizing freeze/thaw damage.

C. Reference Standards:

1. American Association of State and Highway Transportation Officials:
 - a. Membrane Concrete Curing:
 - 1) AASHTO M 148-05, 'Standard Specification for Liquid Membrane-Forming Compounds for Curing'.
2. ASTM International:
 - a. Admixtures:
 - 1) ASTM C260/C260M-10a(2016), 'Standard Specification for Air-Entraining Admixtures for Concrete'.
 - 2) ASTM C494/C494M-16, 'Standard Specification for Chemical Admixtures for Concrete'.
 - 3) ASTM C618-15, 'Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete'.
 - 4) ASTM C1293-08b(2015), 'Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction'.
 - b. Concrete:
 - 1) ASTM C33/C33M-16, 'Standard Specification for Concrete Aggregates'.
 - 2) ASTM C94/C94M-16a, 'Standard Specification for Ready-Mixed Concrete'.
 - c. Concrete Sealer:
 - 1) ASTM C672/C672M-12 'Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals'.
 - d. Elastomeric Joint Sealant:
 - 1) ASTM C920-14a, 'Standard Specification for Elastomeric Joint Sealants'.
 - e. Expansion Joint Filler Material:
 - 1) ASTM D1751-04(2013), 'Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)'.
 - f. Membrane Concrete Curing:
 - 1) ASTM C309-11, 'Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete'.
 - g. Site Materials:
 - 1) ASTM D1557-12, 'Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))'.
 - 2) ASTM D2487-11, 'Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)'.
3. CSA Group (Canadian Standards Association):
 - a. Admixtures:
 - 1) CSA A23.1-14/A23.2-14, 'Concrete Materials and Methods of Concrete Construction / 'Test Methods and Standard Practices for Concrete'.

1.3 ADMINISTRATIVE REQUIREMENTS**A. Pre-Installation Conference:**

1. Participate in MANDATORY pre-installation conference as specified in Section 01 3100 and held jointly with related specification included in this specification:
2. In addition to agenda items specified in Section 01 3100, review following with Facilities Manager:
 - a. Review approved mix design requirements and use of admixtures.
 - b. Review placement, finishing, and curing of concrete including cold and hot weather requirements.
 - c. Review membrane curing requirements.
 - a. Review elastomeric joint sealant requirements.
 - b. Review expansion joint filler material requirements and joint layout for curbs and gutters.
 - c. Review location of sidewalk, curb, and gutter control joints and expansion joints. Contractor to provide layout plan showing locations if needed.
 - d. Review concrete sealer requirements.
 - e. Review site materials requirements.

B. Scheduling:

1. Elastomeric Joint Sealant:

- a. Schedule work after Membrane Concrete Curing is placed and before Concrete Sealer is applied.

1.4 SUBMITTALS

- A. Action Submittals:
 - 1. Product Data:
 - a. Concrete Sealer:
 - 1) Manufacturer's product literature or cut-sheets for specified products.
 - b. Elastomeric Joint Sealant:
 - 1) Manufacturer's product literature or cut-sheets for specified products.
 - 2) Material Safety Data Sheets (MSDS).
 - c. Expansion Joint Filler Material:
 - 1) Manufacturer's product literature or cut-sheets for specified products.
 - d. Membrane Concrete Curing:
 - 1) Manufacturer's product literature or cut-sheets for specified products.
 - 2) Material Safety Data Sheets (MSDS).
- B. Informational Submittals:
 - 1. Design Data:
 - a. Mix Design:
 - 1) Furnish proposed mix design to Facilities Manager for review prior to commencement of Work.
 - a) Mix design shall show proposed admixture, amount and usage instructions.
 - b) Mineral: An amount of specified Class F (or Class C where Class F is not available) fly ash not to exceed twenty-five (25) percent of weight of cement may be substituted for cement. If substituted, consider fly ash with cement in determining amount of water necessary to provide specified water / cement ratio
 - c) Chemical: Specified accelerator or retarder may be used if necessary to meet environmental conditions.
 - 2. Source Quality Control Submittals:
 - a. Concrete mix design: Submit mix designs to meet following requirements:
 - 1) Proportions:
 - a) Mix Type D:
 - (1) 4500 psi (31.03 MPa) minimum at twenty-eight (28) days.
 - (2) Water / Cementitious Material: 0.40 maximum by weight.
 - (3) Use twenty-five (25) percent Class F (or Class C where Class F is not available) fly ash as part of cementitious material.
 - b) Air Entrainment: Six (6) percent, plus or minus 1-1/2 percent for exterior concrete and foundation walls exposed to freeze/thaw cycles.
 - c) Do not add water any time during mixing cycle above amount required to meet specified water / cement ratio. No reduction in amount of cementitious material is allowed.
 - 2) Slump:
 - a) 4 inch (100 mm) slump maximum before addition of high range water reducer.
 - 3) Admixtures:
 - a) Mineral: An amount of specified Class F (or Class C where Class F is not available) fly ash not to exceed twenty-five (25) percent of weight of cement may be substituted for cement. If substituted, consider fly ash with cement in determining amount of water necessary to provide specified water / cement ratio.
 - b) Chemical: Specified accelerator or retarder may be used if necessary to meet environmental conditions.

1.5 QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
 - 1. Concrete Sealer:

- a. Comply with applicable VOC standards and other local requirements.
- 2. Membrane Concrete Curing:
 - a. Comply with applicable VOC standards and other local requirements.
- B. Qualifications: Requirements of Section 01 4301 applies, but is not limited to following:
 - 1. Installers and Installation Supervisor:
 - a. ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
 - 2. Ready-Mix Supplier:
 - a. Comply with ASTM C94/C94M requirements and be certified according to NRMCA's 'Certification of Ready Mixed Concrete Production Facilities'.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 - 1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage And Handling Requirements:
 - 1. Follow Manufacturer's written instructions for handling and storage of products.
 - 2. Concrete Sealer:
 - a. Store in unopened containers in clean, dry area between 35 deg F (2 deg C) and 110 deg F (43 deg C) or as directed by Manufacturer's instruction.
 - 3. Elastomeric Joint Sealant:
 - a. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDS).
 - b. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
 - c. Store in a cool dry location, but never under 40 deg F (4 deg C) or subjected to sustained temperatures exceeding 90 deg F (32 deg C) or as per Manufacturer's written recommendations.
 - d. Do not use sealants that have exceeded shelf life of product.
 - 4. Expansion Joint Filler Material:
 - a. Store materials in clean, dry area in accordance with manufacturer's instructions.
 - b. Protect materials during handling and application to prevent damage.
 - 5. Membrane Concrete Curing:
 - a. Store in unopened containers in clean, dry area between 35 deg F (2 deg C) and 110 deg F (43 deg C) (Keep from freezing) or as directed by Manufacturer's instruction.
 - b. Shelf Life: Do not use curing compound that is over one (1) year from manufacturer date.

1.7 FIELD CONDITIONS

- A. Ambient Conditions:
 - 1. Concrete:
 - a. For Cold Weather and Hot Weather Limitations, see Preparation in Part 3 of this specification.
 - 2. Concrete Sealer:
 - a. Follow printed Manufacturer's instruction for environmental hazards.
 - b. Follow printed Manufacturer's instruction for ambient conditions for application of product including:
 - 1) Minimum and maximum application temperatures.
 - 2) Application precautions when rain is expected.
 - 3. Elastomeric Joint Sealant:
 - a. Do not install sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.
 - b. Follow Manufacturer's temperature recommendations for installing sealants.
 - 4. Expansion Joint Filler Material:

- a. Do not install sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.
- 5. Membrane Concrete Curing:
 - a. Do not apply curing compound when temperature of concrete is less than 40 deg F (4.4 deg C).
- 6. Site Materials (Aggregate Base and Fill):
 - a. Do not perform work during unfavorable conditions as specified including:
 - 1) Presence of free surface water.
 - 2) Over-saturated sub base materials.

1.8 WARRANTY

- A. Manufacturer Warranty:
 - 1. Elastomeric Joint Sealant:
 - a. Provide Manufacture standard warranty covering sealant materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer Contact List:
 - 1. Admixtures:
 - a. BASF (Construction Chemicals Division), Cleveland, OH www.master-builders-solutions.basf.us/en-us.
 - b. Euclid Chemical Company, Cleveland, OH www.euclidchemical.com.
 - c. Fritz-Pak Concrete Admixtures, Dallas, TX www.fritzpak.com.
 - d. Grace Construction Products, Cambridge, MA www.graceconstruction.com and Grace Canada Inc, Ajax, ON (905) 683-8561.
 - e. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com and Sika Canada, Pointe Claire, QC www.sika.ca.
 - 2. Concrete Sealer:
 - a. BASF (Construction Chemicals Division), Cleveland, OH www.master-builders-solutions.basf.us/en-us.
 - b. Euclid Chemical Company, Cleveland, OH www.euclidchemical.com.
 - c. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com and Sika Canada, Pointe Claire, QC www.sika.ca.
 - d. TK Products, Minnetonka, MN www.tkproducts.com.
 - 3. Elastomeric Joint Sealant:
 - a. Dow Corning Corp., Midland, MI www.dowcorning.com.
 - b. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com or Sika Canada Inc, Pointe Claire, QC www.sika.ca.
 - 4. Expansion Joint Filler Material:
 - a. W R Meadows, Hampshire, IL www.wrmeadows.com.
 - 5. Membrane Concrete Curing:
 - a. Dayton Superior Specialty Chemicals, Kansas City, KS www.daytonsuperiorchemical.com.
 - b. L & M Construction Chemicals, Omaha, NE www.lmcc.com.
 - c. W R Meadows, Hampshire, IL www.wrmeadows.com.

2.2 SYSTEM

- A. Design Criteria:
 - 1. Concrete:
 - a. Conform to requirements of ASTM C94/C94M unless specified otherwise:
 - b. Capacities:
 - 1) For testing purposes, following concrete strengths are required:

- a) At 7 days: 70 percent minimum of twenty-eight (28) day strengths.
- b) At 28 days: 100 percent minimum of twenty-eight (28) day strengths.

B. Materials:

- 1. Aggregates:
 - a. Cement: Meet requirements of ASTM C33/C33M.
- 2. Water: Clear, apparently clean, and potable.
- 3. Admixtures And Miscellaneous:
 - a. Mineral:
 - 1) Fly Ash: Meet requirements of ASTM C618, Class F (or Class C where Class F is not available) and with loss on ignition (LOI) of three (3) percent maximum.
 - b. Chemical:
 - 1) No admixture shall contain calcium chloride nor shall calcium chloride be used as an admixture. All chemical admixtures used shall be from same manufacturer and compatible with each other.
 - 2) Air Entraining Admixture:
 - a) Meet requirements of ASTM C260/C260M (USA Projects).
 - b) Meet requirements of CSA A23.1/A23.2 (Canadian Projects).
 - c) Type Two Acceptable Products:
 - (1) MasterAir VR 10 (formally MB-VR), Master AE 90 (formally MB-AE) or MasterAir AE 400 (formally EverAir Plus) by BASF.
 - (2) Air Mix 200 Series or AEA-92 Series by Euclid.
 - (3) Air Plus or Super Air Plus by Fritz-Pak.
 - (4) Sika Air by Sika.
 - (5) Daravair or Darex Series AEA by W R Grace.
 - (6) Equal as approved by Facilities Manager before use. See Section 01 6200.
 - 3) Water Reducing Admixture:
 - a) Meet requirements of ASTM C494/C494M, Type A and containing not more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - (1) MasterPozzoloth (formerly Pozzoloth) Series by BASF.
 - (2) Eucon WR 75 or Eucon 91 by Euclid.
 - (3) FR-2 or FR-3 by Fritz-Pak.
 - (4) Plastocrete 160 by Sika.
 - (5) Daracem, WRDA, or MIRA Series by W R Grace.
 - (6) Equal as approved by Facilities Manager before use. See Section 01 6200.
 - 4) Water Reducing, Retarding Admixture:
 - a) Meet requirements of ASTM C494/C494M, Type D and contain no more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - (1) MasterPozzoloth (formerly Pozzoloth) Series by BASF.
 - (2) Eucon Retarder 75 by Euclid.
 - (3) FR-1 or Modified FR-1 by Fritz-Pak.
 - (4) Plastiment by Sika
 - (5) Daratard Series or Recover by W R Grace.
 - (6) Equal as approved by Facilities Manager before use. See Section 01 6200.
 - 5) High Range Water Reducing Admixture (Superplasticizer):
 - a) Meet requirements of ASTM C494/C494M, Type F or G and containing not more than 0.05 percent chloride ions.
 - b) Type Two Acceptable Products:
 - (1) MasterRheobuild 1000 (formerly Rheobuild 1000) or MasterGlenium (formerly Glenium) Series by BASF.
 - (2) Eucon 37 or Eucon 537 by Euclid.
 - (3) Supercizer 1 through 7 by Fritz-Pak.
 - (4) Sikament 300 by Sika.
 - (5) Daracem or ADVA Series by W R Grace.
 - (6) Equal as approved by Facilities Manager before use. See Section 01 6200.
 - 6) Non-Chloride, Non-Corrosive Accelerating Admixture:
 - a) Meet requirements of ASTM C494/C494M, Type C or E and containing not more than 0.05 percent chloride ions.

- b) Type Two Acceptable Products:
 - (1) MasterSet AC 534 (formerly Pozzolith NC 534) or MasterSet AC 122 (formerly Pozzolith122HE) or MasterSet FP 20 (formerly Pozzutec 20+) by BASF.
 - (2) Accelguard 80 by Euclid.
 - (3) Daraset, Polarset or Lubricon by W R Grace.
 - (4) Equal as approved by Facilities Manager before use. See Section 01 6200.
- 7) Alkali-Silica Reactivity Inhibiting Admixture:
 - a) Specially formulated lithium nitrate admixture for prevention of alkali-silica reactivity (ASR) in concrete. Admixture must have test data indicating conformance to ASTM C1293.
 - b) Type Two Acceptable Products:
 - (1) Eucon Integral ARC by Euclid.
 - (2) RASIR by W R Grace.
 - (3) Equal as approved by Facilities Manager before use. See Section 01 6200.

2.3 COMPONENTS

- A. Concrete Forms:
 - 1. Wood, metal, or plastic as arranged by Contractor:
 - a. Forming material shall be compatible with specified form release agents and with finish requirements for concrete to be left exposed or to receive a smooth rubbed finish.

2.4 MATERIALS

- A. Site Materials:
 - 1. General:
 - a. Required where new sidewalks, curbs, gutters, or stairs where new compacted aggregate base and fill are included in Project.
 - b. Required under replaced sidewalk, curb, gutters where unstable aggregate base and subgrade needs to be replaced.
 - c. Required under where site grades are revised.
 - d. Remove and replace existing soft or unstable aggregate base and subgrade with compacted fill and aggregate base.
 - 2. Fill:
 - a. Well graded material conforming to ASTM D2487 free from debris, organic material, frozen materials, brick, lime, concrete, and other material which would prevent adequate performance of backfill.
 - b. Fill shall comply with soil classification groups GW, CL, GP, GM, SW, SP, or SM. Fill may not contain stones over 6 inches (150 mm) diameter and ninety-five (95) percent minimum of fill shall be smaller than 1-1/2 inch (38 mm) in any direction.
 - 3. Aggregate Base:
 - a. Road Base to conform to State DOT Specifications or 3/4 inch (19 mm) open graded gravel.

2.5 ACCESSORIES

- A. Concrete Sealer:
 - 1. Description: Concrete sealer that protects new or existing exterior concrete from freeze/thaw cycles and deicing salts.
 - 2. Design Criteria:
 - a. Penetrating water repellent silane concrete sealers are to be used.
 - b. Silane Based Sealers:
 - 1) Protects concrete from freeze/thaw cycles and deicing salts.
 - 2) Resists penetration of water and deicing salts.
 - 3) One hundred (100) percent silane active ingredient content.
 - 4) Penetrating sealer.

- 5) Water repellent.
- 6) Clear (colorless, non-yellowing). Surface appearance after application: unchanged.
3. Limitations:
 - a. If Low VOC product are required or desired, use only those products listed as 'Low VOC' in acceptable products below.
4. Type One Acceptable Products. See Section 01 6200 for definition of Categories:
 - a. Silane Based Sealers:
 - 1) MasterProtect H 1000 by BASF, Cleveland, OH www.master-builders-solutions.basf.us.
 - a) Low VOC.
 - 2) Weather Worker J29A by Dayton Superior Corporation, Miamisburg, OH www.daytonsuperior.com.
 - 3) Baracade Silane 100 by Euclid, Cleveland, OH www.euclidchemical.com.
 - a) Low VOC.
 - 4) Sikagard 705L by Sika Corporation, Lyndhurst, NJ www.usa.sika.com.
 - a) Low VOC.
 - 5) TK-590-100 by TK Products, Minnetonka, MN www.tkproducts.com.
 - 6) Equal product meeting design criteria requirements as approved by Facilities Manager before use. See Section 01 6200.
- B. Membrane Concrete Curing:
 1. Description: Dissipating membrane curing agent that cures freshly placed concrete.
 2. Design Criteria:
 - a. VOC-compliant compound.
 - b. Meet requirements of ASTM C309 and AASHTO M 148, Type 1 or 1-D, Class B.
 - c. Gradually dissipate after twenty-eight (28) days without leaving stain or discoloring concrete surface.
 3. Type One Acceptable Products:
 - a. Exterior Concrete:
 - 1) Clear Cure J7WB by Dayton Superior Corporation, Miamisburg, OH www.daytonsuperior.com.
 - 2) L&M Cure R by L&M Construction Chemicals, Inc. Omaha, NE www.lmcc.com.
 - 3) 1100-Clear by W. R. Meadows, Inc. Hampshire, IL www.wrmeadows.com.
 - b. Equal as approved by Facilities Manager before use. See Section 01 6200.
- C. Elastomeric Joint Sealant:
 1. Expansion Joints:
 - a. Design Criteria:
 - 1) Meet following standard for sealants: ASTM C920: Type S, Grade NS, Class 100/50 Use T, NT, M, G, A, and O.
 - b. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Dow Corning:
 - a) Primer: 1200 Prime Coat.
 - b) Sealant: 790 Silicone Building Sealant.
 - 2) Sika:
 - a) Primer: Sikasil Primer-2100.
 - b) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.
- D. Expansion Joint Filler:
 1. Material:
 - a. Design Criteria:
 - 1) Resilient, flexible, non-extruding, expansion-contraction joint filler meeting requirements of ASTM D1751.
 - 2) **1/2 inch (12.7 mm)** thick.
 - 3) Resilience:
 - a) When compressed to half of original thickness, recover to minimum of seventy (70) percent of original thickness.
 - b. Type Two Acceptable Products:
 - 1) Sealtight Fibre Expansion Joint by W. R. Meadows.
 - 2) Equal as approved by Facilities Manager before use. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification Of Conditions:
 - 1. Concrete Forms:
 - a. Verify dimensions and spot elevations for locations of forms for concrete sidewalks, curbs, gutters, and stairs if included are correct before concrete is placed.
 - 1) Notify Facilities Manager of incorrect dimensions or spot elevations in writing.
 - 2) Do not place concrete until corrections are made and verified.
 - 2. Elastomeric Joint Sealant:
 - a. Examine substrate surfaces and joint openings are ready to receive Work.
 - 1) Verify joint surfaces are clean and dry.
 - 2) Ensure concrete surfaces are fully cured.
 - b. Notify Facilities Manager of unsuitable conditions in writing:
 - 1) Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. General:
 - 1. Remove water and debris from space to be placed.
- B. Site Materials:
 - 1. Before placing fill, aggregate base, or finish work, prepare existing subgrade as follows:
 - a. Finish grade to match existing grades.
- C. Concrete Forms:
 - 1. General:
 - a. Assemble forms so forms are sufficiently tight to prevent leakage.
 - b. Use new forms, or used forms that have been cleaned of loose concrete and other debris from previous concreting and repaired to proper condition.
- D. Concrete Mixing:
 - 1. General:
 - a. All concrete shall be machine mixed.
 - b. Re-tempering partly set concrete will not be permitted.
 - 2. Cold Weather Concreting Procedures:
 - a. As per ACI 306R 'Standard Specification for Cold Weather Concreting'.
 - b. Protect soil supporting concrete footings from freezing under any circumstances.
 - 3. Hot Weather Concreting Procedures:
 - a. As per ACI 305R 'Specification for Hot Weather Concreting'.
- E. Concrete Sealer:
 - 1. Surface Preparation:
 - a. Take necessary precautions to protect adjoining property.
 - b. Do not contaminate any body of water by direct application, cleaning of equipment or disposal of wastes.
 - 2. Cleaning:
 - a. Clean concrete surface of membrane curing and all dirt, mud spots, silt spots, loose material, vegetation, grease or oil spots, and other objectionable and foreign material including any spillage of any material that has adhered to concrete.
 - b. Remove debris, sand, dirt, and dust from concrete surface.
 - c. Power brooms, power blowers, air compressors, water flushing equipment, and blowers are acceptable equipment for cleaning concrete surface.
 - d. Concrete surface is to be dry, clean and sound.
- F. Elastomeric Joint Sealant:

1. Surfaces shall be clean, dry, free of dust, oil, grease, dew, frost or incompatible sealers, paints or coatings that may interfere with adhesion. Prepare substrates in accordance with Manufacturer's instructions.
2. Clean joint surfaces of contaminants capable of affecting sealant bond to joint surface using Manufacturer's recommended instructions for joint preparation methods.
3. Remove dirt, dust, oils, wax, paints, and contamination capable of affecting primer and sealant bond.

3.3 INSTALLATION

A. Site Materials:

1. Fill and Aggregate Base:
 - a. General:
 - 1) Do not place aggregate base material when subgrade is frozen or unstable.
 - 2) Uniformly spread aggregate base material with equipment except in limited or restricted areas where use of hand spreading is allowed.
 - 3) Remove all standing storm water.
 - b. Fill: Material shall be well-graded granular material with maximum size less than 3 inch (76 mm) and with not more than fifteen (15) percent passing No. 200 sieve.
 - c. Aggregate Base: Place 4 inches (100 mm) minimum of aggregate base, level, and compact.
 - d. Compaction:
 - 1) Testing and Inspection is not required for site materials.
 - 2) Fill:
 - a) Place in 8 inch (200 mm) maximum layers, dampen but do not soak, and mechanically tamp to ninety-five (95) percent minimum of maximum laboratory density as established by ASTM D1557.
 - 3) Aggregate Base:
 - a) Remove or repair improperly prepared areas as directed by Facilities Manager.
 - b) Compact to ninety-five (95) percent minimum density as determined by ASTM D1557.
 - c) Proof roll aggregate base using 35 ton roller with tire pressure of 120 psi (827 kPa) or by using comparable industry standard method to determine sufficient stability of subgrade surface.

B. Placing Concrete:

1. General:
 - a. Place as soon after mixing as possible.
 - b. Deposit as nearly as possible in final position.
 - c. No concrete shall be deposited in water.
 - d. Placing of concrete shall be continuous until panel or section is complete.
 - e. Consolidate concrete.
 - f. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any degree into landscaped areas.
 - g. Do not embed aluminum in concrete.
 - h. Do not use contaminated, deteriorated, or re-tempered concrete.
 - i. Avoid accumulation of hardened concrete.
2. Concrete Sidewalks, Curbs and Gutters:
 - a. Sidewalks:
 - 1) Slope with cross slope of 1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm) (one to two percent) in direction of intended drainage.
 - 2) Slope away from building 1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm) (one to two percent) minimum.
 - 3) Do not dust with cement.
 - 4) Concrete walks shall be screeded to bring surface to grades and lines as indicated. Surface shall be floated with wood float with no coarse aggregate showing and then given broom finish before concrete sets.
3. Joints:
 - a. Control Joints:

- 1) Form control joints with early-entry, dry-cut saws as soon as final trowel operations are complete and joints can be cut without raveling.
- 2) Depth of control joints shall be approximately one quarter of concrete slab thickness, but not less than **one inch (25 mm)**.
- 3) Control joints to be hand tooled in sidewalks, curbs and gutters.
- 4) Table One:

Concrete Control Joint On-Center Spacing (+/-)		
Sidewalks	4 feet to 6 feet	1.2 meters to 1.8 meters
Curbs and Gutters	10 feet	3.0 meters

b. Elastomeric Joint Sealant:

- 1) Install so top of expansion joint material is **1/4 inch (6 mm)** below finished surface of concrete.
- 2) No expansion joint required between curbs and sidewalks parallel to curb.
- 3) Provide expansion joints at ends of exterior site concrete elements that are perpendicular to and terminate at curbs, building foundations or other concrete elements (i.e. sidewalks, mow strips, aprons).
- 4) Provide expansion joints between sidewalks that are parallel, and adjacent, to storage building or main building.
- 5) Table Two:

Concrete Expansion Joint (Isolation) On-Center Spacing (+/-)		
Sidewalks, Curbs and Gutters	40 feet to 100 feet	12 meters to 30 meters

- 6) Seal expansion joints as specified in Section 07 9213 for following areas:
 - a) Between entryway slabs and building foundations.
 - b) Between sidewalks and building foundations.
 - c) Within curbs and gutters.
- 7) Expansion joints are not required to be sealed for following areas:
 - a) Within sidewalks.

C. Finishing:

1. General:
 - a. Meet requirements of CSA A23.1/A23.2 for concrete finishing (Canadian Projects).
2. Concrete Sidewalks, Curbs and Gutters:
 - a. After completion of floating, performed immediately after screeding and when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1) Provide fine hair finish where grades are less than six (6) percent **1-1/4 inch (32 mm)**.
 - 2) Provide rough hair finish where grades exceed six (6) percent **1-1/4 inch (32 mm)**.
 - 3) Broom finish, by drawing broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide fine line texture acceptable to Facilities Manager. At curb and gutter, apply broom finish longitudinal to curb and gutter flowline.
 - 4) On inclined slab surfaces, provide coarse, non-slip finish by scoring surface with stiff-bristled broom, perpendicular to line of traffic. At curb and gutter, apply broom finish longitudinal to curb and gutter flowline.
 - 5) Do not remove forms for twenty-four (24) hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Facilities Manager.
 - 6) Round edges exposed to public view to **1/2 inch (13 mm)** radius, including edges formed by expansion joints.
 - 7) Remove edger marks.

D. Tolerances:

1. General:
 - a. Maximum Variation Tolerances:
 - 1) Table Three:

Maximum Variation Tolerances		
Thickness, standard	plus 3/8 inch, minus 1/4 inch	plus 9.5 mm, minus 3 mm
Plan, 0 - 20 feet	1/2 inch	12.7 mm
Plan, 40 feet or greater	3/4 inch	19 mm

E. Concrete Forms: Remove forms.

3.4 APPLICATION

A. Concrete Sealer:

1. General:
 - a. Apply concrete sealer after surface preparation has been completed as per Manufacturer's recommendations.
 - b. Follow Manufacturer's ambient conditions for minimum and maximum application temperatures and application precautions when rain is expected.
 - c. Stir material thoroughly before and during application if required by Manufacturer.
 - d. Do not apply sealer if standing water is visible on concrete surface to be treated.
 - e. Apply even distribution of sealer.
 - f. Do NOT over apply. All product should penetrate substrate with no surface build-up. Any excess or puddles of material must be removed.
2. Apply Concrete Sealer:
 - a. Silane Based Sealers:
 - 1) Do not apply below 32 deg F (0 deg C).
 - 2) Apply at rate of about 1 gallon (3.785 liters) per 300 sq ft (27.8 sq meters) or as per Manufacturer's recommendations depending upon absorbency of concrete surface.
3. Allow Concrete Sealer to dry as per Manufacturer's recommendations:

B. Elastomeric Joint Sealant:

1. General:
 - a. Apply silicone sealant in accordance with Manufacturer's instructions.
 - b. Do not use damaged or deteriorated materials.
 - c. Install primer and sealants in accordance with Manufacturer's instructions.
 - d. Install sealants immediately after joint preparation.
2. Sealant:
 - a. Apply sealant with hand-caulking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
 - b. Fill joint opening to full and proper configuration.
 - c. Apply in continuous operation.
 - d. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction, i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
 - e. Depth of sealant bite shall be 1/4 inch (6 mm) minimum and 1/2 inch (12.7 mm) maximum, but never more than one half or less than one fourth joint width.

C. Membrane Concrete Curing:

1. Follow Manufacturer's written instructions for preparation, application rates, placement, and cleanup including:
 - a. Apply as soon as brooming or finishing of exterior concrete is complete.
 - b. Spraying application is required.
 - c. Do not dilute or thin product.
 - d. Do not apply when temperature of concrete is less than 40 deg F (4.4 deg C).
 - e. Apply uniformly without puddles or ponding.
 - f. Do not apply before bleed water has dissipated.
 - g. Do not apply over standing water.

3.5 FIELD QUALITY CONTROL

- A. Field Tests And Inspections:
 - 1. Not Required:
- B. Non-Conforming Work: Correct any work found defective or not complying with contract document requirements at no additional cost to Owner.

3.6 CLEANING

- A. General:
 - 1. Concrete Sealer:
 - a. Clean drips and over spray while still wet.
- B. Waste Management:
 - 1. Follow Manufacturer's recommendations for approved disposal of product and containers.
 - a. Do not reuse empty containers.

3.7 PROTECTION

- A. Concrete:
 - 1. Protect concrete that has not received its initial set from precipitation to avoid excess water in mix and unsatisfactory surface finish.
- B. Membrane Concrete Curing:
 - 1. Restrict foot or vehicle traffic as curing membrane dries as recommended by Manufacturer.

END OF SECTION

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DIVISION 31: EARTHWORK

31 1000 SITE CLEARING

31 1100 CLEARING AND GRUBBING

END OF TABLE OF CONTENTS

SECTION 31 1100**CLEARING AND GRUBBING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform clearing and grubbing as necessary to prepare site for grading as described in Contract Documents.
- B. Related Requirements:
 - 1. Pre-installation conference held jointly with other landscape related sections.

PART 2 - PRODUCTS: Not Used**PART 3 - EXECUTION****3.1 PERFORMANCE**

- A. Tree And Brush Removal:
 - 1. Cut off trees, shrubs, brush, and vegetative growth **12 inches (300 mm)** maximum above ground.
 - 2. Do not pull up or rip out roots of trees and shrubs that are to remain. If excavation through roots is required, excavate by hand and cut roots with sharp axe. Make clean, smooth, sloping cuts.
 - 3. Cut roots **6 inches (150 mm)** or larger in diameter only with Architect's written permission.
- B. Grubbing:
 - 1. Grub out stumps and roots **12 inches (300 mm)** minimum below original ground surface, except as follows:
 - a. Entirely remove roots of plants that normally sprout from roots, as identified by Architect.

3.2 CLEANING

- A. Remove from site trees, shrubs, uprooted stumps, vegetative layer, and surface debris and dispose of legally.
- B. Do not bury cuttings, stumps, roots, and other vegetative matter or burnt waste material on site.

END OF SECTION

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DIVISION 32: EXTERIOR IMPROVEMENTS

32 8000 IRRIGATION

32 8423 UNDERGROUND SPRINKLERS

32 9000 PLANTING

32 9001 COMMON PLANTING REQUIREMENTS

32 9121 TOPSOIL PHYSICAL PREPARATION

32 9122 TOPSOIL GRADING

32 9223 SODDING

32 9300 PLANTS

END OF TABLE OF CONTENTS

SECTION 32 8423
UNDERGROUND SPRINKLERS

1. GENERAL

1. SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install planting irrigation system as described in Contract Documents complete with accessories necessary for proper function.
- B. Related Requirements:
 - 1. Section 01 4301: 'Quality Assurance – Qualifications'.
 - 2. Section 31 2213: 'Rough Grading'.
 - 3. Section 31 2216: 'Fine Grading'.
 - 4. Section 31 2316: 'Excavation'.
 - 5. Section 31 2323: 'Fill' for trench compaction.
 - 6. Section 32 9001: 'Common Planting Requirements'.
 - a. Pre-installation conference held jointly with other common planting related sections.
 - 7. Section 32 9120: 'Topsoil And Placement' for topsoil evaluation and placement required for topsoil grading.
 - 8. Section 32 9121: 'Topsoil Physical Preparation'.
 - 9. Section 32 9122: 'Topsoil Grading'.
 - 10. Section 32 9223: 'Sodding'.
 - 11. Section 32 9300: 'Plants'.

2. REFERENCES

- A. Definitions:
 - 1. Dielectric Fittings: Special type of fitting used between dissimilar metals to prevent galvanic action from causing corrosion failure.
 - 2. High Wind Area: As defined in this specification, area with average sustained wind speed of over 7.5 mph.
 - 3. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.
 - 4. Landscape Management Plan (LMP): See Section 32 9001 for definition.
 - 5. Lateral Line: Downstream from electric control valves to pop-up spray heads and drip valve assemblies to emitters. Piping or tubing is under pressure during flow. In areas where potable or secondary water are used, pressure supply line shall be white. In areas where non-potable or reclaimed water are used, pressure supply line shall be purple.
 - 6. Main Line: Downstream from point of connection to electric control valves. Piping is under water-distribution-system pressure when activated by master valve or hydrometer. In areas where potable or secondary water are used, pressure supply line shall be white. In areas where non-potable or reclaimed water are used, pressure supply line shall be purple.
 - 7. Peak Flow: Maximum required flow for given month based on six (6) day week, nine (9) hour day watering window to be used for irrigation system design and to be used in hydraulic analysis.
 - 8. Plant Establishment Period: See Section 32 9001 for definition.
 - 9. Point of Connection: Location where meter for irrigation system is located.
 - 10. Static Water Pressure: Pressure at point of connection when system is not operable.
 - 11. Working Pressure: Pressure at point of connection when system is operable.
- B. Reference Standards:
 - 1. ASTM International:

- a. ASTM D2564-12, 'Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems'.
- b. ASTM F656-15, 'Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings'.

3. ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 1. Provide Coordination for required tests and inspections as described under Field Quality Control in Part 3 EXECUTION for following:
 - a. Substantial Completion Walkthrough: In presence of Landscape Architect or designated Representative(s), plan and provide walk through after completion of irrigation system.
 - b. Irrigation Final Acceptance: In presence of Landscape Architect or designated Representative(s), plan and provide final walk through after completion of all work listed on Substantial Completion walk through list provided by Landscape Architect.
- B. Pre-Installation Conference:
 1. Participate in pre-installation conference as specified in Section 32 9001.
 - a. Irrigation Subcontractor's Representative and Foreman responsible for installation of irrigation system required to be in attendance.
 - b. Schedule pre-installation conference before irrigation system installation begins.
 - c. In addition to agenda items specified in Section 01 3100, review following:
 - 1) Review required tests and inspections and submittal requirements.
- C. Sequencing:
 1. Install sleeves before installation of cast-in-place concrete site elements and paving.

4. SUBMITTALS

- A. Action Submittals:
 1. Product Data:
 - a. Manufacturer's cut sheets for each element of system.
- B. Informational Submittals:
 1. Certificates:
 - a. Irrigation System Acceptance:
 - 1) Upon acceptance of irrigation system, Landscape Architect will provide signed certificate:
 - a) Certificate will include name and signature of Landscape Architect, Landscape Architect's company, Landscape Architect's telephone number, and date of review.
 - b) Certificate will state to best of Landscape Architect's knowledge that the system is in full compliance with Contract Documents.
 - b. Establishment Period Acknowledgement (coordinate with 32 9000 sections):
 - 1) Establishment Period begins at date of Substantial Completion. Landscape Architect will provide certificate acknowledging Establishment Period commencement:
 - a) Certificate will include name and signature of Installer, Installer's company, Installer's telephone number, and date.
 - b) Certificate will include name and signature of Owner's Representative, Owner's Representative Group name, Owner's Representative Group telephone number, and date.
 - c) Certificate will acknowledge date when Establishment Period begins and that it extends one (1) year from that time.
 - c. Training Acknowledgement:
 - 1) Provide certificate acknowledging training has been performed:
 - a) Certificate will include name and signature of Installer, Installer's company, Installer's telephone number, and date.
 - b) Certificate will include name and signature of Owner's Representative, Owner's Representative Group name, Owner's Representative Group telephone number, and date.

- c) Certificate will acknowledge Owner's Representative has been trained in operation and maintenance of system.
- C. Closeout Submittals:
 - 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Submittal Format: Digital format only.
 - b. Operations And Maintenance Data:
 - 1) Include the following information:
 - a) Provide irrigation system operation and maintenance recommendations.
 - b) Provide irrigation system winterization instructions.
 - c) Provide plant establishment period watering schedule.
 - d) Provide post plant establishment period watering schedule.
 - c. Warranty Documentation:
 - 1) Irrigation System Warranty.
 - d. Record Documentation:
 - 1) Provide manufacturer's printed literature and cut sheets for each element of system.
 - 2) Certificates:
 - a) Irrigation System Acceptance.
 - b) Establishment Period Acknowledgement.
 - c) Training Acknowledgement.
 - 3) Irrigation Record Drawings. As installation occurs, prepare accurate record drawing to be submitted before final inspection, including:
 - a) Detail and dimension changes made during construction. Record at time of installation.
 - b) Significant details and dimensions not shown in original Contract Documents.
 - c) Field dimensioned locations of valve boxes, manual drains, quick-coupler valves, control wire runs not in mainline ditch, soil moisture sensors (if soil moisture sensor technology is selected for site) and both ends of sleeves.
 - d) Take dimensions from permanent constructed surfaces or edges located at or above finish grade.
 - e) Take and record dimensions at time of installation.
 - 2. Irrigation Drawings:
 - a. Irrigation Plan:
 - 1) Laminated reduced size:
 - a) Size: 11 by 17 inches.
 - b) Show color key circuits and laminated both sides with 5 mil thick or heavier plastic.
 - c) Mount on 12 x 18 inch hard board drilled with two (2) 1/2 inch holes at top of board.
 - d) Hang on hooks in Custodial Room or location designated by Owner's Representative.
 - 2) Un-Laminated reduced size to be included in Landscape Management Plan (LMP):
 - a) Size: 11 by 17 inches.
 - b) Show color key circuits.
 - 3. Final payment for system will not be authorized until Closeout Submittals are received and accepted by Architect and Landscape Architect.

5. QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. General:
 - a. Work and materials shall be in accordance with latest rules and regulations, and other applicable state or local laws.
 - b. Nothing in Contract Documents is to be construed to permit work not conforming to these codes.
- B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
 - 1. Irrigation Subcontractor:
 - a. Company specializing in performing work of this section.
 - 2. Irrigation Installer:
 - a. Perform installation under direction of foreman or supervisor.

6. DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:

1. Protect materials from damage and prolonged exposure to sunlight.

7. WARRANTY

A. Warranty:

1. Irrigation System:

- a. In addition to standard one (1) year guarantee stipulated in General Conditions Article 12.2., warranty shall include:
 - 1) Filling and repairing depressions and replacing plantings due to settlement of irrigation system trenches.

2.PRODUCTS

1. SYSTEM

A. Manufacturers:

1. Manufacturer Contact List:

- a. 3M, Austin, TX www.3m.com/elpd.
- b. Action Machining Inc, Bountiful, UT www.actionfilters.com.
- c. Amiad www.amiadusa.com.
- d. Apollo Valves by Conbraco Industries, Matthews, NC www.apollovalves.com.
- e. Carson Industries LLC, Glendora, CA www.carsonind.com.
- f. GPH Irrigation Products, Fontana, CA www.gphirrigation.com.
- g. Harrington Corporation (Harco), Lynchburg, VA www.harcofittings.com.
- h. Hunter Industries, San Marcos, CA www.hunterindustries.com.
- i. HydroRain, North Salt Lake, UT www.hydorain.com.
- j. King Innovation, St Charles, MO www.kinginovation.com.
- k. IPS Corporation, Compton, CA www.ipscorp.com.
- l. Leemco, Colton, CA www.leemco.com.
- m. Netafim, Inc. www.netafimusa.com.
- n. Nibco Inc, Elkhart, IN www.nibco.com.
- o. Northstar Industries, LLC, Methuen MA www.northstarind.com.
- p. Orbit Irrigation Products, Inc. Bountiful, UT www.orbitonline.com.
- q. Paige Electric, Union, NJ www.paigewire.com.
- r. Rain Bird Sprinkler Manufacturing Corp, Glendora, CA www.rainbird.com.
- s. Salco by Weathermatic Irrigation Products, Garland, TX www.weathermatic.com.
- t. Toro Company, Irrigation Div, Riverside, CA www.toro.com.
- u. T. Christy Enterprises, Inc. (Christy's), Anaheim, CA www.tchristy.com.
- v. VAF Filtration Systems, Arvada, CO www.vafusa.com.
- w. Weathermatic Irrigation Products, Garland, TX www.weathermatic.com.
- x. Wilkins a Zurn Company, Paso Robles, CA www.zurn.com.

B. Materials:

1. Rock-Free Soil:
 - a. For use as backfill around PVC pipe.
2. Native Material:
 - a. Soil having rocks no larger than 1/2 inch in any dimension.
3. Pea Gravel:
 - a. For use around drains, valves, and quick couplers.
 - b. 1/2 inch maximum dimension, washed rock.
4. Sand: Fine granular material naturally produced by rock disintegration and free from organic material, mica, loam, clay, and other deleterious substances.
5. Native Material: Soil native to project site free of wood and other deleterious materials and rocks over 1-1/2 inches.

6. Topsoil:
 - a. Use soil as described in Section 32 9120, Section 32 9121, and Section 32 9122.
 - b. Achieve depths as described in Section 32 9122.
7. Pipe, Pipe Fittings, And Connections:
 - a. General:
 - 1) Pipe shall be continuously and permanently marked with Manufacturer's name, size, schedule, type, and working pressure.
 - 2) Pipe sizes shown on Contract Drawings are minimum. Larger sizes may be substituted at no additional cost to Owner.
 - b. Piping:
 - 1) Main Line: Schedule 40 PVC pipe.
 - 2) Lateral Lines: Series SIDR 15 HDPE 3408 100 lbs Polyethylene unless shown otherwise on Contract Drawings.
 - c. Fittings: Same material as pipe, except where detailed otherwise.
 - 1) Use dielectric union fittings between dissimilar metal pipes and fittings.
 - d. Sleeves:
 - 1) Under Parking Area And Driveway Paving: Schedule 40 PVC Pipe.
 - 2) All Other: Class 200 PVC Pipe.
 - 3) Sleeve diameter shall be two (2) times larger than pipe installed in sleeve.
8. Sprinkler Heads:
 - a. Each type of head shall be product of single manufacturer.
 - b. Shrub Head Bubblers:
 - 1) As shown on drawings.
 - c. Spray Heads in Shrub and Ground Cover Areas:
 - 1) As shown on drawings.
 - d. Spray Heads in Lawn Areas:
 - 1) As shown on drawings.
 - e. Rotary Stream Heads in Lawn and Shrub Areas:
 - 1) As shown on drawings.
 - f. Rotor Pop-ups:
 - 1) As shown on drawings.
9. Sprinkler Risers:
 - a. Spray Heads (Pre-Manufactured Swing Assemblies):
 - 1) Type Two Acceptable Products:
 - a) Hunter: SJ-512 or SJ-7512.
 - b) Rain Bird model SA125050.
 - c) Hydorain: Blu-lock model BLJ-050-MC-1..
 - d) Equal as approved by Architect before use. See Section 01 6200.
 - b. Spray Heads (Field Manufactured Assemblies):
 - 1) Three (3) schedule 40 street ells or Marlex street ells connected to lateral tee to form an adjustable riser or pop-up riser as detailed.
 - 2) Risers for sprinkler heads 14 inches long minimum and 24 inches maximum.
 - a) Type Two Acceptable Products:
 - (1) Hunter: FLEXsg tubing with HSBE spiral barbed fittings.
 - (2) Hydro-Rain: Blu-lock Swing pipe & fittings.
 - (3) Rainbird: Swing Pipe with barbed fittings.
 - (4) Toro: Super Funny Pipe with barbed fittings, SPFA-5125, SPFA-51275.
 - (5) Equal as approved by Architect before installation. See Section 01 6200.
 - c. Rotor Pop-Up Sprinklers (Pre-Manufactured Assemblies):
 - 1) Type Two Acceptable Products:
 - a) 3/4 inch rotor pop-up sprinklers shall have an adjustable pre-assembled swing assembly riser. Swing assemblies shall be 3/4 inch x 12 inch and shall be threaded both ends. Swing assemblies shall be:
 - (1) Blu-lock: Model BLJ-075-TT-12.
 - (2) Rain Bird: Model TSJ-12075.
 - (3) Hunter: SJ-712 12 inch thread.
 - b) 1 inch inlet rotor pop-up sprinklers shall have an adjustable pre-assembled double swing joint riser. Swing joints shall be 1 inch x 12 inch and shall be threaded both ends. Swing joint riser shall be:
 - (1) Rain Bird: Model TSJ-12075.

- 2) Equal as approved by Architect before installation:
- d. Rotor Pop-Up Sprinkler Heads (Field Manufactured Assemblies):
 - 1) Pop-up rotor sprinkler heads shall have adjustable riser assembly, three (3) ell swing joint assembly, unless detailed otherwise on Contract Drawings:
 - a) These swing joint fittings shall be of schedule 40 PVC plastic and nipples schedule 80 gray PVC unless otherwise designated on Contract Drawings.
 - b) Horizontal nipple parallel to side of lateral line shall be 8 inches long minimum.
 - c) All other nipples on swing joint riser shall be of length required for proper installation of sprinkler heads.
- 10. Automatic Irrigation Controller And Control Wiring:
 - a. Automatic Controller:
 - 1) Use existing controller.
 - b. Control Wiring:
 - 3) Waterproof Wire Connectors:
 - a) Control wire connections shall consist of properly-sized wire nut inserted in waterproof grease cap:
 - b) Type Two Acceptable Products:
 - (1) DBY or DBR by 3M.
 - (2) 'One Step' 20111SP by King Innovation.
 - (3) DB 57905, 57505 by Orbit.
 - (4) Equal as approved by Architect before installation. See Section 01 6200.
 - c. Automatic Valves:
 - 1) As shown on drawings.
 - d. Backflow Preventer:
 - 2) Existing, as shown on drawings.
- 14. Solvent Cement:
 - a. Category Four Approved Products. See Section 01 6200 for definitions of Categories:
 - 1) Primer:
 - a) Meet ASTM F656 standard and applicable sections of latest edition of '*Uniform Plumbing Code*'.
 - b) Meet NSF/ANSI standard for use on potable water applications.
 - c) Low VOC emissions and compliant with LEED.
 - d) Product: Weld-On P-70 primer by IPS.
 - 2) PVC Solvent Cement:
 - a) Heavy bodied, medium setting, high strength:
 - (1) Meet ASTM D2564 standard and applicable sections of latest edition of '*Uniform Plumbing Code*'.
 - (2) Meet NSF/ANSI standard for use on potable water applications.
 - (3) Meet CSA standards for use in pressure and non-pressure potable water applications.
 - (4) Low VOC emissions and compliant with LEED.
 - (5) Product: Weld-On 711 Low VOC PVC Cement by IPS.
 - b) Flexible, medium bodied, fast setting, high strength (flexible pipe only):
 - (1) Meet ASTM D2564 standard and applicable sections of latest edition of '*Uniform Plumbing Code*'.
 - (2) Meet NSF/ANSI standard for use on potable water applications.
 - (3) Low VOC emissions and compliant with LEED.
 - (4) Product: Weld-On 795 Low VOC Flex PVC Cement by IPS.
- 15. Other Components:
 - a. Recommended by Manufacturer and subject to Architect's review and acceptance before installation.
 - b. Provide components necessary to complete system and make operational.

3.EXECUTION

1. INSTALLERS

- A. Acceptable Installers:

1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

2. EXAMINATION

- A. Verification Of Conditions:
 1. Perform source pressure test at stub-out on main water line provided for irrigation system, or at near-by fire hydrant.
 2. Notify Architect if pressures over 70 psi or under 55 psi are found to determine if some re-design of system is necessary before beginning work on system.

3. PREPARATION

- A. Protection:
 1. Protection of In-Place Conditions:
 - a. Repair or replace work damaged during course of Work at no additional cost to Owner. If damaged work is new, installer of original work shall perform repair or replacement.
 - b. Do not cut existing tree roots measuring over 2 inches in diameter in order to install irrigation lines.
- B. Surface Preparation:
 1. Layout of Irrigation Heads:
 - a. Location of heads and piping shown on Contract Drawings is approximate. Actual placement may vary slightly as is required to achieve full, even coverage without spraying onto buildings, sidewalks, fences, etc.
 - b. During layout, consult with Architect to verify proper placement and make recommendations, where revisions are advisable.
 - c. Minor adjustments in system layout will be permitted to avoid existing fixed obstructions.
 - d. Make certain changes from Contract Documents are shown on Record Drawings.

4. INSTALLATION

- A. Trenching And Backfilling:
 1. Pulling of mainline pipe is not permitted; pulling of lateral line pipe is permitted as shown on drawings.
 2. Excavate trenches to specified depth. Remove rocks larger than 1-1/2 inch in any direction from bottom of trench. Separate out rocks larger than 1-1/2 inch in any direction uncovered in trenching operation from excavated material and remove from areas to receive landscaping.
 3. Cover pipe both top and sides of mainline pipe with 2 inches of rock-free soil or sand as specified under PART 2 PRODUCTS. Remainder of backfill to topsoil depth as specified in Section 32 9122 using native material as specified under PART 2 PRODUCTS and topsoil as specified in Section 32 9120, Section 32 9121 and Section 32 9122.
 4. Do not cover pressure main, valves or fittings until Architect has inspected system and approved pressure test of mainline.
- B. Sleeving:
 1. Sleeve water lines and control wires under walks and paving. Extend sleeves 6 inches minimum beyond walk or pavement edge. Cover sleeve ends until pipes and wires are installed to keep sleeve clean and free of dirt and debris.
 2. Position sleeves with respect to buildings and other obstructions so pipe can be easily removed.
- C. Grades And Draining:
 1. Grade mainline piping, if required, so system can be completely drained and blown out with compressed air.
- D. Installation of Pipe:

1. Install pipe in manner to provide for expansion and contraction as recommended by Manufacturer.
 2. Unless otherwise indicated on Contract Drawings, install main lines with minimum cover of 18 inches based on finished grade.
 3. Install lateral lines that are shown to be trenched with minimum of 12 inches of cover based on finish grade.
 4. Install pipe and wires under driveways or parking areas in specified sleeves 18 inches below finish grade or as shown on Contract Drawings.
 5. Locate pipe so no sprinkler head will be closer than 12 inches from building foundation.
 6. Cut plastic pipe square. Remove burrs at cut ends before installation so unobstructed flow will result.
 7. Mainline shall have solvent weld fittings.
 8. Lateral lines shall have insert fittings; saddles not allowed.
 9. Tape threaded connections with teflon tape.
- E. Control Valves And Control Valve Wiring, if required:
1. Install valves in plastic boxes with reinforced heavy duty plastic covers. Install valves as shown on drawing. Locate valve boxes within 12 inches to 24 inches of sidewalks and shrub bed edges with tops one inch above finish grade. Do not install more than one (1) valve in single box.
 2. Place pea gravel to depth of excavation below bricks or blocks supporting valve boxes. Set valve boxes over valve so all parts of valve can be reached for service. Set cover of valve box one inch above finish grade. Valve box cavity shall be reasonably free from dirt and debris.
- F. Controller:
1. Controller is existing.
- G. Backflow Preventer:
1. Existing.
- H. Sprinkler Heads And Rotor Pop-ups:
1. Set sprinkler heads and quick-coupling valves perpendicular to finish grade.
 2. Do not install sprinklers using side inlets; install using base inlet.
 3. Heads immediately adjacent to mow strips, walks, or curbs shall be one-half inch below top of mow strip, walk, or curb and have one inch to 3 inch clearance between head and mow strip, walk, or curb.
 4. Set sprinkler heads at consistent distance from walks, curbs, and other paved areas by using specified components or other method demonstrated in Pre-Construction Conference.
 5. Heads not located immediately adjacent to mow strips, walks, or curbs shall be one inch above finish grade.
 6. Locate risers with drip nozzles on uphill side of plant within rootball zone.
- I. Before installation of sprinkler heads and heads with drip nozzles, open control valves and use full head of water to flush out system.
- J. Arrange valve stations to operate in an easy-to-view progressive sequence around building.

5. FIELD QUALITY CONTROL

- A. Field Tests and Inspections:
1. Irrigation System: Test all new and existing zones for proper coverage.
 2. Substantial Completion Walkthrough:
 - a. Landscape Architect or designated representative(s) will inspect site and create list of non-conforming items to be resolved prior to Irrigation Final Acceptance. Date on this list will act as date of Landscape Substantial Completion.
 - b. Installations completed after water source has been turned off for season, as determined by Landscape Architect, will be inspected following spring after system can be checked for proper operation.
 3. Irrigation Final Acceptance:

- a. Irrigation Final Acceptance will be awarded when all non-conforming work is brought into conformance.
- B. Non-Conforming Work: Non-conforming work as covered in General Conditions applies, but is not limited to following:
 - 1. Underground Sprinkler System:
 - a. Correct any work found defective or not complying with Contract Document requirements at no additional cost to Owner.

6. ADJUSTING

- A. Sprinkler Heads:
 - 1. Adjust sprinkler heads to proper grade when turf is sufficiently established to allow walking on it without appreciable harm. Such lowering and raising of sprinkler heads shall be part of original contract with no additional cost to Owner.
 - 2. Adjust sprinkler heads for proper distribution and trim so spray does not fall on building.
- B. Watering Time:
 - 1. Adjust watering time of valves to provide proper amounts of water to plants.

7. CLOSEOUT ACTIVITIES

- A. Training:
 - 1. After system is installed and approved, instruct Owner's designated personnel in complete operation and maintenance procedures.
 - a. Describe difference between plant establishment schedule and long term maintenance schedule.
- B. Winterization and Spring Start-Up:
 - 1. During first year of operation, Installer shall shut-down irrigation system prior to freezing temperatures and re-start irrigation system at beginning of growing season:
 - a. Winter Shut-Down is intended to remove all potentially damaging water from irrigation system. Perform following as well as any other efforts necessary to properly winterize system:
 - 1) Turn off water source at point of connection.
 - 2) Blow out system with pressurized air, turning on each valve until water is cleared out of system. Run through system twice. Only blow out components suitable to receive pressurized air. Do not use excessive air pressure that will damage pipes and parts.
 - 3) Turn controller off.
 - 4) Open all manual drain valves.
 - 5) Check sprinkler heads to make sure they are below sidewalk and curb levels and not vulnerable to snowplow damage. Lower heads to proper elevation.
 - 6) Notify Owner's Representative when system has been turned off.
 - b. Spring start-up shall include following:
 - 1) Close all manual valves.
 - 2) Turn on water source at point of connection.
 - 3) Verify that controller is operating properly
 - 4) Flush entire system. Run each valve for two (2) minutes to check for damage, leaks, and coverage.
 - 5) Repair and adjust system as needed. Fine tune heads for efficient coverage.
 - 6) Notify Owner's Representative when system has been charged and is in full repair.

END OF SECTION

SECTION 32 9001**COMMON PLANTING REQUIREMENTS****1. GENERAL****1. SUMMARY**

- A. Includes But Not Limited To:
 - 1. Common procedures and requirements for landscaping work.
 - 2. Provide maintenance for new landscaping as described in Contract Documents.
- B. Related Requirements:
 - 1. Pre-Installation conferences held jointly with Section 32 9001 as described in Administrative Requirements on Part 1 of this specification section:
 - 2. Section 01 4301: 'Quality Assurance – Qualifications'.
 - 3. Section 31 0501: 'Common Earthwork Requirements'.
 - 4. Section 31 1100: 'Clearing and Grubbing'.
 - 5. Section 31 2213: 'Rough Grading'.
 - 6. Section 31 2216: 'Fine Grading'.
 - 7. Section 31 2316: 'Excavation'.
 - 8. Section 31 2323: 'Fill'.
 - 9. Section 32 8423: 'Underground Sprinklers'.
 - 10. Section 32 9121: 'Topsoil Physical Preparation'.
 - 11. Section 32 9122: 'Topsoil Grading'.
 - 12. Section 32 9223: 'Sodding'.
 - 13. Section 32 9300: 'Plants'.

2. REFERENCES

- A. Definitions:
 - 1. Plant Establishment Period: Time required for plants to successfully develop root systems into surrounding soil. Following this period, irrigation run times are typically modified. For purposes of this contract, the plant establishment period is assumed to be one (1) year from date of Substantial Completion.

3. ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in pre-installation conference as specified in Section 01 3100 and held jointly with following sections:
 - a. Section 32 8423: 'Underground Sprinklers'.
 - b. Section 32 9120: 'Topsoil And Placement'.
 - c. Section 32 9121: 'Topsoil Physical Preparation'.
 - d. Section 32 9122: 'Topsoil Grading'.
 - e. Section 32 9223: 'Sodding'.
 - f. Section 32 9300: 'Plants'.
 - g. Landscape Maintenance:
 - 1) Establish responsibility for maintenance of new landscaping during all phases of construction period.

4. SUBMITTALS

- A. Informational Submittals:

1. Certificates:
 - a. Provide certificate acknowledging 'Plant Establishment Period' commencement:
 - 1) Certificate will include name and signature of Contractor, Contractor's company, Contractor's telephone number, and date.
 - 2) Certificate will include name and signature of Owner's Representative, Owner's Representative's Group name, Owner's Representative Group telephone number, and date.
 - 3) Certificate will acknowledge date when Establishment Period begins and that it extends one (1) year from that time.
 2. Special Procedure Submittals:
 - a. Installer to provide two (2) copies of following recommendations to be included in Closeout Submittals:
 - 1) Landscape maintenance recommendations.
 - 2) Individual landscape maintenance recommendations.
 - 3) Plant establishment maintenance recommendations.
 - 4) Post-plant establishment maintenance recommendations.
- B. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800 (combine with sections of 32 8000 and sections of 32 9000 if applicable):
 - a. Record Documentation:
 - 1) Submit one (1) copy certificate for 'Plant Establishment Period' acknowledgement.
 - 2) Submit one (1) copy of recommendations specified in Special Procedure Submittals.
 - 3) Record Drawings:
 - a) As installation occurs, prepare accurate record drawings. Submit one (1) full size copy prior to final inspection. Drawing shall include:
 - (1) Detail and dimension changes made during construction.
 - (2) Take dimensions from permanent constructed surfaces or edges located at or above finish grade.

5. QUALITY ASSURANCE

- A. Regulatory Agency Sustainability Approvals:
1. Post-Emergent Weed Control:
 - a. Products shall be recognized for intended use by AHJ.
 - b. Work and materials shall be in accordance with latest rules and regulations, and other applicable state or local laws.
 - c. Nothing in Contract Documents is to be construed to permit work not conforming to these codes.:
 2. Installer:
 - a. Planting shall be performed under direction of foreman or supervisor with minimum three (3) years experience in landscape installations similar in size, scope, and complexity.
 - b. Foreman or supervisor required to attend pre-installation conference.
 - c. Use trained personnel familiar with required planting procedures and with Contract Documents.

6. DELIVERY, STORAGE, AND HANDLING

- A. Storage And Handling Requirements:
1. Deliver packaged materials in containers showing weight, analysis, and name of Manufacturer.
 2. Deliver sod, plants, trees, and shrubs in healthy and vigorous condition.
 3. Protect materials from deterioration during delivery.
- B. Storage And Handling Requirements:
1. Store in location on site where they will not be endangered and where they can be adequately watered and kept in healthy and vigorous condition.
 2. Protect materials from deterioration while stored at site.

2.PRODUCTS

1. POST-EMERGENT WEED CONTROL

- A. Type Two Acceptable Products:
 - 1. Enide by Upjohn.
 - 2. Dymid by Elanco.
 - 3. Treflan or Surflan by Dow Agrosiences.
 - 4. Eptan by Syngenta.
 - 5. Equal as approved by Architect before use. See Section 01 6200.

3.EXECUTION

1. INSTALLERS

- A. Acceptable Installers:
 - 1. Meet Quality Assurance Installer Qualifications as specified in Part 1 of this specification.

2. EXAMINATION

- A. Verification Of Conditions:
 - 1. Inspect site and Contract Documents to become thoroughly acquainted with locations of irrigation, ground lighting, and utilities.

3. PREPARATION

- A. Before proceeding with work, verify dimensions and quantities. Report variations between Drawings and site to Architect before proceeding with landscape work.
 - 1. Plant totals are for convenience of Contractor only and are not guaranteed. Verify amounts shown on Drawings.
 - 2. All planting indicated on Contract Documents is required unless indicated otherwise.
- B. Protection:
 - 1. Take care in performing landscaping work to avoid conditions that will create hazards. Post signs or barriers as required.
 - 2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.
 - 3. Keep site well drained and landscape excavations dry.

4. INSTALLATION

- A. Interface With Other Work:
 - 1. Do not plant trees and shrubs until major construction operations are completed. Do not commence landscaping work until work of Section 31 2216 and Section 32 8423 has been completed and approved.
- B. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.
- C. Hand excavate as required.
- D. Maintain grade stakes until parties concerned mutually agree upon removal.

- E. When conditions detrimental to plant growth are encountered, such as rubble fill or adverse drainage conditions, notify Architect before planting.

5. FIELD QUALITY CONTROL

- A. Field Inspection:
 - 1. Landscape Architect will inspect landscaping installation at Substantial Completion.
- B. Non-Conforming Work. Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
 - 1. Replace landscaping that is dead or appears dead as directed by Landscape Architect within ten (10) days of notification and before Substantial Completion at no additional cost to Owner.
 - 2. Replace damaged plantings at no additional cost to Owner.
 - 3. Repair damage to irrigation, ground lighting, utilities, asphalt paving, concrete paving, concrete sidewalks, concrete curb and gutters and other items adjacent to landscaping caused by work of this Section or replace at no additional cost to Owner.

6. CLEANING

- A. Waste Management:
 - 1. Immediately clean up soil or debris spilled onto pavement and dispose of deleterious materials.

7. CLOSEOUT ACTIVITIES

- A. Instruction Of Owner:
 - 1. Include following training:
 - a. Review Maintenance as specified at the end of this specification.
 - 2. Establishment Period Acknowledgement (coordinate with 32 8000 section):
 - a. Landscape Architect will acknowledge Establishment Period commencement.

8. PROTECTION

- A. Protect planted areas against traffic or other use immediately after planting is completed by placing adequate warning signs and barricades.
- B. Provide adequate protection of planted areas against trespassing, erosion, and damage of any kind. Remove this protection after Architect has accepted planted areas.

9. MAINTENANCE

- A. General:
 - 1. Before beginning maintenance period, plants shall be in at least as sound, healthy, vigorous, and in approved condition as when delivered to site, unless accepted by Architect in writing at final landscape inspection.
 - 2. Maintain landscaping from completion of landscape installation to thirty (30) days after Substantial Completion Meeting. Areas sodded or seeded after November 1st will accepted following spring approximately one (1) month after start of growing season, May 1st or as determined by Architect, if specified conditions have been met.
 - 3. Replace landscaping that is dead or appears unhealthy or non-vigorous as directed by Architect before end of maintenance period. Make replacements within ten (10) days of notification. Lawn that does not live and has to be replaced shall be guaranteed and maintained an additional thirty (30) days from date of replacement.
- B. Sodded Lawn:

1. Maintain sodded lawn areas until lawn complies with specified requirements and throughout maintenance period.
 2. Water sodded areas in sufficient quantities and at required frequency to maintain sub-soil immediately under sod continuously moist 3 to 4 inches deep.
 3. Cut grass first time when it reaches 3 inches high. Continue to mow at least once each week throughout maintenance period. Remove clippings.
 4. Apply weed killer as necessary to maintain weed-free lawn. Apply weed killer in accordance with manufacturer's instructions during calm weather when air temperature is between 50 and 80 deg F.
 5. At end of thirty (30) day maintenance period, fertilize lawns as recommended in Section 32 9113.
- C. Trees, Shrubs, And Plants:
1. Maintain by pruning, cultivating, and weeding as required for healthy growth.
 2. Restore planting basins.
 3. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical positions as required.
 4. Spray as required to keep trees and shrubs free of insects and disease.
 5. Provide supplemental water by hand as needed in addition to water from sprinkling system.

END OF SECTION

SECTION 32 9121**TOPSOIL PHYSICAL PREPARATION****1.GENERAL****1. SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform soil preparation work as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 31 0501: 'Common Earthwork Requirements' for common site construction requirements.
 - a. General procedures and requirements for earthwork.
 - 2. Section 31 1413: 'Topsoil Stripping And Stockpiling'.
 - 3. Section 31 2213: 'Rough Grading'.
 - 4. Section 32 9001: 'Common Planting Requirements':
 - a. Pre-installation conference held jointly with other common planting related sections.
 - 5. Section 32 9120: 'Topsoil And Placement' for topsoil evaluation and placement required for topsoil grading.
 - 6. Section 32 9122: 'Topsoil Grading' for preparation of topsoil and addition of amendments prior to landscaping.

2. ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in pre-installation conference as specified in Section 32 9001.
 - 2. In addition to agenda items specified in Section 01 3100, review the following:
 - a. Review physical soil amendments.

2.PRODUCTS**1. MATERIALS**

- A. Physical Soil Amendments:
 - 1. Incorporate soil amendments if required by Topsoil Testing Report analysis into topsoil used for Project:

3.EXECUTION**1. PERFORMANCE**

- A. Physical Soil Amendments:
 - 1. Add specified soil amendments at specified rates to topsoil as directed by Soil Testing Laboratory.
 - 2. Roto-till or otherwise mix amendments evenly into topsoil.

END OF SECTION

SECTION 32 9122**TOPSOIL GRADING****1. GENERAL****1. SUMMARY**

- A. Includes But Not Limited To:
 - 1. Perform topsoil grading required to prepare site for installation of landscaping as described in Contract Documents.
 - 2. Perform topsoil placement and finish grading work required to prepare site for installation of landscaping as described in Contract Documents.
 - 3. Furnish and apply soil amendments as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 31 0501: 'Common Earthwork Requirements':
 - 2. Section 31 1413: 'Topsoil Stripping And Stockpiling' for stripping and storing of existing topsoil.
 - 3. Section 31 2216: 'Fine Grading' for landscaping and planting areas.
 - 4. Section 32 9001: 'Common Planting Requirements':
 - a. Pre-installation conference held jointly with other common planting related sections.
 - 5. Section 32 9120: 'Topsoil And Placement' for topsoil evaluation and placement required for topsoil grading.
 - 6. Section 32 9121: 'Topsoil Physical Preparation' for physical preparation of topsoil (section included based on 'Topsoil Testing Report').

2. ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in pre-installation conference as specified in Section 32 9001.
 - 2. In addition to agenda items specified in Section 01 3100, review the following:
 - a. Review compost requirements to be within acceptable range as per Attachment 'Compost Quality Guidelines For Landscaping' and 'Compost Verification Report' in this specification.
 - b. Review soil fertility amendments and fertilizer requirements as per Attachment 'Topsoil Testing Report' in Section 32 9120.

3. SUBMITTALS

- A. Action Submittals:
 - 1. Material Data:
 - a. Soil Amendments and Fertilizer:
 - 1) Product literature and chemical / nutrient analysis of soil amendments and fertilizers.
 - 2) Proposed application rates necessary to bring topsoil up to specified requirements.
 - 3) Source location of products.
 - 4) Submit to Landscape Architect for approval prior to installation.
 - 2. Samples:
 - a. Soil Fertility Amendments and Fertilizer:
 - 1) Soil conditioner sample for approval before delivery to site.
 - 2) Product analysis.
- B. Informational Submittals:
 - 1. Testing And Evaluation Reports:
 - a. 'Compost Verification Report':
 - 1) Provide signed copy certifying that compost meets requirements of this specification.

2. Field Quality Control Submittals:
 - a. Soil Fertility Amendments and Fertilizer:
 - 1) Delivery slips indicating amount of soil amendments, compost, conditioner, and fertilizer delivered to Project site.
- C. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Submit 'Compost Verification Report'.
 - 2) Submit delivery slips indicating amount of physical amendments delivered to Project site.

2.PRODUCTS

1. MATERIALS

- A. Soil Amendments:
 1. Incorporate soil amendments into topsoil used for Project:
 - a. Acceptable Soil Amendments, Soil Conditioners, And Application Rates.
 - 1) 'Compost': at rate recommended by Topsoil Testing Report and no less than 3 cubic yards per 1,000 sq. ft. of surface area.
 - b. Acceptable Fertilizers And Application Rates:
 - 1) 16-16-8 at the rate of 10 lbs. per 1,000 sq. ft. of surface area.

3.EXECUTION

1. EXAMINATION

- A. Verification Of Conditions:
 1. Do not commence work of this Section until imported, stockpiled and in place topsoil are placed as specified in Section 32 9120 'Topsoil And Placement'.

2. PREPARATION

- A. Protection Of In-Place Conditions:
 1. Protect utilities and site elements from damage.
- B. Surface Preparation:
 1. Surfaces that meet specified topsoil elevations.
 - a. Seven (7) days maximum before beginning seeding and planting:
 - 1) Loosen topsoil 6 inch deep, dampen thoroughly, and cultivate to properly break up clods and lumps.
 - 2) Rake area to remove clods, rocks, weeds, roots, debris or other material 1-1/2 inches or more in any dimension.
 - 3) Grade and shape landscape area to bring surface to true uniform planes free from irregularities and to provide drainage and proper slope to catch basins.
 2. Addition of Soil Amendments:
 - a. Add specified soil amendments at specified rates to topsoil as directed by Topsoil Testing Report found in Section 32 9120 'Topsoil And Placement'.
 - b. Add specified fertilizers at specified rates into topsoil as directed by Soil Testing Laboratory.
 - c. Roto-till or otherwise mix soil amendments evenly into topsoil.

3. PERFORMANCE

- A. General:
 - 1. Limit use of heavy equipment to areas no closer than 6 feet from building or other permanent structures. Use hand held tillers for preparation of subsoil in areas closer than 6 feet.
 - 2. Do not expose or damage existing shrub or tree roots.
- B. Finish Grade Tolerances (As shown on General Planting Details in Contract Documents):
 - 1. Finish topsoil grade of planting areas before planting and after addition of soil additives shall be specified distances below top of adjacent pavement of any kind:
 - a. Ground Cover Areas: 2 inches below.
 - b. Sodded Areas: 2 inches below.
 - c. Tree and Shrub Areas (not individual trees): 4 inches below.
- C. Placed Topsoil:
 - 1. At locations where topsoil has been placed as per Section 32 9120 'Topsoil And Placement', perform the following:
 - a. Remove existing vegetation as required in preparation for new landscaping.
 - b. Remove organic material, rocks and clods greater than 1-1/2 inch in any dimension, and other objectionable materials.
- D. Grading:
 - 1. Coordinate grading as described in Section 32 9120 'Topsoil And Placement'.
- E. Immediately before planting lawn and with topsoil in semi-dry condition, roll areas that are to receive lawn in two directions at approximately right angles with water ballast roller weighing 100 to 300 lbs, depending on soil type.
- F. Rake or scarify and cut or fill irregularities that develop as required until area is true and uniform, free from lumps, depressions, and irregularities.

4. PROTECTION

- A. After landscape areas have been prepared, take no heavy objects over them except lawn rollers.

END OF SECTION

ATTACHMENTS

COMPOST QUALITY GUIDELINES FOR LANDSCAPING

[Source: Von Isaman MS, President of QA Consulting and Testing LLC, Dr. Rich Koenig, USU Cooperative Extension Soils Specialist, and Dr. Teresa Cerny, USU Cooperative Extension Horticulturalist, 3 March 2003]

Category	pH ^a	Soluble Salts ^a dS/m or mmho/cm	Sodium Adsorption Ratio ^a (SAR)	Carbon Nitrogen Ratio ^b (C:N)	Percent Moisture ^c	≥ 98 percent Coarse Material Passing (dry wt basis)
Ideal	6 to 8	≤ 5	< 10	≤ 20:1	25 to 35	3/8 inch (9.5 mm)
Acceptable	5-6, 8-9	≤ 10	≤ 20	21:1 to 30:1	< 25, > 35	3/4 inch (19 mm)
Suspect	< 5, > 9	> 10	> 20	<10:1, > 30:1	< 20, > 50	< 98 percent 3/4 inch (19 mm)

^a 1.5 Compost: Water Slurry on Coarse Material passing 3/8 inch (9.5 mm).

^b on Coarse Material passing 3/8 inch (9.5 mm).

^c on Total Sample

For composts with biosolid feedstocks, biosolids must meet EPA 503 Class A standard.

Acceptable level Soluble Salts and/or SAR composts should not exceed 3 cu yds (2.29 cu m) /1,000 sq ft (93 sq m) for every 3 inches (76 mm) of soil depth.

COMPOST VERIFICATION REPORT

	pH ^a	Soluble Salts ^a dS/m or mmho/cm	Sodium Adsorption Ratio ^a (SAR)	Carbon Nitrogen Ratio ^b (C:N)	Percent Moisture ^c	≥ 98 percent Coarse Material Passing (dry wt basis)
Results						

See Compost Quality Guidelines for Landscaping for footnote references.

I hereby certify that the Compost meets Ideal or Acceptable requirements as set forth in COMPOST QUALITY GUIDELINES FOR LANDSCAPING as listed with the COMPOST VERIFICATION STATEMENT. If Compost does not fall within this range, explain why and justify.

Signature: _____ Printed Signature: _____

Date: _____

SECTION 32 9223**SODDING****1. GENERAL****1. SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install sodded lawn as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 32 8423: Irrigation system.
 - 2. Section 32 9001: Common Planting Requirements:
 - a. Pre-installation conference held jointly with other common planting related sections.
 - 3. Section 32 9120: 'Topsoil And Placement'.
 - 4. Section 32 9121: 'Topsoil Physical Preparation' (section included based on Topsoil Testing Report).
 - 5. Section 32 9122: 'Topsoil Grading'.

2. REFERENCES

- A. Definitions:
 - 1. Crop Coefficients and Hydro-Zones: Crop coefficients (Kc) are used with ETo to estimate specific plant evapotranspiration rates. The crop coefficient is a dimensionless number (between 0 and 1.2) that is multiplied by the ETo value to arrive at a plant ET (ETc) estimate. Plants grouped by water needs, organized into one irrigation zone.
 - 2. Eco-Region Irrigation Design: A bio-regional approach to irrigation and planting design that is relevant to the geographic area for which the planting plan and irrigation system is designed. These geographic areas are defined by the Environmental Protection Agency and have been modified by the LDS church into 15 geographical areas throughout North America, and the Hawaiian Islands.
 - 3. Hardiness Zone: A hardiness zone is a more precisely geographically-defined zone within an Eco-Region in which a specific category of plant life is capable of growing, as defined by temperature hardiness, or ability to withstand the minimum temperatures of the zone. Hardiness Zones may be defined by one of two sources:
 - a. Sunset Western Garden Book Maps.
 - b. USDA Hardiness Zone Map.Plant Hardiness zone sources shall be listed by the architect through the planting and irrigation design process.
 - 4. Hydro-Zone: Plants grouped by water needs (similar Crop Coefficients (Kc), organized into one irrigation zone.
 - 5. Reference Evapotranspiration (ETo): The total water lost from the soil (evaporation) and from the plant surface (transpiration) over some period.

3. ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
 - 1. Participate in pre-installation conference as specified in Section 32 9001.

4. SUBMITTALS

- A. Informational Submittals:

1. Certificates:
 - a. Written certification confirming sod seed mix and quality:
 - 1) Include all species used.
 - 2) Include name and contact information of supplier.
- B. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Record Documentation:
 - 1) Submit one (1) copy certificate for sod seed quality and mix.

5. DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 1. Harvest, deliver, store, and handle sod in accordance with requirements of Turfgrass Producers International (TPI) (formally American Sod Producers Association) Specifications for Turfgrass Sod Materials and Transplanting / Installing.
 2. Schedule deliveries to coincide with topsoil operations and laying. Keep storage at job site to minimum without causing delays.
 - a. Deliver, unload, and store sod on pallets within 24 hours of being lifted.
 - b. Do not deliver small, irregular, or broken pieces of sod.
- B. Storage And Handling Requirements:
 1. Cut sod in pieces approximately 3/4 to one inch thick. Roll or fold sod so it may be lifted and handled without breaking or tearing and without loss of soil.
 2. During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.
 3. During dry weather, protect sod from drying before installation. Water as necessary to insure vitality and to prevent excess loss of soil in handling. Sod that dries out before installation will be rejected.

2.PRODUCTS

1. MATERIALS

- A. Description:
 1. Superior sod grown from certified, high quality, seed of known origin or from plantings of certified grass seedlings or stolons:
 - a. Assure satisfactory genetic identity and purity.
 - b. Assure over-all high quality and freedom from noxious weeds or an excessive amount of other crop and weedy plants at time of harvest.
 2. Sod shall be composed of three varieties minimum of Kentucky Bluegrass.

3.EXECUTION

1. INSTALLATION

- A. Interface With Other Work:
 1. Do not commence work of this Section until work of Sections 32 9122 and 32 9300 has been completed and approved.
- B. Tolerances:
 1. Final grade of soil after sodding of lawn areas is complete shall be one inch below top of adjacent pavement of any kind.
- C. Laying of Sod:

1. Lay sod during growing season and within 48 hours of being lifted.
 2. Lay sod while top 6 inches of soil is damp, but not muddy. Sodding during freezing temperatures or over frozen soil is not acceptable.
 3. Lay sod in rows perpendicular to slope with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with a sharp knife.
 4. Lay sod flush with adjoining existing sodded surfaces.
 5. Do not sod slopes steeper than 3:1. Consult with Architect for alternate treatment.
- D. After Laying of Sod Is Complete:
1. Roll horizontal surface areas in two directions perpendicular to each other.
 2. Repair and re-roll areas with depressions, lumps, or other irregularities. Heavy rolling to correct irregularities in grade will not be permitted.
 3. Water sodded areas immediately after laying sod to obtain moisture penetration through sod into top 6 inches of topsoil.

2. FIELD QUALITY CONTROL

- A. Field Inspection:
1. Sodded areas will be accepted at Project closeout if:
 - a. Sodded areas are properly established.
 - b. Sod is free of bare and dead spots and is without weeds.
 - c. No surface soil is visible when grass has been cut to height of 2 inches.
 2. Sodded areas have been mowed a minimum of twice.

END OF SECTION

SECTION 32 9300**PLANTS****1. GENERAL****1. SUMMARY**

- A. Includes But Not Limited To:
 - 1. Furnish and install landscaping plants as described in Contract Documents.
- B. Related Requirements:
 - 1. Section 32 8423: 'Underground Sprinklers' for irrigation system.
 - 2. Section 32 9001: 'Common Planting Requirements' for:
 - a. Pre-installation conference held jointly with other common planting related sections.
 - 3. Section 32 9120: 'Topsoil And Placement'.
 - 4. Section 32 9121: 'Topsoil Physical Preparation' (section included based on Topsoil Testing Report).
 - 5. Section 32 9122: 'Topsoil Grading'.
 - 6. Section 32 9223: 'Sodding'.

2. REFERENCES

- A. Definitions:
 - 1. Crop Coefficients and Hydro-Zones: Crop coefficients (Kc) are used with ETo to estimate specific plant evapotranspiration rates. Crop coefficient is dimensionless number (between 0 and 1.2) that is multiplied by ETo value to arrive at plant ET (ETc) estimate. Plants grouped by water needs, organized into one irrigation zone.
 - 2. Eco-Region Irrigation Design: Bio-regional approach to irrigation and planting design that is relevant to geographic area for which planting plan and irrigation system is designed. These geographic areas are defined by Environmental Protection Agency and have been modified by the LDS Church into 15 geographical areas throughout North America, and Hawaiian Islands.
 - 3. Hardiness Zone: Hardiness zone is more precisely geographically-defined zone within an Eco-Region in which specific category of plant life is capable of growing, as defined by temperature hardiness, or ability to withstand minimum temperatures of zone. Hardiness Zones may be defined by one of two sources:
 - a. Sunset Western Garden Book Maps.
 - b. USDA Hardiness Zone Map.Plant Hardiness zone sources shall be listed by Landscape Architect through planting and irrigation design process.
 - 4. Hydro-Zone: Plants grouped by water needs (similar Crop Coefficients (Kc), organized into one irrigation zone.
 - 5. Landscape Management Plan (LMP): See Section 32 9001 for definition.
 - 6. Plant Establishment Period: See Section 32 9001 for definition.
 - 7. Reference Evapotranspiration (ETo): Total water lost from the soil (evaporation) and from plant surface (transpiration) over some period.
- B. Reference Standards:
 - 1. American Nursery & Landscape Association / American National Standards Institute:
 - a. ANLA / ANSI Z60.1-2004, 'American Standard for Nursery Stock.'

3. ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:

1. Participate in pre-installation conference as specified in Section 32 9001.

4. SUBMITTALS

- A. Action Submittals:
 1. Samples:
 - a. Top dressing mulch for approval before delivery to site.
- B. Closeout Submittals:
 1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
 - a. Operations And Maintenance Data:
 - 1) Submit one (1) copy of recommendations specified in Special Procedure Submittals.
 - b. Warranty Documentation:
 - 1) Include written warranty.

5. DELIVERY, STORAGE, AND HANDLING

- A. Delivery And Acceptance Requirements:
 1. Deliver trees, shrubs, ground covers, and plants after preparations for planting have been completed and install immediately.
 2. Do not prune before delivery, except as approved by Landscape Architect.
 3. Protect bark, branches, and root systems from sun scald, drying, whipping, and other handling and tying damage.
 4. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape.
 5. Provide protective covering during delivery.
- B. Storage And Handling Requirements;
 1. Handle balled stock by root ball or container. Do not drop trees and shrubs during delivery.
 2. If planting is delayed more than six hours after delivery, set planting materials in shade and protect from weather and mechanical damage.
 3. Set balled stock on ground and cover ball with soil, saw dust, or other acceptable material approved by Landscape Architect.
 4. Do not remove container-grown stock from containers before time of planting.
 5. Do not store plant material on pavement.
 6. Water root systems of trees and shrubs stored on site with fine spray. Water as often as necessary to maintain root systems in moist condition. Do not allow plant foliage to dry out.

6. WARRANTY

- A. Special Warranty:
 1. Provide written warranties as follows:
 - a. Warranty shrubs, ground covers, and vines to live and remain in strong, vigorous, and healthy condition for 90 days minimum from date of Final Acceptance and meet or exceed material standards set forth in Materials heading of Part 2 of this specification.
 - b. Warranty trees to live and remain in strong, vigorous, and healthy condition and meet or exceed material standards set forth in Materials heading of Part 2 of this specification for one year from date of Final Acceptance.
 - c. When trees are completely accepted at end of warranty period, remove staking.

2.PRODUCTS

1. MATERIALS

- A. Plants:

1. Conform to requirements of Plant List and Key on Contract Documents and to ANLA / ANSI Z60.1.
2. Nomenclature:
 - a. Plant names used in Plant List conform to 'Standardized Plant Names' by American Joint Committee on Horticultural Nomenclature except in cases not covered. In these instances, follow custom of nursery trade. Plants shall bear tag showing genus, species, and variety of at least 10 percent of each species delivered to site.
3. Quality:
 - a. Plants shall be sound, healthy, vigorous, free from plant disease, insect pests or their eggs, noxious weeds, and have healthy, normal root systems. Container stock shall be well established and free of excessive root-bound conditions.
 - b. Do not prune plants or top trees prior to delivery.
 - c. Plant materials shall be subject to approval by Landscape Architect as to size, health, quality, and character.
 - d. Bare root trees or shrubs are not acceptable.
 - e. Provide plant materials from licensed nursery or grower.
4. Measurements:
 - a. Measure height and spread of specimen plant materials with branches in their normal position as indicated on Contract Documents or Plant List.
 - b. Measurement should be average of plant, not greatest diameter. For example, plant measuring 15 inches in widest direction and 9 inches in narrowest would be classified as 12 inch stock.
 - c. Plants properly trimmed and transplanted should measure same in every direction.
 - d. Measure caliper of trees 6 inches above surface of ground.
 - e. Where caliper or other dimensions of plant materials are omitted from Plant List, plant materials shall be normal stock for type listed.
 - f. Plant materials larger than those specified may be supplied, with prior written approval of Landscape Architect, and:
 - 1) If complying with Contract Document requirements in all other respects.
 - 2) If at no additional cost to Owner.
 - 3) If sizes of roots or balls are increased proportionately.
5. Shape and Form:
 - a. Plant materials shall be symmetrical or typical for variety and species and conform to measurements specified in Plant List.
 - b. Well grown material will generally have height equal to or greater than spread. However, spread shall not be less than 2/3 of height.

2. ACCESSORIES

- A. Planting Mix:
 1. Mixture of three (3) parts excavated soil and one part well rotted composted manure, approved commercial mix, or other amendment recommended in 'Topsoil Testing Report'.
- B. Fertilizer:
 1. Fertilizer as recommended on 'Topsoil Testing Report'.
- C. Tree Stakes:
 1. Type Two Acceptable Products:
 - a. 2 inch diameter Lodgepole Pine, Douglas Fir, White Fir, or Hemlock Fir.
 - b. Equal as approved by Landscape Architect before installation. See Section 01 6200.
- D. Tree Staking Ties:
 1. Type Two Acceptable Products:
 - a. 32 inch Cinch-Tie tree ties by V.I.T. Products Inc, Escondido, CA www.vitproducts.com.
 - b. Equal as approved by Landscape Architect before installation. See Section 01 6200.
- E. Pre-Emergent Herbicide:
 1. Category Four Approved Products. See Section 01 6200 for definitions of Categories.

- a. Chipco Dimension Granular by The Andersons Inc, Maumee, IL www.andersonsinc.com.
- b. Elanco XL2G granular by Crop Data Management Systems, Marysville, CA www.cdms.net.
- c. Ronstar G granular by Bayer Crop Science, Monheim, Germany
www.bayercropscience.com.
- d. Surflan AS liquid by United Phosphorous Inc, Trenton, NJ www.upi-usa.com.
- e. Oryzalin 4 A.S. liquid by FarmSaver, Seattle, WA www.farmsaver.com.

F. Weed Barrier:

- 1. Type Two Acceptable Products:
 - a. DeWitt 4.1 oz 20 year woven polypropylene weed barrier.
 - b. Equal as approved by Landscape Architect before bidding. See Section 01 6200.

G. Rock Mulch:

- 1. Type Two Acceptable Products:
 - a. Equal to Black and Tan as available from Wolverine Mulch
 - 1) Size:
 - a) No rock should be less than 3/4 inch in size.
 - b) Size: 1-1/4" to 1-1/2".

3.EXECUTION

1. EXAMINATION

A. Evaluation And Assessment:

- 1. Before proceeding with work, check and verify dimensions and quantities. Report variations between Drawings and site to Landscape Architect before proceeding with work of this Section.
- 2. Plant totals are for convenience only and are not guaranteed. Verify amounts shown on Contract Documents. All planting indicated on Contract Documents is required unless indicated otherwise.
- 3. Do not commence with this Work until grading tolerances specified in Section 32 9122 'Topsoil Grading' are met.

2. PREPARATION

A. Plant Approval:

- 1. Compliance:
 - a. Prior to any plant installation, evaluate plants for compliance with material standards.
 - b. Remove plants from site that do not comply.

B. Layout individual shrub locations and areas for multiple plantings:

- 1. Stake locations and outline areas.
- 2. Secure Landscape Architect's acceptance before planting.
- 3. Make minor adjustments as may be requested.

3. INSTALLATION

A. Interface With Other Work:

- 1. Do not commence work of this Section until work of Section 32 9122 has been completed and approved.

B. Excavation:

- 1. If underground construction work or obstructions are encountered in excavation of planting holes, Landscape Architect will select alternate locations.
- 2. Plant Excavation Size:
 - a. Diameter: Twice diameter of root ball or container minimum.
 - b. Depth: Equal to container or rootball depth.

3. Unless excavated material meets topsoil requirements as specified in Section 32 9113, remove from landscape areas and do not use for landscaping purposes.
 4. Roughen sides and bottoms of excavations.
- C. Planting:
1. Removing Binders And Containers:
 - a. Remove plastic containers.
 2. Plant immediately after removing binding material and containers:
 - a. Shrub root balls shall be approximately one inch higher than finished grade.
 3. Properly cut off broken or frayed roots.
 4. Center plant in hole:
 - a. Replace damaged material.
 - b. Backfill with specified planting mix.
 - c. Except in heavy clay soils, make ring of mounded soil around hole perimeter to form watering basin.
 5. Add fertilizer in plant pit as per 'Topsoil Testing Report' and during proper season.
 6. Fill landscape excavations with tamped planting mix and recommended fertilizer:
 - a. Compact in 6 inch lifts.
 - b. Settle by watering to ensure top of root ball is 2 inches higher for trees and one inch higher for shrubs than surrounding soil following compaction and settling.
 7. Do not use muddy soil for backfilling.
 8. Make adjustments in positions of plants as directed by Landscape Architect.
 9. Thoroughly water shrubs immediately after planting.
- D. Post Planting Weed Control:
1. Apply specified pre-emergent herbicide to shrub and ground cover planting areas and grass-free areas at tree bases after completion of planting.
 2. Areas shall be weed free prior to final acceptance.
- E. Weed Barrier Fabric:
1. After planting and application of herbicide in shrub beds, apply covering of specified weed barrier fabric.
 2. Achieve 100 percent coverage over ground areas while allowing space for growth from root ball.
 3. Overlap seams 6 inches minimum.
 4. Staple at 5 feet on center each way and within 3 inches of edge of shrub bed, with two (2) at each corner.
- F. Mulching:
1. After application of herbicide, mulch shrub and ground cover planting areas with 3 inches deep layer of specified top dressing rock mulch.
 2. Place mulch to uniform depth and rake to neat finished appearance.

END OF SECTION