



FORT LEWIS COLLEGE®

DURANGO, COLORADO

FL2204 – SIDEWALK REPLACEMENT REQUEST FOR DOCUMENTED QUOTE

Bid #26111

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FORT LEWIS COLLEGE[®]
DURANGO, COLORADO

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Request for Documented Quote

State of Colorado
Fort Lewis College

Notice Number: 26111

Project Number: FL2204

Project Title: Sidewalk Replacement

Estimated Project Cost: 90,000.00

NOTICES

1. For all projects with a total dollar value above \$150,000 Notice of Final Settlement is required by C.R.S. §38-26-107(1). Final Settlement, if required, will be advertised in the same location as the original solicitation.
2. All respondents accept the conditions of this RFDQ, including but not limited to, the following:
 - a. All submittals shall become the property of the State of Colorado and will not be returned.
 - b. Late submittals shall not be evaluated.
 - c. The State reserves the right to reject any or all proposals on the basis of being unresponsive to this RFDQ or for failure to disclose requested information.
 - d. The State shall not be liable for any costs incurred by respondents in the preparation of submittals and proposals nor in costs related to any element of the selection and contract negotiation process.
3. The respondent has reviewed Appendix D and by responding has agreed that the terms and conditions of the sample Construction Purchase Order (SBP3.1 PO-OSA) are expressly workable without reservation. Any exceptions to the contract must be communicated formally in writing before the bid closes.
4. Preference shall be given to Colorado resident bidders and for Colorado labor, as provided by law.
5. Per C.R.S. §24-105-201 If the construction value is \$50,000 or greater a Bid Bond and Power of Attorney or Proposal Guaranty is required in an amount not less than 5% of the total Bid.

PROJECT OVERVIEW

Introduction

The State of Colorado, (Fort Lewis College) is soliciting bids from qualified contractors for the FL2204 – Sidewalk Replacement project. The project will remove and replace approximately 483 LF of 6' Sidewalk and replace with 8' wide 6" thick new concrete sidewalks.

In the summer of 2025 FLC installed a storm water drainage system, french drains and new sidewalk around Centennial 1000 and the east side of Centennial 2000. The bulk of the work has been completed, and we are looking to replace additional sidewalks before completing the final landscaping.

This work is expected to be completed in the early summer of 2026 between May 4 – May 15, 2026.

The project includes the following:

- Remove and dispose of approximately 483 LF of 6' wide asphalt and concrete sidewalks of estimated 6" thicknesses.
- Provide subgrade preparation for new 8' wide sidewalk with a thickened edge including subgrade scarification and re-compaction and the installation of compacted 6" thick Class 6 ABD road base.
- Form, pour, and finish approximately 483 LF of 8' wide 6" thick sidewalk, broom finish with tooled control joints
- Regrade surrounding area and bring fill dirt within 1" of top of new concrete.
- Coordinate sub grade compaction and concrete testing to be paid by FLC.

Contractor to field verify all quantities prior to bidding.

Scope of Services

The scope of services will include full Construction Contracting Services for the project specified during the process of construction and warranty period to the State as per the Advertisement for Bid. Specific tasks to be performed by the Contractor include those generally performed by the construction community where the Contractor is the prime vendor to the State. Bidders shall reference the drawings, specifications, and supporting documents in the Appendices for an understanding of the entire scope of the project.

Per C.R.S. §38-26-106, if a contract amounts to \$150,000 or more, the awarded contractor shall provide payment and performance bonds at the value of the contract. The costs associated with this bond are to be included in the contractor's bid.

MINIMUM REQUIREMENTS

Notice is hereby given to all interested parties that all firms will be required to meet all minimum requirements to be considered for this project. Interested bidders should be prepared to show evidence of the following to be considered as qualified, as a minimum:

1. Not previously terminated by the State for non-performance on a State Buildings contract or procurement.
2. The bidding contractor must have been in the same business, under the same name for the last two (2) years.
3. Demonstrated specific contracting experience in projects of similar scope and complexity for at least two (2) projects each in excess of \$50,000.00 (hard costs), utilizing the expertise present in their Colorado Office; and
4. Demonstrated bonding capability up to \$100,000 for an individual project coincidentally with current and anticipated workloads; provide letter from surety that affirms this capacity.

Firms meeting the minimum requirements may obtain the bidding documents on the website accompanying this advertisement:

www.bidnetdirect.com/Colorado and

Fort Lewis Purchasing webpage: www.fortlewis.edu/purchasing/opportunitiestobid

RE-BID CONFERENCE AND SITE TOUR

A Pre-Bid Meeting will be held at:

Building Address:	<u>385 Fort Lewis Drive</u>
Room:	<u>Physical Plant East Rm12 - Conference Room</u>
Date/Time	<u>3/18/26 - 2:00 PM</u>

SCHEDULE

The following is a tentative schedule of events for the Bid Submittal process and an outline of the schedule for the balance of the project. All dates are subject to change and changes in the schedule will be issued via addendum.

Advertisement for Bids Issued	<u>3/12/2026</u>
Pre-Bid Conference and Site Tour	<u>3/18/2026 – 2:00 PM</u>
Request for Clarifications Due	<u>3/23/2026 – 5:00 PM</u>
Final Addendum Issued (anticipated)	<u>3/25/2026</u>
Bid Submittals Due (date and Time)	<u>3/30/2026 – 2:30 PM</u>
Public Bid Opening	<u>3/30/2026 – 2:30 PM</u>
Award Intent Notification (anticipated)	<u>3/31/2026</u>
Contracting	<u>4/1/2026 – 4/10/2026</u>
Contract Approval (anticipated)	<u>4/10/2026</u>
Anticipated Construction Start	<u>5/4/2026</u>
Anticipated Construction Finish	<u>5/15/2026</u>

The above schedule is tentative. Responding firms shall be notified of revisions in a timely manner by email or posted on www.bidnetdirect.com/Colorado and www.fortlewis.edu/purchasing/opportunitiestobid websites. Respondents may elect to verify times and dates by email, but no earlier than 36 hours before the scheduled date and time.

QUESTIONS, CLARIFICATIONS AND ADDENDA

Owner initiated changes to this AFB will be issued under numerically sequenced addenda.

Owner initiated changes to this AFB will be posted in the form of addenda on www.bidnetdirect.com/Colorado and at: www.fortlewis.edu/purchasing/opportunitiestobid.

Questions and requests for clarifications regarding this project shall be submitted before the deadline listed in the above Schedule.

Communication regarding the project during the procurement, outside of the this submission process or scheduled procurement milestones is not permitted.

POINT OF CONTACT/CLARIFICATION

Name:	<u>Greg Yucha – Project Manager</u>
Agency:	<u>Fort Lewis College</u>
Email Address:	<u>gtyucha@fortlewis.edu</u>
Phone:	<u>970-382-0788</u>

BIDDING

Bids shall be submitted on the required bid form as indicated on the Information For Bidders document (SBP-6.12) in Appendix A.

An electronic copy of the sealed bid submittal is due 3/30/2026 and shall be received no later than 2:00 PM (MD/ST), and shall be submitted/accepted via email to gtyucho@fortlewis.edu

OR

One (1) hard copies of the sealed bid submittal are due 3/30/2026 and shall be received no later than 2:30 PM (MST), and shall be submitted/accepted at the following mailing address:

Fort Lewis College – Physical Plant Services
1000 Rim Drive
Durango Co 81301

Bid Forms and Appendices to be included with bid submittal:

Bid Form (SBP-6.13)
Bid Bond (SBP-6.14)

Late bid submittals will be rejected without consideration. The State of Colorado assume no responsibility for costs related to the preparation of bid submittals.

BID OPENING

Public bid opening will take place at the date and time identified in Schedule

APPENDICES:

Appendix B: Information for Bidders (SBP 6.12)
Appendix B1: Bid Form (SBP-6.13)
Appendix B3: Bid Bond (SBP-6.14) (if Applicable)
Appendix C: Sample: Direct Labor Burden Calculation (SBP-6.18)
Appendix D: Sample: SBP-3.1 Construction Purchase Order and State of Colorado Purchase Order Terms and Conditions



STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

INFORMATION FOR BIDDERS

Institution or Agency:

Project No./Project Name:

1. **BID FORM:** Bidders are required to use the Bid form attached to the solicitation. Each bidder is required to bid on all alternates and indicate the time from the date of the Notice to Proceed to Substantial Completion in calendar days. In addition, the bidder is required to indicate the period of time to finally complete the project from Substantial Completion to Final Acceptance, in calendar days. Bids indicating times for Substantial Completion and Final Acceptance in excess of the number of days indicated in the Advertisement for Bids for completion of the entire Project may be found non-responsive and may be rejected. The bid shall not be modified or conditioned in any manner. Bids and applicable bid security shall be submitted according to the following instructions:
2. **INCONSISTENCIES AND OMISSIONS:** Bidders may request clarification of any seeming inconsistencies, or matters seeming to require explanation, in the bidding documents at least three (3) business days prior to the time set for the opening of Bids. Decisions of major importance on such matters will be issued in the form of addendum.
3. **APPLICABLE LAWS AND REGULATIONS:** All work under this Contract shall comply with the provisions of all state and local laws, approved state building codes, ordinances and regulations which might in any manner affect the work to be done or those to be employed in or about the work. Labor for work shall be governed by the provisions of Colorado law which are hereinafter set forth in Articles 27 and 52 of the General Conditions. This includes the requirements for apprenticeship and prevailing wage on Public Projects. The bidder should be aware that reporting of embodied carbon emissions of eligible materials shall be governed by the provisions of Colorado State Law. This includes the requirements for Environmental Product Declarations (EPDs) that meet the maximum acceptable Global Warming Potential (GWP) limits as established by the Office of the State Architect.
4. **BID SECURITY:** A bid security of not less than 5% of the bid price is required when the price is estimated to be \$50,000 or more. The security shall be a bond by a surety company, the equivalent in cash, or otherwise supplied in a form

satisfactory for the State. Noncompliance requires the bid to be rejected as nonresponsive.

5. TAXES: The Bid submitted shall exclude all applicable federal excise or manufacturers' taxes and all state sales and use taxes as hereinafter set forth in Article 9.3 of the GENERAL CONDITIONS.
6. OR EQUAL: The words "OR EQUAL" are applicable to all specifications and drawings relating to materials or equipment specified. Any material or equipment that will fully perform the duties specified, will be considered "equal", provided the bid submits proof that such material or equipment is of equivalent substance and function and is approved, in writing. Requests for the approval of "or equal" shall be made in writing at least five (5) business days prior to bid opening. During the bidding period, all approvals shall be issued by the Architect/Engineer in the form of addenda at least two (2) business days prior to the bid opening date.
7. ADDENDA: Owner/architect initiated addenda shall not be issued later than two (2) business days prior to bid opening date. All addenda shall become part of the Contract Documents and receipt must be acknowledged on the Bid form.
8. METHOD OF AWARD - LOWEST RESPONSIBLE BIDDER: If the bidding documents for this project require alternate prices, additive and/or deductible alternates shall be listed on the alternates bid form provided by the Principal Representative. Bidders should note the Method of Award is applicable to this Bid as stated below.
 - A. DEDUCTIBLE ALTERNATES: The lowest responsible Bid, taking into account the Colorado resident bidder preference provision of Colorado law, will be determined by, and the contract will be awarded on the base bid combined with deductible alternates, accepted in numerical order as listed in the Bid Alternates Form provided by the Principal Representative. The subtraction of alternates shall result in a sum total within available funds. If this bid exceeds such amount, the right is reserved to reject all bids. An equal number of alternates shall be subtracted from the base bid of each bidder within funds available for purposes of determining the lowest responsible bidder.
 - B. ADDITIVE ALTERNATES: The lowest responsible Bid, taking into account the Colorado resident bidder preference provision of Colorado law, will be determined by and the contract will be awarded on the base bid combined with additive alternates in numerical order in as listed in the Bid Alternates Form provided by the Principal Representative. The addition of alternates shall result in a sum total within available funds. If this bid exceeds such amount, the right is reserved to reject all bids. An equal number of alternates shall be added to the base bid of each bidder within funds available for purposes of determining the lowest responsible bidder.
 - C. DEDUCTIBLE AND ADDITIVE ALTERNATES: Additive alternates will not be used if deductible alternates are used and deductible alternates will not be used if additive alternates are used.
9. NOTICE OF CONTRACTOR'S SETTLEMENT - Agencies/institutions must indicate in the initial Solicitation where settlement will be advertised in electronic media.



STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

BID FORM

Institution or Agency:

Project No./Project Name:

Bidder Acknowledges Receipt of Addenda Numbers: _____

(See 3a below for the next 3 items)

Bidder Anticipates Services outside the United States or Colorado:*	No	Yes
Bidder will comply with 80% Colorado Labor on project above \$500,000	No	Yes
Bidder is a Service-Disabled Veteran Owned Small Business:*	No	Yes

Base Bid \$ _____

Bidder's Time of Completion

Time Period from Notice to Proceed to Substantial Completion: _____

Time Period from Substantial Completion to Final Acceptance: _____

Total Time of Completion of Entire Project (a + b): _____

-
1. BID: Pursuant to the advertisement by the State of Colorado dated _____ the undersigned bidder hereby proposes to furnish all the labor and materials and to perform all the work required for the complete and prompt execution of everything described or shown in or reasonably implied from the Bidding Documents, including the Drawings and Specifications, for the work and for the base bid indicated above. Bidders should include all taxes that are applicable.
 2. EXAMINATION OF DOCUMENTS AND SITE: The bidder has carefully examined the Bidding Documents, including the Drawings and Specifications, and has examined the site of the Work, so as to make certain of the conditions at the site and to gain a clear understanding of the work to be done.
 3. PARTIES INTERESTED IN BID: The bidder hereby certifies that the only persons or parties interested in this Bid are those named herein, and that no other bidder or prospective bidder has given any information concerning this Bid.
 - a. If the bidder anticipates services under the contract or any subcontracts will be performed outside the United States or Colorado, the bidder shall provide in a written statement which must include, but need not be limited to the type of services that will be performed at a location outside the United States or Colorado and the reason why it is necessary or advantageous to go outside the United States or Colorado to perform such services. (Does not apply to any project that receives federal moneys) *

- b. For State Public Works projects per C.R.S. 8-17-101, Colorado labor shall be employed to perform at least 80% of the work. Colorado Labor means any person who is a resident of the state of Colorado at the time of the Public Works project. Bidders indicating that their bid proposal will not comply with the 80% Colorado Labor requirement are required to submit written justification along with the bid submission. (Does not apply to any project that receives federal moneys) *
 - c. A Service-Disabled Veteran Owned Small Business (SDVOSB) per C.R.S. 24-103-211, means a business that is incorporated or organized in Colorado or maintains a place of business or has an office in Colorado and is officially registered and verified by the Center for Veteran Enterprise within the U.S. Department of Veteran Affairs. Attach proof of certification along with the bid submission. *
 - d. Projects estimated to be \$1 million or more that do not receive federal funds are required to comply with the State Apprenticeship Utilization requirements C.R.S. 24-92-115
 - e. Projects estimated to be \$500,000 or more that do not receive federal funds are required to comply with the State Prevailing Wage requirements C.R.S. 24-92-201 through 210.
4. BID GUARANTEE: This Bid is accompanied by the required Bid Guarantee. Per C.R.S. §24-105-201 If the construction value is \$50,000 or greater a Bid Bond and Power of Attorney or Proposal Guaranty is required in an amount not less than 5% of the total Bid. You are authorized to hold said Bid Guarantee for a period of not more than thirty (30) days after the opening of the Bids for the work above indicated, unless the undersigned bidder is awarded the Contract, within said period, in which event the Office of the State Architect, may retain said Bid Guarantee, until the undersigned bidder has executed the required Agreement and furnished the required Performance Bond, Labor and Material Payment Bond, and Insurance Policy.
5. TIME OF COMPLETION: The bidder agrees to achieve Substantial Completion of the Project from the date of the Notice to Proceed within the number of calendar days entered above, and in addition, further agrees that the period between Substantial Completion and Final Acceptance of the Project will not exceed the number of calendar days noted above. If awarded the Work, the bidder agrees to begin performance within ten (10) days from the date of the Notice to Proceed subject to Article 46, Time of Completion and Liquidated Damages of the General Conditions of the Contract, and agrees to prosecute the Work with due diligence to completion. The bidder represents that Article 7D of the Contractor's Agreement (SC-6.21) has been reviewed to determine the type and amount of any liquidated damages that may be specified for this contract.
6. EXECUTION OF DOCUMENTS: The bidder understands that if this Bid is accepted, bidder must execute the required Agreement and furnish the required Performance Bond, Labor and Material Payment Bond, Insurance Policy and Certificates of Insurance within ten (10) days from the date of the Notice of Award, and that the bidder will be required to sign to acknowledge and accept the Contract Documents, including the Drawings and Specifications.
7. ALTERNATES: Refer to the Information for Bidders (SC-6.12) for Method of Award for Alternates and use State Form SBP-6.13.1 Bid Alternates form to be submitted with this bid form if alternates are requested by the institution/agency in the solicitation documents.

8. Submit wage rates (direct labor costs) for prime contractor and subcontractor as requested by the institution/agency in the solicitation documents.
9. The right is reserved to waive informalities and to reject any and all Bids.

*Does not apply to projects for Institutions of Higher Education that have opted out of the State Procurement Code.

SIGNATURES: If the Bid is being submitted by a Corporation, the Bid shall be signed by an officer, i.e., President or Vice-President. If a sole proprietorship or a partnership is submitting the Bid, the Bid shall so indicate and be properly signed.

Dated this _____ Day of _____, 20____

THE BIDDER:

By _____
Company Name

Address

Phone Number _____

City, State Zip Code

By _____
Name (Print) and Title

Signature



STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

BID BOND

Institution or Agency: Fort Lewis College

Project No./Project Name: FL2204 - Sidewalk Replacement

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, _____ hereinafter called the "PRINCIPAL", is submitting a PROPOSAL for the above described project, to the STATE OF COLORADO, hereinafter called the "OBLIGEE".

WHEREAS, the Advertisement for Bids has required as a condition of receiving the Proposals that the Principal submit with the PROPOSAL GUARANTY in an amount not less than five per cent (5%) of the Proposal, which sum it is specifically agreed is to be forfeited as Liquidated Damages in the event that the Principal defaults in his obligation as hereinafter specified, and, in pursuance of which Requirement, this Bid is made, executed and delivered.

NOW THEREFORE, the Principal and _____ a corporation of the State of _____, duly authorized to transact business in Colorado, as Surety, are held and firmly bound unto the Obligee, in the sum of five per cent (5%) of the Principal's total bid price, lawful money of the United States for the payment of which sum, well and truly to be made to the Obligee, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

FURTHER THAT, a condition of the obligation that the Principal shall maintain his Proposal in full force and effect for thirty (30) days after the opening of the proposals for the project, or, if the Principal's Proposal is accepted, the Principal shall, within the prescribed time, execute the required Agreement, furnish the required Performance Bond, Labor and Material Payment Bond, Insurance Policy, Certificates of Insurance and Certification and Affidavit Regarding Illegal Aliens, then this obligation shall be null and void, otherwise it shall remain in full force and effect, and subject to forfeiture upon demand as Liquidated Damages.

IN WITNESS WHEREOF said Principal and Surety have executed this Bond, this ____ day of _____, A.D., 20__.

(Corporate Seal)

THE PRINCIPAL

ATTEST

By _____
Name (Print)

Company Name

Address

City, State Zip Code

Signature

Name (Print) and Title

If the "Principal" is doing business as a Corporation, the Bid Bond shall be signed by an officer, i.e., President or Vice President. The signature of the officer shall be attested to by the Secretary and properly sealed.

If the "Principal" is an individual or a partnership, the Bid Bond shall so indicate and be properly signed.

(Corporate Seal)

THE SURETY

Secretary

By _____
Attorney-in-Fact

THIS BOND MUST BE ACCOMPANIED BY POWER OF ATTORNEY, EFFECTIVELY DATED.

FAILURE TO PROVIDE A PROPERLY EXECUTED BID BOND WITH A PROPERLY EXECUTED POWER OF ATTORNEY WILL RESULT IN THE BIDDER'S PROPOSAL BEING DEEMED NON-RESPONSIVE.



STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

DIRECT LABOR BURDEN CALCULATION

Institution/Agency: Fort Lewis College

Project No./Name: FL2204 – Sidewalk Replacement

This form is required to be submitted for review prior to execution of a construction agreement.

List items below by the percentage of what makes up the total labor overhead; Items include benefits that a contractor pays to employees on their payroll. Examples include taxes, pension cost, health and dental insurance etc. The Labor Burden percentage must be agreed to by both the contractor and Principal Representative and will be included in the contract as part of Exhibit A and will be used in the calculation of any future Change Order Proposals (SC-6.312) Line 2.

Major sub-contractors defined as electricians, plumbers, mechanical contractors, excavators, millwork, concrete, block layers etc. Please provide one (1) Labor Burden Calculation Sheet per contractor and for each sub-contractor. These labor burdens shall be used in the calculation of any future Change Order Proposals (SC-6.312) Line 10.

State reserves the right to require back-up confirmation of all information included in this calculation.

Contractor/Subcontractor Name:		
	Percent of Salary Paid	
Payroll Taxes		
Pension Costs		
Health Insurance		
Dental Insurance		
Life Insurance		
Other (Specify)		Description: _____
Other (Specify)		Description: _____
Total Labor Burden Percentage:	0%	



Construction Purchase Order

Instructions to Contractor:

1. **Important:** The Purchase Order (PO) number and Accounting Code must appear on all invoices and correspondence.
2. If for any reason, delivery of this order is delayed beyond the delivery/installation date shown, please notify the **agency contact** listed below. (Right of cancellation is reserved in instances in which timely delivery is not made.)
3. All chemicals, equipment and materials must conform to the standards required by OSHA.
4. State of Colorado Purchase Order Terms and Conditions can be found on the [Office of the State Controller Website](https://osc.colorado.gov) (<https://osc.colorado.gov>).
5. This form and all invoices must be signed by the contractor.

Purchase Order # _____ Page # _____

Agency Letters: _____ Project Number: _____

Buyer Information

Buyer Name: _____ Email: _____

Agency Contact: _____ Phone: _____

Contractor Information

Contact Name: _____

Phone: _____ Email: _____

FEIN: _____

Purchase Requisition # _____

Contractor Name: _____

Address (line 1) _____

Address (line 2) _____

City _____ State _____ Zip _____

Payment Information

Accounting Code # _____ Line # _____

Invoices to: _____

Address (line 1) _____

Address (line 2) _____

City _____ State _____ Zip _____

Ship to: _____

Address (line 1) _____

Address (line 2) _____

City _____ State _____ Zip _____

Delivery/Installation Date: _____ F.O.B.: _____

Line Item	Commodity or Item Code	Unit of Measure	Qty.	Unit Cost	Total Item Cost

Total Cost: _____

Signatures

Contractor: _____ Date: _____

Principal Representative
of Institution/Agency: _____ Date: _____

DPA State Buildings
Program or Authorized
Delegate: _____ Date: _____

State Controller or
Authorized Delegate: _____ Date: _____

This PO is issued in accordance with state and federal regulations for the State of Colorado.

State of Colorado Purchase Order Terms and Conditions

- 1. Offer/Acceptance.** This Purchase Order, together with these terms and conditions (including, if applicable, Addendum 1: Additional Terms and Conditions for Information Technology, below), and any other attachments, exhibits, specifications, or appendices, whether attached or incorporated by reference (collectively the "PO") shall represent the entire and exclusive agreement between the State and the Vendor. If this PO refers to Vendor's bid or proposal, this PO is an ACCEPTANCE of Vendor's OFFER TO SELL in accordance with the terms and conditions of this PO. If a bid or proposal is not referenced, this PO is an OFFER TO BUY, subject to Vendor's acceptance, demonstrated by Vendor's performance or written acceptance of this PO. Any COUNTER-OFFER TO SELL automatically CANCELS this PO, unless a change order accepting the counter-offer is issued in accordance with §4 accepting a counter-offer. The State shall not be responsible or liable for goods or services delivered or performed prior to issuance of this PO.
- 2. Order of Precedence.** In the event of a conflict or inconsistency within this PO, such conflict or inconsistency shall be resolved by giving preference to the documents in the following order of priority: **(a)** the Purchase Order document; **(b)** these Terms and Conditions (including, if applicable, Addendum 1: Additional Terms and Conditions for Information Technology below); and **(c)** any attachments, exhibits, specifications, or appendices, whether attached or incorporated by reference. Any terms and conditions included on Vendor's forms or invoices not included in this PO are void.
- 3. Safety Information.** All chemicals, equipment, and materials proposed or used in the performance of this PO shall conform to the requirements of the Occupational Safety and Health Act of 1970. Vendor shall furnish all Material Safety Data Sheets (MSDS) for any regulated chemicals, equipment, or hazardous materials at the time of delivery.
- 4. Changes.** Vendor shall furnish goods or services in strict accordance with the specifications and price set forth for each item. This PO shall not be modified, superseded or otherwise altered, except in writing signed by the State and accepted by Vendor. If this PO is for goods only and Vendor has not delivered the goods prior to the expiration of this PO, but Vendor delivers all of the goods to the State only after expiration of this PO, then the State, in its sole discretion, may accept the goods under this PO by extending this PO and delivering the modification to Vendor; however, regardless of anything to the contrary, if the State does not extend this PO for any reason then the goods delivered after expiration of this PO shall be deemed rejected, Vendor shall arrange the return of all delivered goods at Vendor's sole expense, and the State shall have no liability for any such goods.
- 5. Delivery.** Unless otherwise specified in this PO, delivery shall be FOB destination, freight prepaid and allowed. The State is relying on the promised delivery date and any installation or service performance set forth in this PO as material and basic to the State's acceptance. If Vendor fails to deliver or perform as and when promised, the State, in its sole discretion, may cancel its order, or any part thereof, without prejudice to its other rights, return all or part of any shipment so made, and charge Vendor with any loss or expense sustained as a result of such failure to deliver or perform as promised. Time is of the essence.
- 6. Rights to Materials.** *[Not Applicable to POs issued either in whole or in part for Information Technology, as defined in CRS § 24-37.5-102(2); which shall be governed by Addendum 1 §B.]* Unless specifically stated otherwise in this PO, all materials, including without limitation supplies, equipment, documents, content, information, or other material of any type, whether tangible or intangible (collectively "Materials"), furnished by the State to Vendor or delivered by Vendor to the State in performance of its obligations under this PO shall be the exclusive property of the State. Vendor shall return or deliver all Materials to the State upon completion or termination of this PO.
- 7. Reporting.** If Vendor is served with a pleading or other document in connection with an action before a court or other administrative decision making body, and such pleading or document relates to this PO or may affect Vendor's ability to perform its obligations under this PO, Vendor shall, within 10 days after being served, notify the State of such action and deliver copies of such pleading or document to the State. Vendor shall disclose, in a timely manner, in writing to the State all violations of federal or state criminal law involving fraud, bribery, or gratuity violations potentially affecting this PO. The State may impose any remedies available, which may include, without limitation, suspension or debarment.
- 8. Conflicts of Interest.** Vendor acknowledges that with respect to this PO, even the appearance of a conflict of interest is harmful to the State's interests. Absent the State's prior written approval, Vendor shall refrain from any practices, activities, or relationships that reasonably may appear to be in conflict with the full performance of Vendor's obligations to the State hereunder. If a conflict or appearance of a conflict of interest exists, or if Vendor is uncertain as to such, Vendor shall submit to the State a disclosure statement setting forth the relevant details for the State's consideration. Failure to promptly submit a disclosure statement or to follow the State's direction with respect to the actual or apparent conflict constitutes a breach of this PO.
- 9. Warranties.** All provisions and remedies of the Colorado Uniform Commercial Code, CRS, Title 4 ("UCC"), relating to implied or express warranties for goods are incorporated herein, in addition to any warranties contained in this PO.
- 10. Inspection and Acceptance.** The State's final acceptance of goods or services is contingent upon completion of all applicable inspection procedures. All goods delivered shall be newly manufactured and the current model, unless otherwise specified. The State shall have the right to inspect goods or services provided under this PO at all reasonable times and places. The State shall be the sole judge in determining "equals" with regard to conformance with the specifications outlined in this PO for quality, price, and performance. If any of the goods or services do not conform to this PO, the State, at its sole discretion, may require Vendor to either **(a)** replace the goods specified by the State or **(b)** perform the services again, without additional payment from the State. When defects in the quality or quantity of goods or services cannot be corrected by replacement or re-performance, the State may **(c)** require Vendor to take necessary action to ensure that future performance conforms to this PO and **(d)** equitably reduce the payment due Vendor to reflect the reduced value of the goods or services performed. These remedies do not limit the remedies otherwise available in this PO, at law, or in equity.
- 11. Taxes.** The State is exempt from federal excise taxes and from State and local sales and use taxes. The State shall not be liable for the payment of any excise, sales, or use taxes imposed on Vendor. A tax exemption certificate will be made available upon Vendor's request.
- 12. Payment.** The State shall not pay Vendor any amount for performance under this PO in excess of the Document Total set forth on the Purchase Order document. The State shall pay Vendor for all amounts due within 45 days after the State's receipt of goods or services and acceptance of a correct invoice of amount due. Amounts not paid by the State within 45 days of the State's acceptance of the invoice shall bear interest on the unpaid balance beginning on the 45th day at the rate set forth in CRS §24-30-202(24) until paid in full. Interest shall not accrue if a good faith dispute exists as to the State's obligation to pay all or a portion of the amount due. Vendor shall invoice the State separately for interest on delinquent amounts due, referencing the delinquent payment, number of day's interest to be paid, and applicable interest rate. The State may benefit from any early payment discount offered by Vendor by making payment within the timeframes required by Vendor to be eligible for such discount. If Vendor offers an early payment discount, then the discount shall be shown on Vendor's invoices to the State, and if the State makes payment on the invoice within the time frame for the discount, Vendor shall either **(a)** accept the payment amount less the appropriate discount or **(b)** refund the discount back to the State. Except as specifically agreed in this PO, Vendor shall be solely responsible for all costs, expenses, and other charges it incurs in connection with its performance under this PO.
- 13. Assignment.** Vendor's rights and obligations under this PO shall not be transferred or assigned without the prior, written consent of the State and execution of a new PO. Any attempt at assignment or transfer without such consent and new PO shall be void. Any new PO approved by the State shall be subject to the same terms and conditions as those set forth in this PO.
- 14. Subcontracts.** Unless otherwise specified in this PO, Vendor shall not enter into any subcontract in connection with its obligations under this PO without the prior, written approval of the State. Vendor shall submit to the State a copy of each such subcontract upon request by the State. All subcontracts entered into by Vendor in connection with this PO shall comply with all applicable federal and state laws and regulations, shall provide that they are governed by the laws of the State of Colorado, and shall be subject to all provisions of this PO.

15. Severability. The invalidity or unenforceability of any provision of this PO shall not affect the validity or enforceability of any other provision of this PO, which shall remain in full force and effect, provided, that the parties can continue to perform their obligations in accordance with the intent of this PO.

16. Survival of Certain PO Terms. Any provision of this PO that imposes an obligation on a party after termination or expiration of this PO shall survive the termination or expiration of this PO and shall be enforceable by the other party.

17. Third Party Beneficiaries. Except for the parties' respective successors and assigns, this PO does not and is not intended to confer any rights or remedies upon any person or entity other than the parties. Enforcement of this PO and all rights and obligations hereunder is reserved solely to the parties. Any services or benefits which third parties receive as a result of this PO are incidental to this PO, and do not create any rights for such third parties.

18. Waiver. A party's failure or delay in exercising any right, power, or privilege under this PO, whether explicit or by lack of enforcement, shall not operate as a waiver, nor shall any single or partial exercise of any right, power, or privilege preclude any other or further exercise of such right, power, or privilege.

19. Indemnification. [Not Applicable to Inter-governmental POs] Vendor shall indemnify, save, and hold harmless the State, its employees, agents and assignees (the "Indemnified Parties"), against any and all costs, expenses, claims, damages, liabilities, court awards and other amounts (including attorneys' fees and related costs) incurred by any of the Indemnified Parties in relation to any act or omission by Vendor, or its employees, agents, subcontractors, or assignees in connection with this PO. This shall include, without limitation, any and all costs, expenses, claims, damages, liabilities, court awards and other amounts incurred by the Indemnified Parties in relation to any claim that any work infringes a patent, copyright, trademark, trade secret, or any other intellectual property right or any claim for loss or improper disclosure of any confidential information or personally identifiable information.

20. Notice. All notices given under this PO shall be in writing, and shall be delivered to the contacts for each party listed on the Purchase Order document. Either party may change its contact or contact information by notice submitted in writing to the other party without a formal modification to this PO.

21. Insurance. Except as otherwise specifically stated in this PO, Vendor shall obtain and maintain insurance as specified in this section at all times during the term of this PO: **(a)** workers' compensation insurance as required by state statute, and employers' liability insurance covering all Vendor employees acting within the course and scope of their employment; **(b)** Commercial general liability insurance written on an Insurance Services Office occurrence form, covering premises operations, fire damage, independent contractors, products and completed operations, blanket contractual liability, personal injury, and advertising liability with minimum limits as follows: \$1,000,000 each occurrence; \$1,000,000 general aggregate; \$1,000,000 products and completed operations aggregate; and \$50,000 any one fire; and **(c)** Automobile liability insurance covering any auto (including owned, hired and non-owned autos) with a minimum limit of \$1,000,000 each accident combined single limit. If Vendor will or may have access to any protected information, then Vendor shall also obtain and maintain insurance covering loss and disclosure of protected information and claims based on alleged violations of privacy right through improper use and disclosure of protected information with limits of \$1,000,000 each occurrence and \$1,000,000 general aggregate at all times during the term of this PO. Additional insurance may be required as provided elsewhere in this PO. All insurance policies required by this PO shall be issued by insurance companies with an AM Best rating of A-VIII or better. This insurance requirement shall not apply if this PO is solely for goods, as determined by the State, unless specifically stated otherwise in this PO or any attachment or exhibit to this PO. If Vendor is a public agency within the meaning of the Colorado Governmental Immunity Act, then this section shall not apply and Vendor shall instead comply with the Colorado Governmental Immunity Act.

22. Termination Prior to Vendor Acceptance. If Vendor has not begun performance under this PO, the State may cancel this PO by providing written notice to the Vendor.

23. Termination for Cause. (a) If Vendor refuses or fails to timely and properly perform any of its obligations under this PO with such diligence as will ensure its completion within the time specified in this PO, the State may notify Vendor in writing of non-performance and, if not corrected by Vendor within the time specified in the notice, terminate Vendor's right to proceed with this PO or such part thereof as to which there has been delay or a failure. Vendor shall continue performance of this PO to the extent not terminated. **(b)** Vendor shall be liable for excess costs incurred by the State in procuring similar goods or services and the State may withhold such amounts as the State deems necessary. **(c)** If after rejection, revocation, or other termination of Vendor's right to proceed under the UCC or this clause, the State determines for any reason that Vendor was not in default or the delay was excusable, the rights and obligations of the State and Vendor shall be the same as if the notice of termination had been issued pursuant to termination under **§25**.

24. Termination in Public Interest. The State is entering into this PO for the purpose of carrying out the public interest of the State, as determined by its Governor, General Assembly, or Courts. If this PO ceases to further the public interest of the State as determined by its Governor, General Assembly, or Courts, the State, in its sole discretion, may terminate this PO in whole or in part and such termination shall not be deemed to be a breach of the State's obligations hereunder. This section shall not apply to a termination for cause, which shall be governed by **§24**. A determination that this PO should be terminated in the public interest shall not be equivalent to a State right to terminate for convenience. The State shall give written notice of termination to Vendor specifying the part of this PO terminated and when termination becomes effective. Upon receipt of notice of termination, Vendor shall not incur further obligations except as necessary to mitigate costs of performance. For services or specially manufactured goods, the State shall pay **(a)** reasonable settlement expenses, **(b)** this PO price or rate for supplies and services delivered and accepted, **(c)** reasonable costs of performance on unaccepted supplies and services, and **(d)** a reasonable profit for the unaccepted work. For existing goods, the State shall pay **(e)** reasonable settlement expenses, **(f)** the PO price for goods delivered and accepted, **(g)** reasonable costs incurred in preparation for delivery of the undelivered goods, and **(h)** a reasonable profit for the preparatory work. The State's termination liability under this section shall not exceed the total PO price. As a condition for payment under this section, Vendor shall submit a termination proposal and reasonable supporting documentation, and cost and pricing data as requested by the State.

25. Funds Availability. Financial obligations of the State payable after the State's current fiscal year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available. If this PO is funded in whole or in part with federal funds, this PO is subject to and contingent upon the continuing availability of federal funds for the purposes hereof. The State represents that it has set aside sufficient funds to make payment for goods delivered in a single installment, in accordance with the terms of this PO.

26. Governmental Immunity. Liability for claims for injuries to persons or property arising from the negligence of the State, its departments, boards, commissions committees, bureaus, offices, employees and officials shall be controlled and limited by the provisions of the Colorado Governmental Immunity Act, CRS §24-10-101, et seq., the Federal Tort Claims Act, 28 U.S.C. Pt. VI, Ch. 171 and 28 U.S.C. 1346(b), and the State's risk management statutes, CRS §§24-30-1501, et seq. No term or condition of this PO shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections, or other provisions, contained in these statutes.

27. Independent Contractor. Vendor shall perform its duties under this PO as an independent contractor and not as an employee. Neither Vendor nor any agent or employee of Vendor shall be deemed to be an agent or employee of the State. Vendor shall not have authorization, express or implied, to bind the State to any agreement, liability or understanding, except as expressly set forth herein. Vendor and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through the State and the State shall not pay for or otherwise provide such coverage for Vendor or any of its agents or employees. Vendor shall pay when due all applicable employment taxes, income taxes and local head taxes incurred pursuant to this PO. Vendor shall **(a)** provide and keep in force workers' compensation and unemployment compensation insurance in the amounts required by law, **(b)** provide proof thereof when requested by the State, and **(c)** be solely responsible for its acts and those of its employees and agents.

28. Compliance with Law. Vendor shall comply with all applicable federal and state laws, rules, and regulations in effect or hereafter established, including, without limitation, laws applicable to discrimination and unfair employment practices.

29. Choice of Law, Jurisdiction and Venue. *[Not Applicable to Inter-governmental POs]* Colorado law, and rules and regulations issued pursuant thereto, shall be applied in the interpretation, execution, and enforcement of this PO. The UCC shall govern this PO in the case of goods unless otherwise agreed in this PO. Any provision included or incorporated herein by reference, which conflicts with said laws, rules, and regulations shall be null and void. All suits or actions related to this PO shall be filed and proceedings held in the State of Colorado and exclusive venue shall be in the City and County of Denver. Any provision incorporated herein by reference which purports to negate this or any other provision in this PO in whole or in part shall not be valid or enforceable or available in any action at law, whether by way of complaint, defense, or otherwise. Vendor shall exhaust administrative remedies in CRS §24-109-106, prior to commencing any judicial action against the State.

30. Prohibited Terms. Nothing in this PO shall be construed as a waiver of any provision of CRS §24-106-109. Any term included in this PO that requires the State to indemnify or hold Vendor harmless; requires the State to agree to binding arbitration; limits Vendor's liability for damages resulting from death, bodily injury, or damage to tangible property; or that conflicts with that statute in any way shall be void ab initio.

31. Vendor Offset and Erroneous Payments. *[Not Applicable to Inter-governmental POs or to POs issued solely for goods]* The State Controller may withhold payment under the State's Vendor offset intercept system for debts owed to State agencies for: **(a)** unpaid child support debts or child support arrearages; **(b)** unpaid balances of tax, accrued interest, or other charges specified in CRS §39-21-101, et seq.; **(c)** unpaid loans due to the Student Loan Division of the Department of Higher Education; **(d)** amounts required to be paid to the Unemployment Compensation Fund; and **(e)** other unpaid debts owing to the State as a result of final agency determination or judicial action. The State may also recover, at the State's discretion, payments made to Vendor in error for any reason, including, but not limited to, overpayments or improper payments, and unexpended or excess funds received by Vendor by deduction from subsequent payments under this PO, deduction from any payment due under any other contracts, grants or agreements between the State and Vendor, or by any other appropriate method for collecting debts owed to the State.

32. Public Contracts for Services. *[Not Applicable to offer, issuance, or sale of securities, investment advisory services, fund management services, sponsored projects, intergovernmental POs, or information technology services or products and services]* Vendor certifies, warrants, and agrees that it does not knowingly employ or contract with an illegal alien who will perform work under this PO and will confirm the employment eligibility of all employees who are newly hired for employment in the United States to perform work under this PO, through participation in the E-Verify Program or the Colorado Department of Labor and Employment ("CDLE") program established pursuant to CRS §8-17.5-102(5)(c). Vendor shall not knowingly employ or contract with an illegal alien to perform work under this PO or enter into a contract or PO with a subcontractor that fails to certify to Vendor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this PO. Vendor shall **(a)** not use E-Verify Program or CDLE program procedures to undertake pre-employment screening of job applicants during performance of this PO, **(b)** notify subcontractor and the State within three days if Vendor has actual knowledge that subcontractor is employing or contracting with an illegal alien for work under this PO, **(c)** terminate the subcontract if subcontractor does not stop employing or contracting with the illegal alien within three days of receiving notice, and **(d)** comply with reasonable requests made in the course of an investigation, undertaken pursuant to CRS §8-17.5-102(5), by CDLE. If Vendor participates in the CDLE program, Vendor shall deliver to the State a written, notarized affirmation that Vendor has examined the legal work status of such employee, and shall comply with all of the other requirements of the CDLE program. If Vendor fails to comply with any requirement of this provision or CRS §8-17.5-101 et seq., the State may terminate this PO for breach and, if so terminated, Vendor shall be liable for damages.

33. Public Contracts with Natural Persons. Vendor, if a natural person 18 years of age or older, hereby swears and affirms under penalty of perjury that such person **(a)** is a citizen or otherwise lawfully present in the United States pursuant to federal law, **(b)** shall comply with the provisions of CRS §24-76.5-101 et seq., and **(c)** has produced a form of identification required by CRS §24-76.5-103 prior to the date Vendor delivers goods or begins performing services under the terms of this PO.

PART II

Fort Lewis College Site Work Construction Specifications

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PART II – DETAILED SPECIFICATIONS

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01000 - GENERAL

1.00 WORK INCLUDED

01000 - General
 01010 - Summary of Work
 01040 - Coordination
 01050 - Field Engineering
 01060 - Codes, Standards, Reports, Permits
 01200 - Project Meetings
 01220 – Unit Prices
 01230 - Alternates
 01340 - Shop Drawings and Samples
 01410 - Testing
 01500 - Temporary Facilities
 01501 - Landscape Preservation
 01502 - Preservation of Trees and Shrubbery
 01512 - Dust Control
 01530 - Construction Site Barriers and Traffic Control
 01560 - Cleaning Up
 01565 – Water and Erosion Control
 01700 - Project Closeout

- 1.01 Daily Reports: The General Contractor shall keep a daily record of all on-site activities and conditions. This daily record shall include a description of the work being performed, the weather conditions, manpower on-site, visitors, and any other data relevant to the progress of the work. Copies of these daily reports shall be submitted to the Owner's Representative no less than once a month.
- 1.02 Project Meetings: The General Contractor shall schedule and conduct regular job coordination and sub-contractor meetings at the site and shall notify in advance the Architect/Engineer of such meetings. The Contractor shall keep a record of such meetings and distribute copies of such records to everyone in attendance, to others affected by decisions or actions taken at such meetings, and to the Architect/Engineer whether in attendance or not.
- 1.03 Record Drawings: The General Contractor shall keep one (1) complete set of contract documents on the premises which shall be an "as-built" record set. All changes in the work from that shown on the original drawings shall be recorded thereon in red pencil. This set shall be turned over to the Architect/Engineer with the final application for payment.
- 1.04 Operation and Maintenance Manuals: Where O & M manuals are called for; three (3) copies shall be required and shall be in 3 ring binders with hard covers and durable edge labeling.
- 1.05 Existing Conditions: Verify all existing conditions before ordering any fabrications and/or materials. Verify existing locations of all site utilities before beginning any site work.
- 1.06 Schedule of Values: The General Contractor shall provide a "Schedule of Values" to the Owner within 20 days of receiving the Notice to Proceed.

End of Section

SECTION 01010 - SUMMARY OF WORK

1.00 GENERAL

1.01 Project Name: **FL2204 – Concrete Sidewalk Replacement**1.02 Owner's Name: Fort Lewis College

The project involves installation removal and replacement of sidewalks on the North & South faces of Centennial 1000 Building. The work will require improvements to the existing irrigation systems in affected areas. The Contractor will be required to protect existing installations as well as make all necessary considerations for residents of the building to ensure safety and minimize impacts.

1.03 Contract Description

- A. Contract Type: Stipulated Price as described in State of Colorado Construction Purchase Order (State Form SBP-3.1 PO-OSA).

BASE BID ITEMS			
ITEM NO.	CONTRACT ITEM	UNIT	PLAN
1	SAWCUT, REMOVE AND DISPOSE OF ASPHALT/CONCRETE	CY	53
2	SUBGRADE PREPARATION AND COMPACTION	CY	72
3	CONCRETE PAVEMENT (6" THICKNESS)	CY	80
4	CUT AND CAP IRRIGATION LINES	COUNT	15

Notes:

1. Unclassified excavation, subgrade compaction and class 6 aggregate volumes within base bid tabulation are for concrete sidewalk improvements only.
2. The quantities listed in the Base Bid Items List represent the Engineers estimated quantities. Bidder is responsible for verifying all material quantities required to construct the improvements shown on plans.

1.04 Work By Owner

- A. As-needed relocation of irrigation, gas, and telecom mains and service lines.

1.05 Owner Supplied Products

- A. Products for work as necessary for work by Owner.

1.06 Products

- A. Owner's Responsibilities:
 1. Arrange for and deliver Owner reviewed Shop Drawings, Product Data, and Samples, to Contractor.
 2. Arrange and pay for Product delivery to site.
 3. On delivery, inspect Products jointly with Contractor.
 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 1. Review Owner reviewed Shop Drawings, Product Data, and Samples.
 2. Receive and unload Products at site; inspect for completeness or damage jointly with Owner.
 3. Handle, store, install and finish Products.
 4. Repair or replace items damaged after receipt.

1.07 Contractor Use of Site and Premises

- A. Limit use of site and premises to allow:
 1. Owner occupancy.
 2. Use of site and premises by the public, and College personnel for on-going maintenance work. Conduct work to protect safety of public and to minimize impacts to College operations. Individual walkways/ driveways of the Project may be closed for limited duration to allow for efficient prosecution of the work as coordinated in advance with Fort Lewis College.
- B. Access to Site:
 1. Primary access to the project site area by the Contractor and subcontractors will be allowed from the Northeast corner of the project site unless otherwise coordinated and approved in advance by Fort Lewis College.
 2. Removal of demolition debris and materials shall occur from the project site area, and be hauled off campus. The Contractor shall be responsible for protecting all existing landscaping not scheduled to be demolished.
 3. The Contractor shall stage any demolition and new construction improvements work to allow the removal and transportation of the demolition debris and materials without affecting pedestrian or vehicular traffic along the project corridor.
 4. Access to all building and facilities must be maintained and coordinated with FLC personnel.
- C. Emergency Site Access and Egress during Construction: Provisions must be allowed for emergency vehicular access as necessary through the construction zone.
- D. Construction Operations: Limited to areas noted on Drawings.
- E. Time Restrictions for Performing Exterior Work: Normal work hours are Monday through Friday 8:00AM through 6:00 PM. Requests to work outside of normal work hours will be considered and accommodated as allowable. Coordinate and obtain advance approval with Fort Lewis College Physical Plant Services.
- F. Utility Outages and Shutdown: Coordinate and obtain approval for any utility shutdowns with Fort Lewis College Physical Plant Services. Provide 48 hour minimum notice in advance of any desired utility interruptions.

1.08 Work Sequence

- A. Construct Work to accommodate Owner's occupancy requirements during the construction period, coordinate construction schedule and operations with Owner. The following is a summary of the pre-construction and construction phasing for the project, and dates for completion of the various portions of work. The contract construction period will begin on the date of the Notice to Proceed, and shall be accomplished in the number of calendar days stipulated in the Advertisement for Bids.

Pre-Construction Activities:

Construction Documents Ready for Bidding:	March 12, 2026
Contractor Pre-Bid Conference and Walk-Through:	March 18, 2026, 2:00 PM
Bid Opening:	March 30, 2026 2:30 PM
Notice of Award (Tentative Date):	March 31, 2026
Notice to Proceed Issued (Tentative Date):	April 10, 2026

Construction Activities:

On Site - Construction Start (First available date)	May 4, 2026
Substantial Completion date	May 22, 2026
Date of Final Completion:	May 29, 2026

1.09 Owner Occupancy

- A. The Owner may occupy and utilize the construction staging area(s) as indicated in the plan set for the conduct of normal operations, and work by other Contractors.
- B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
- C. Schedule the Work to accommodate owner occupancy.

1.10 Asbestos Free Materials

- A. All products furnished to Fort Lewis College shall be free of asbestos containing materials. A data sheet shall be supplied for each product that states that the product is free of asbestos containing materials. By delivering the products to Fort Lewis College without first supplying the product data sheet, the supplier certifies that all products furnished do not contain asbestos in any form.
- B. Failure to provide the product data sheets before delivery does not relieve the supplier of the responsibility to provide the product data sheet. Any product that is found to contain asbestos, and was previously certified to be free of asbestos, shall be replaced at the supplier's expense to the satisfaction of the Owner.

2.00 **PRODUCTS**
Not Used.3.00 **EXECUTION**3.01 Job- Site Asbestos

- A. The Contractor shall notify Fort Lewis College (FLC) within 24 hours, if any asbestos containing materials (ACM) is discovered during the course of the work under contract that will require removal. Work in areas with suspected asbestos containing materials will be halted until FLC can verify and remove the ACM if necessary. FLC will proceed with identification, testing and removal of the ACM in a timely manner.

End of Section

SECTION 01040 - COORDINATION

The General Contractor shall employ a full-time, on-site, competent project superintendent experienced in projects of this scale and complexity and is fully authorized as his agent on the work. Proof of the adequate experience in projects of this scale and/or type shall be furnished to the Architect/Engineer or Owner upon request. The superintendent shall be capable of reading and fully understanding the plans and specifications and shall receive and fulfill instructions from the Architect/Engineer.

The superintendent shall direct and coordinate the work of the various sub-contractors to ensure the progress of the work. He shall familiarize himself fully with the Plans and Specifications in advance of work being constructed and shall notify the Architect/Engineer immediately of any conflict or discrepancy.

The Contractor is advised that the Principal Representative may enter into separate contracts for work in designated locations adjacent to project work areas and shall be responsible to properly coordinate his or her work with Fort Lewis College and others performing work for Fort Lewis College.

End of Section

SECTION 01050 - FIELD ENGINEERING

Prior to the start of any construction, the Contractor's field engineer shall verify existing grades, lines levels, and dimensions as required for the construction. Notify the Owners Representative immediately if any errors or inconsistencies are discovered.

Prior to the start of any excavation work stake out the construction layout lines in accordance with the plans and specifications and notify Architect/Engineer if not consistent with dimensions shown on plans.

Existing Conditions: Prior to trenching, excavate trench at location where routing crosses existing utilities and verify that proposed pipe elevations do not conflict with existing utility lines, duct bank, etc. Notify Owners Representative immediately if there is any conflict. Verify all existing conditions before ordering any fabrications and/or materials. Verify existing locations of all site utilities before beginning any site work.

End of Section

SECTION 01060 - CODES, STANDARDS, REPORTS, PERMITS

1.00 CODES and LAWS

1.01 These construction documents, and the joint and several phases of construction hereby contemplated are to be governed at all times by applicable provisions of the Federal Law(s), including but not limited to, the latest amendments of the following:

- A. Williams - Steigler Occupational Safety and Health Act of 1970, Public Law 91-596
- B. Part 1910 - Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations
- C. Part 1518 - Safety and Health Regulations for Construction, Chapter XIII of Title 29, Code of Federal Regulations
- D. Americans with Disabilities Act (ADA) Appendix B - 28 CFR Part 36
- E. Uniform Building Code, 1991 Edition
- F. Uniform Plumbing Code, 1991 Edition
- G. Uniform Mechanical Code, 1991 Edition
- H. Uniform Fire Code, 1991 Edition
- I. National Electric Code of the NFPA, latest edition
- J. National Board of Fire Underwriters, latest edition
- K. NFPA - latest edition

1.02 Standards

- A. The following Standards are hereby made a part of these specifications to the same extent as if they were written herein, except that they may be amended or superseded by these Specifications or the Drawings. The date of the standard that is in effect is the date of the Contract Documents except when a specific date is specified.
 - 1. American Concrete Institute Guide for Concrete Floor and Slab Construction, ACI-302, latest edition
 - 2. American Institute of Steel Construction, latest edition
 - 3. American Society for Testing and Materials, latest edition
 - 4. American Standards for Nursery Stock, current edition
 - 5. American Welding Society, latest edition
 - 6. Associated Landscape Contractors of Colorado Specifications, 1991 edition
 - 7. Fort Lewis College Minimum Standards for Landscape Irrigation, 1994 edition
 - 8. Fort Lewis College Sitework Construction Standards Manual, 1995 edition
 - 9. Manual on Uniform Traffic Control Devices (MUTCD), latest edition
 - 10. State of Colorado Division of Highways Standard Specifications for Road & Bridge Construction, latest edition

End of Section

SECTION 01359 – ARCHAEOLOGICAL AND ARTIFACT PROCEDURES

PART 1 - GENERAL

INDIAN ARTIFACTS: Archaeological sites, Indian artifacts, and evidence of the possibility of ancient grave or campsites have been found on the campus. All workmen involved in the excavation work shall be informed by the Contractor as to the possibility of archaeological structures and artifacts on campus. The Contractor is cautioned that all such materials are the property of the State of Colorado, through the college, and when discovered shall not be removed or disturbed until the college officials have evaluated the archaeological findings. In the event the historical, prehistorical, or archaeological resources are discovered in the course of construction, the Contractor should refrain from knowingly damaging such resources and should notify the College. To knowingly disturb historical, prehistorical, or archaeological resources on public land is a misdemeanor; to knowingly disturb human remains on public or private lands is also a misdemeanor.

The State of Colorado reserves to itself title to all historical, prehistorical, or archaeological resources in all lands, rivers, lakes, reservoirs, and other areas owned by the State. Historical, prehistorical, or archaeological resources shall include all deposits, structures, or objects which provide information pertaining to the historical or prehistorical culture of the people within the boundaries of the State of Colorado, as well as fossils and other remains of animals, plants, insects, and other objects of natural history within such boundaries.

Any person who knowingly appropriates, excavates, injures, or destroys any historical prehistorical, or archaeological resource on land owned by the state without a valid permit is guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the county jail for not more than thirty days, or by both such fine and imprisonment. All articles illegally taken and all moneys and materials derived from the sale or trade of the same shall be forfeited to the State Historical Society.

Any person who discovers on any land suspected human skeletal remains or who knowingly disturbs such remains shall immediately notify the coroner or the county wherein the remains are located and the college. If it is confirmed that the remains are human remains but of no forensic value, the coroner shall notify the state archaeologist of the discovery. The state archaeologist shall recommend security measures for the site. Prior to further disturbance, the state archaeologist shall cause the human remains to be examined by a qualified archaeologist to determine whether the remains are more than one hundred years old and to evaluate the integrity of their archaeological context. Complete documentation of the archaeological context of the human remains shall be accomplished in a timely manner.

Any person who knowingly disturbs an unmarked human burial in violation of this part 13 commits a class 1 misdemeanor and shall be punished as provided in section 18-1-1-6, C.R.S. Any person who has knowledge that an unmarked human burial is being unlawfully disturbed and fails to notify the local law enforcement agency with jurisdiction in the area where the unmarked human burial is located commits a class 2 misdemeanor and shall be punished as provided in section 18-1-106, C.R.S.

The college will have a consultant on site as needed to assist with the management of the discovery of any archaeological sites, artifacts, or human remains that may be encountered. The resolution of any situation related to the discovery of archaeological sites, artifacts, or human remains shall be in compliance with State of Colorado laws governing the disposition thereof. The state laws include all applicable provisions of the Historical, Prehistorical, and Archaeological Resources Act of 1973 (CRS 24-80-401 ff), as amended, and An Act Concerning the Preservation of Historical, Prehistorical, or Archaeological resources of Colorado, 1990 (CRS 24-80-401, 405, 408, 409, 411, and 24-80-1301 through 1305).

END OF SECTION 013591

SECTION 01410 - TESTING

The testing agency shall be an independent laboratory approved by the Owner. The Owner will pay for the costs of initial testing. The cost of subsequent retesting necessitated by the failure to meet the specifications based on the initial test shall be paid for by the Contractor. The Contractor shall be responsible for providing the Owner with advance notification as to when areas will be ready for testing and coordinating with the Testing Agency to see that their work is accomplished.

1.00 COMPACTION TESTING

- 1.01 Compaction Testing. Testing shall be made prior to the placement of improvements at the top of the subbase, at the top of the base course, and as otherwise required by these Specifications. Contractor to cooperate fully with all persons engaged in testing. Contractor to excavate as required to allow testing; Contractor to backfill all test excavations in accordance to these Specifications.
- 1.02 Reference Standards. Density/moisture relationships to be developed for all soil types encountered according to ASTM D698 or ASSHTO T99.
- 1.03 Field Testing. Testing for density during compaction operations to be done in accordance with ASTM D29922 using nuclear density methods.
- 1.04 Frequency of Testing. Conduct a minimum of one test for each layer of specified depth of fill or back-fill as follows:
 - A. Pavement and Walks: For each 2,000 square feet or less.
 - B. Other: As directed by Engineer or Owner's Representative.

2.00 CONCRETE TESTING

- 2.01 The Testing laboratory shall take four (4) cylinders for each test; break one (1) at seven days; two (2) at twenty-eight days; retain one (1) for forty-five day break if necessary.
- 2.02 During the progress of construction, tests under the direction of the engineer shall be made to determine whether the concrete being produced complies with the quality specified. The General Contractor shall cooperate in the making of such tests by furnishing the labor, cylinders, and concrete required, and providing protection of the specimens against injury or loss through his operations. The General Contractor shall notify the Owner's testing laboratory twenty-four (24) hours in advance of any pour.

End of Section

SECTION 01500 - TEMPORARY FACILITIES

All temporary facility and utility costs shall be included in this Section. The Contractor shall arrange and pay for the temporary connection and provision of electrical power, space heating, and water. All services to the existing Campus shall be maintained at all times.

Temporary storage facilities shall be provided for the purpose of protecting stored materials that may be damaged by storage in the open. The Contractor shall do no work at any time, nor shall he permit work to be performed, under any conditions unsuited to its perfect execution, safety and permanence. At all times when the temperature is low enough to require it, the Contractor shall heat and protect any materials subject to injury by cold or frost.

Temporary fencing, barricades, sidewalks and walkways shall be provided as required for the duration of the construction period or until permanent facilities are in place and accepted by the Owner. Contractor shall be responsible for the removal of all temporary facilities at the completion of the job and the return of all areas damaged to their original condition before work began.

If temporary heat is required for the protection, or expediting of the work, the Contractor shall provide approved heating apparatus, and shall provide adequate and proper fuel, and shall maintain heat as required for protection, expediting or drying out of the work. The temporary heating apparatus shall be installed and operated in such a manner that the finished work will not be damaged, and any such damage shall be corrected at the expense of the Contractor.

The Contractor shall provide storage suitable for the protection of materials and tools. Provide temporary toilet facilities if required to comply with governing health and safety regulations. Provide drinking water for construction personnel through either water supply connected fixtures or by containerized dispensers.

Provide protection for existing trees and vegetation. Protection to be set at tree drip lines. Protection of existing vegetation is very important to the Owner. All trenching through the undisturbed area(s) outlined in the Drawings shall be approved by the Architect/Engineer prior to construction. An attempt will be made to miss all large existing trees and shrubs, etc.

End of Section

SECTION 01501 - LANDSCAPE PRESERVATION**1.00 GENERAL**

- 1.01 The contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, approved construction roads, or excavation operations, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage by the contractor's operations and equipment. The edges of clearings and cuts through trees, shrubbery and vegetation shall be irregularly shaped to soften the undesirable visual impact of straight lines. Movement of crews and equipment within the right-of-way and over routes provided for access to the work shall be performed in a manner to prevent damage to property and existing landscaping. All unnecessary destruction, scarring, damage, or defacing of the landscape resulting from the contractor's operations shall be repaired, replanted, reseeded, or otherwise corrected as directed by the Owner and at the contractor's expense.
- 1.03 Construction Roads: The location, alignment, and grade of construction roads shall be subject to the approval of the Owner. When no longer required by the contractor, all construction roads shall be returned to the original contour, surface scarified and re-vegetated as specified.
- 1.04 Temporary Facilities: All construction temporary facilities shall be located and arranged in a manner to preserve tree and vegetation to the maximum extent possible. When no longer required, all temporary facilities shall be totally removed from the site. The area shall be re-graded as required so that all surfaces drain naturally, blend with the natural terrain and are re-vegetated as specified.
- 1.05 Borrow Areas and Quarry Sites: Borrow pits and quarry sites shall be so excavated that water will not collect and stand therein. Before being abandoned, the sides of borrow pits and quarry sites shall be brought to stable slopes with slope intersections shaped to carry the natural contour of adjacent undisturbed terrain into the pit or borrow area giving a natural appearance. All rubbish, construction equipment and structures shall be removed from the site.
- 1.06 Repair Irrigation System Lateral Crossings: Work shall include locating and carefully exposing, cleanly cutting and properly capping each irrigation system lateral crossing the sidewalk area. Final irrigation repairs to be completed by FLC.

End of Section

SECTION 01502 - PRESERVATION OF TREES AND SHRUBBERY

1.00 **PRESERVATION:**

- 1.01 All trees and shrubbery which are not specifically required to be cleared or removed for construction purposes shall be preserved and shall be protected from any damage that may be caused by the contractor's construction operations and equipment. Special care shall be exercised where trees or shrubs are exposed to injuries by construction equipment, excavating, dumping, chemical damage, or other operations; and the contractor shall adequately protect such trees by the use of protective barriers or other methods as directed by the Owner's Representative. The removal of trees or shrubs shall only be permitted after written approval by the Owner.
- A. The layout of the contractor's temporary facilities and operations in borrow and spoil areas shall be planned and conducted in such manner that all trees and shrubbery not approved for removal shall be preserved and adequately protected from either direct or indirect damage by the contractors' operations.
- B. Except in emergency cases or when otherwise approved by the Owner, trees shall not be used for anchorages. Where such use is approved by the Owner, the trunk shall be wrapped with a sufficient thickness of protective material before any rope cable or wire is placed.
- 1.02 Repair or Treatment of Damage: The contractor shall be responsible for injuries to trees and shrubs caused by his operations. The term "injury" shall include, without limitations, bruising, scarring, tearing, and breaking of roots, trunk or branches. All injured trees and shrubs shall be repaired or treated without delay, at the contractor's expense. If damage occurs, the Owner shall determine the method of repair or treatment to be used for the injured trees or shrubs as recommended by an experienced horticulturist or a licensed tree surgeon provided by and at the contractor's expense. All repairs or treatment of injured trees shall be performed under the direction of an experienced horticulturist or a licensed tree surgeon provided by and at the expense of the contractor.
- 1.03 Replacement: Trees or shrubs that, in the opinion of the Owner, are beyond saving shall be removed and replaced early in the next planting season. The replacement shall be the same species, or other approved species, of equal size or the maximum size that is practical to plant and sustain growth in the particular environment. Replacement trees and shrubs shall be guyed if necessary, watered, and guaranteed for a period of 1 year. Any replacement tree or shrub that dies during this period shall be removed and replaced as noted in this paragraph.

End of Section

SECTION 01512 - DUST CONTROL

The Contractor shall employ all means necessary and shall furnish all labor, equipment and materials required to carry out proper and efficient dust control, and to prevent dust which has originated from his operations from damaging landscaped areas and structures and from causing a hazard to traffic or a nuisance to persons. The Contractor will be held liable for any damage resulting from dust originating from his operations under this Contract. The cost of sprinkling or of other methods of dust control shall be included in the prices bid for the other items of work.

End of Section

SECTION 01530 - CONSTRUCTION SITE BARRIERS & TRAFFIC CONTROL

1.00 GENERAL

- 1.01 Scope. The work of this section consists of furnishing, installing and maintaining barricades, signage, temporary detours, etc., for control of automobile, bicycle and pedestrian traffic during construction. Also included in the work are furnishing, installing and maintaining suitable barriers to prevent public entry and to protect existing facilities, existing landscaping (identified to remain) and the public from construction operations.

1.02 Related Work Specified Elsewhere.

Section 01500 - Temporary Facilities
Section 01512 - Dust Control

2.00 MATERIALS

- 2.01 General. Material may be new or used, but shall be suitable for intended purposes. Fences and barriers shall be structurally adequate and neat in appearance.

- 2.02 Fencing. Minimum height, 6 feet, unless authorized otherwise by the Owner.

- 2.03 Barricades and Signs. MUTCD, Part VI, Traffic Controls for Street and Highway Construction and Maintenance Operations, and Colorado Division of Transportation (CDOT) AS $\cong$ Standards. Where CDOT Type 4 precast concrete barriers are utilized, they shall have reflectors as specified in Standard S-614-51.

- 2.04 Wood Planking. Lumber, free of nails, large knot holes and splinters.

- 2.05 Material for Surface of Stabilized Construction Entrance. AASHTO Designation M43, Size No. 2 (8-1/2" to 1-1/2").

3.00 METHODS AND PROCEDURES

- 3.01 General. Any work within a public thoroughfare that involves the temporary closure of a lane of traffic shall be approved by the College in advance of the work and shall be completed between the hours of 8:00 A.M. and 6:00 P.M., at which time all barricades shall be removed and the roadway completely opened to traffic. All requirements herein shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), latest revision, as well as any additional requirements of the College.

- 3.02 Barricades, Flagging and Watchmen. The Contractor shall erect and maintain barricades and sufficient safeguards around all excavations, embankments, and obstructions; shall provide suitable warning lights near the work and keep them lighted at night or other times when visibility is limited and shall employ such watchmen as may be necessary for the protection of the public. When a traffic lane is temporarily closed and two way traffic must be maintained, the Contractor shall use flag personnel to control traffic movement.

- 3.03 Street and Service Drive Closures. No street or service drive shall be closed by the Contractor except as authorized by the Engineer and in accordance with procedures outlined herein. Wherever, in the prosecution of the work, the Contractor finds it necessary to close a street to traffic, he shall advise the College forty-eight (48) hours in advance of the time when the street will require closing. Twenty-four (24) hours prior to commencement of work, the Contractor shall furnish and install approved No Parking signs giving the day of the week; i.e. No Parking in this area on Thursday. At the time of posting, verbal notice of intent shall be given to occupants of premises involved. In cases of emergency, involving conditions over which the Contractor has no control, the street may be closed. In these cases, the Contractor is required to immediately notify the Fort Lewis College Security Department.

SECTION 01530 - CONSTRUCTION SITE BARRIERS & TRAFFIC CONTROL

- 3.04 Detours. Wherever streets or alleys are closed as provided herein, it will be the sole responsibility of the Contractor to adequately mark and light the detours as determined by the Contractor and the Engineer after consultation with the College, and in accordance with standard details indicated on plans for this project.
- Traffic shall not be routed over detours until they have been bladed and shaped (and paved where required) in such a way as to provide a reasonably safe and convenient roadway to the traveling public. Where detours are established over such areas or over unpaved streets, it shall be the responsibility of the Contractor to maintain such detours with a minimum of inconvenience to the public. The Contractor shall minimize inconvenience from dust.
- 3.05 Traffic Maintained Over Construction. Where traffic is maintained along the street or service drive under construction, care shall be used to shape and maintain the roadbed so that a safe and convenient roadway is available to the traveling public. Ramps from undisturbed streets into excavated areas shall be maintained for traffic on gradual grades and in no case shall a ramp be steeper than a 10:1 slope. The Contractor shall make full provisions for minimizing inconvenience from dust. During periods when actual construction is not in progress, streets shall be properly maintained and dust control measures shall be employed.
- 3.06 Protection of Street Signs, Traffic Signs, and Signals. Street signs, traffic signs, signals and other traffic control devices already in place for information and to safeguard traffic must be protected by the Contractor. Where it is necessary to disturb or remove any of these items, the Contractor shall secure approval of the Engineer prior to any such work.
- 3.07 Protection of the Public. Fence, barricade, or otherwise block off the immediate work area to prevent unauthorized entry to the work area. Erect and maintain barricades, lights, danger signals, and warning signs in accordance with ANSI/ANSI D6.1. Illuminate barricades and obstructions at night; keep safety lights burning from sunset to sunrise. Adequately barricade and post all open cuts including special provisions for those adjacent to thoroughfares. Protect pedestrian traffic by fences to channelize and direct pedestrian traffic along approved routes. When pedestrian traffic is detoured into a roadway, provide temporary walkways with any necessary protection at ends and overhead. For walkways, use lumber running parallel to direction of traffic movement and provide ramps at changes of elevation. Cover pipes, hoses, and power lines crossing sidewalks and walkways with troughs using beveled edge boards. Erect and maintain sufficient detour signs at road closures and along detour routes.
- 3.08 Removal. Completely remove barriers no longer needed and when approved by the Engineer.

End of Section

SECTION 01560 - CLEANING UP

The General Contractor shall be responsible on a regular basis for the sweeping, brushing, and other general cleaning of the completed work and the removal from the site of debris, surplus material, tools not in active use, and scaffolding or other equipment no longer needed. All trash container rental, hauling and dump fees are to be included in this Section. The final cleanup shall be done prior to the punch list being made and shall be done with care, removing all marks, stains and smears. All items that are stained, smeared, scratched or cannot be cleaned shall be replaced at no cost to the Owner.

End of Section

SECTION 01565 - WATER AND EROSION CONTROL

1.00 GENERAL

1.01 Scope. All work performed under this specification will be considered as part of the General Conditions of the contract. Furnish all labor, material and equipment necessary for completion of the following work during construction:

- A. To temporarily provide, place and maintain ample means and devices with which to promptly remove and properly dispose of all water entering excavations or which may flow along or across the site.
- B. To protect excavations from the effects of water entering or leaving the excavation.
- C. To control the amount of sediment-laden water leaving the construction site which is created from excavation, backfilling and any other construction operations.
- D. To control all surface water and/or ground water that impacts the construction site.

1.02 Related Work Specified Elsewhere.

- A. Section 02140 – Dewatering
- B. Section 02220 - Excavation, Backfilling and Compaction
- C. Section 02221 – Trenching, Backfilling and Compaction

1.03 Project Conditions.

- A. The Contractor's plan shall determine the methods by which he will temporarily divert, detain or otherwise control the flow of water from drainage through the construction area. The Contractor shall also determine the means by which he will control alluvial or subsurface flow, springs, surface runoff, irrigation water, excessive soil moisture and any and all other forms of water which may occur under normal or flood conditions. Any controlling of surface and/or ground water shall be performed in such a manner that recently constructed portions of the project are not damaged by either normal or flood flows. If necessitated by storm water events, the Contractor shall be responsible for the re-establishment of soil, topsoil, grading, reseeding, or sod replacement; replacement of damaged concrete work or riprap; removal of silt or debris which may be deposited within the project area by the flow of water; and other work as necessary to repair said damage.
- B. At no time during construction shall the Contractor affect existing drainage patterns of adjacent property owners. Any damage to adjacent properties which result from the Contractor's alteration of any drainage patterns, alluvial or ground water flows or subsurface drainage shall be repaired by the Contractor at no additional cost to the Owner.
- C. The Contractor may employ 24-hour per day pumping for control of water if necessary. Noise emitted from the pumping operations shall be controlled to conform to local requirements.

1.04 Submittals.

- A. A detailed Water and Erosion Control Plan shall be submitted to the Owner's Representative for review and approval prior to the start of construction. The following information is offered as guidance in preparation of this plan:

- 1. Describe the sequence of construction.

SECTION 01565 - WATER AND EROSION CONTROL

2. Describe the control facilities. Indicate the location of the vehicle tracking control areas, straw bales, sediment traps, silt fences, site fence and other facilities.
 3. Describe inspection and maintenance. The Contractor should inspect the erosion control measures weekly during construction. Remove excessive sediment deposition upstream of the silt fences and redistribute up slope from the silt fences. Silt fences that are deflected from the vertical position or are unstable should be re-established. The vehicle tracking erosion control measure should be maintained daily by removing any dirt or gravel that has been moved out into the streets and placing new gravel as may be required to insure that the gravel is functioning properly to remove mud from the tires of construction equipment.
 4. Dust Prevention - During construction, and until final acceptance by the Owner, the Contractor shall be responsible for controlling dust emissions in the construction area. No earthwork activities shall be performed when the wind speed exceeds thirty miles per hour (30 mph). Whenever conditions exist that create airborne soil particles the Contractor shall, at his expense, wet all disturbed areas as often as necessary to control the dust. All fill areas shall be compacted daily or as directed by the Owner's Representative. Any dust control or clean up done by the Owner due to the Contractor's failure to comply with these requirements shall be charged to the Contractor
- B. Schedule - Submit a detailed schedule showing dates for implementation of the required erosion control practices as they relate to proposed construction activities.
- 1.05 Permits. The Owner's Representative shall obtain the required discharge permit from the Colorado Department of Public Health and Environment local governing entity based upon the Contractor's approved Water and Erosion Control Plan.
- 2.00 MATERIALS
- 2.01 General. All materials necessary for the control of runoff, water and erosion shall be provided by the Contractor. These may include, but shall not be limited to, pumps and associated energy costs, well materials, sediment control materials and devices, inlets, pipe, and other devices as necessary to by-pass and control flow around or through the construction site.
- 3.00 METHODS AND PROCEDURES
- 3.01 General.
- A. The Contractor shall be required to temporarily relocate drainage ways, by-pass the flow, de-water excavated areas or otherwise control runoff and water so that the project can be constructed in accordance with the Drawings.
 - B. All excavations shall be kept dry until the structures and appurtenances to be built therein have been completed to such an extent that they will not be damaged. At that time, the Contractor may remove such temporary means and devices utilized in the control of runoff and water.

End of Section

SECTION 01700 - PROJECT CLOSEOUT

- 1.02 Final acceptance shall be determined as follows: The Contractor shall give written notice to the Owners Representative two (2) working days in advance of the proposed completion date stating that the work will be completed on that date. On the proposed completion date an inspection group consisting of representatives of the Owner and Contractor will conduct a joint inspection of the site. A list will be prepared of all incomplete and unacceptable items considered essential to the completion and use of the work. When the Contractor feels that the items on the above list are corrected and/or completed, he will again give written notice as outlined above and another joint inspection will be made. If additional inspections are necessary due to work still found to be incomplete or unacceptable, the above method will be used for further inspections.
- 1.03 The acceptance by the Contractor of final payment by the Owner shall constitute a release and waiver of any and all claims whatsoever by the Contractor against the Owner, provided, however, that acceptance of final payment shall not constitute a release or waiver of unsettled claims which had been presented to the Owner in writing prior to the tender of final payment by the Owner.
- 1.04 Proper completion of any and all requirements herein above set forth shall be a condition precedent to any final payment.
- 1.05 Refer to General Conditions for additional closeout requirements.

End of Section

DIVISION 2

SITE WORK

SECTION 02000 - GENERAL

1.0 GENERAL

1.01 The General Conditions, Supplementary General Conditions, and Division 1 - General Requirements, is a part of this division as far as they are applicable to the work specified herein.

1.02 The Contractor shall provide all items, articles, materials, operations or methods listed, mentioned, or scheduled on the Drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.

1.03 Work Included

- 02000 - General
- 02020 - Construction Staking
- 02050 - Selective Demolition
- 02100 - Site Preparation
- 02140 - Dewatering
- 02220 - Excavation, Backfilling and Compaction
- 02221 - Trenching, Backfilling and Compaction
- 02230 - Embedment and Base Course Aggregate
- 02520 - Concrete Paving, Sidewalk, and Curb and Gutter
- 02522 - Asphalt Coatings
- 02523 - Asphalt Joint and Crack Sealant
- 02550 - Asphalt Paving and Reinforcing
- 02560 - Asphalt Reclamation
- 02580 - Pavement Marking
- 02720 - Storm Drainage
- 02841 - Traffic Signage
- 02952 - Seeding Turf and Dryland Grasses

1.04 It shall be the responsibility of the Contractor to examine the site of the work, and after initial investigation, to decide for himself the character of materials to be encountered and all other existing conditions affecting the work. The Contractor shall protect from damage any existing structures and/or existing utilities on the site. The Contractor shall restore damaged items at his own expense to a condition equal to that existing prior to damage by repairing, rebuilding, or replacing. Rules and regulations governing the respective utilities shall be observed under this contract in executing all work.

End of Section

SECTION 02020 - CONSTRUCTION STAKING**1.00 GENERAL**

- 1.01 Scope. This work consists of the construction surveying, calculating, layout and staking necessary for the construction of all elements of the project. The work shall be done under the supervision of a Registered Professional Engineer (P.E.) or Land Surveyor (L.S.) who is experienced and competent in construction surveying and registered in the State of Colorado. The P.E. or L.S. shall be available to review work, resolve problems, and make decisions in a timely manner.

2.00 MATERIALS

- 2.01 General. The Contractor shall furnish all personnel, materials, equipment, and traffic control necessary to perform the required construction surveying and staking.

3.00 METHODS AND PROCEDURES

- 3.01 Contractor Surveying. The Contractor shall perform all construction surveying and staking that is necessary for construction of the project. Construction surveying and staking shall be based on the survey controls established by the City of Durango. Construction work shall not be performed until adequate lines and grades have been established by the Contractor. The Engineer may require additional Contractor layout, staking, or surveying control as part of the original bid if necessary to obtain acceptable completion of the original contract work.
- 3.02 Construction Staking. Roadway staking will include stakes for centerline, slopes, grades (blue tops), curb and gutter, sidewalks, and islands. Grade stakes for finished subgrade will not be set until the grade established by the slope stakes is constructed to within 0.3 foot of the finished subgrade elevation. Major structures staking and references will be limited to centerlines, work lines, or control lines, appropriate offset lines and grades, and elevations set for footings, foundations, and finished floor elevations. Minor structures and retaining wall staking will be limited to stakes establishing line and grade by using offset line and grade stakes. It will be the responsibility of the Contractor to use these references and marks and establish any additional control and layout necessary for the proper execution of the work in its final location. The Contractor shall be responsible for the accuracy of all the vertical and horizontal control in transfers and establishes.
- 3.03 Maintaining Staking. The Contractor shall be held responsible for the preservation of all stakes and marks, and if any are destroyed, disturbed or removed, the cost of replacing them will be borne by the Contractor. Control points, bench marks, and other needed stakes that are damaged, destroyed, or made inaccessible by the progress of construction shall be replaced, transferred, or re-established by the Contractor at no additional cost to the College.
- 3.04 Changes. All changes in lines and grades required by field conditions, and all discrepancies in grades, alignment, location or dimensions detected by the Contractor shall be immediately brought to the attention of the Engineer. No changes in given data or plans will be allowed unless approved by the Engineer. All changes shall be documented in field survey notebooks.
- 3.05 Responsibility and Checking. Supervision and coordination of construction surveying and staking is the Contractor's responsibility. The Engineer may check the Contractor's surveying and staking, however, such checking will not relieve the Contractor of any responsibility for accuracy or completeness of work. All Contractor surveying and staking inaccuracies shall be corrected by the Contractor at no cost to the College. Engineer's checking or Contractor's corrections shall not entitle the Contractor to additional cost or contract time extension.
- 3.06 Survey Records. Field survey notes for construction surveying and staking shall be recorded by the Contractor in survey notebooks. All survey records generated will be considered the property of the College and shall be available for inspection or reproduction at anytime. All survey and staking notebooks shall be transmitted to the Engineer for inclusion into the project records before final project acceptance. All survey records shall be stamped with the seal of and signed by the P.E. or L.S. identified in section 1.01.

End of Section

SECTION 02050 - SELECTIVE DEMOLITION

1.00 GENERAL

1.01 Scope. This work shall consist of selective demolition of all items as scheduled, noted on drawings, specified, or as required for the successful completion of the work.

1.02 Related Work Specified Elsewhere.

Section 01512 - Dust Control
 Section 01560 - Cleaning Up
 Section 02100 - Site Preparation

1.03 Environmental Requirements. Execute demolition in a manner to limit unnecessary dust and noise. Burning of materials is not allowed.

2.00 MATERIALS

2.01 Materials to be Reused. Carefully remove materials, items, equipment, etc. scheduled or noted to be reused in other portions of the work and store them safely for later installation. Repair any damage caused during removal, storage, or installation to the satisfaction of the Owner's Representative.

2.02 Materials to be Removed. Items which are removed shall remain the property of the Owner unless noted otherwise. All unsuitable material as determined by the Owner's Representative shall be removed and legally disposed of off-campus at the expense of the Contractor.

3.00 METHODS AND PROCEDURES

3.01 Preparation.

- A. Building Occupancy. Carry out demolition work to cause as little impact and inconvenience to occupants as possible. Notify building occupants prior to start of demolition work.
- B. Weather protection. Erect waterproof closures for exterior openings, and construct other weather protection as necessary to protect the work.
- C. Dust Protection. Erect and maintain dust proof partitions as required to prevent spread of dust, fumes, and smoke to occupied portions of buildings. On completion, remove partitions and repair damaged surfaces to match adjacent surfaces.

3.02 Existing Utility Services. Disconnect, remove, and cap existing utility services within the area of demolition. Provide suitable cap or stub of equal or better quality to the existing utility service. Identify service lines and place markers to indicate the location of the disconnected service. Record identity of service lines and capping locations on project record drawings.

3.03 Site Demolition. Remove existing site improvements as indicated. Cut existing pavement to a straight line with a masonry saw when pavement removal is required as part of the work.

3.04 Clean-Up. During demolition operations, keep premises free from accumulations of dust and construction debris. At completion of work, remove rubbish, waste material, tools, etc. and leave premises clean and ready for subsequent work. Promptly remove rubbish, waste material, and construction debris from site and legally dispose of off-campus at the expense of the Contractor.

End of Section

SECTION 02100 - SITE PREPARATION**1.00 GENERAL**

- 1.01 Scope. This Work shall consist of furnishing all labor, equipment, materials and miscellaneous items for the removal and satisfactory disposal or abandonment for all fences, signs, structures, old pavements, roads, sidewalks, retaining walls, utilities, and any other obstructions. It shall also include salvaging of designated materials and backfilling the resulting trenches, holes, and pits.

This Work shall include sawing concrete and asphalt in close conformity with the dimensions of these Specifications to create lines of weakness to ease controlled breaking for removal.

- 1.02 Related Work Specified Elsewhere.

Section 01512 - Dust Control

Section 02050 - Selective Demolition

2.00 MATERIALS

Not applicable.

3.00 METHODS AND PROCEDURES

- 3.01 General. The Contractor shall remove and dispose of all signs, structures, fences, old pavements, abandoned pipelines, and other obstructions. All salvageable materials noted shall be removed, without unnecessary damage, in sections or pieces that may be easily transported and stored.

- 3.02 Disposal. Unusable material shall be legally disposed of off-campus at the expense of the Contractor.

Where portions of structures are to be removed, the remaining portions shall be prepared to fit new construction. The work shall be done according to Drawings, and in such manners that materials to be left in place shall be protected from damage; all damage to portions of structures to remain in place shall be repaired by the Contractor at his expense. Reinforcing steel projecting from the remaining structure shall be cleaned and aligned to provide bond with new extension.

- 3.03 Salvage. Salvage all items shown on the Drawings. During demolition, Owner or his representatives may designate additional materials to be salvaged rather than disposed. All salvage materials shall be removed from the job site by the Contractor and stored at a site to be designated by the Owner.

- 3.04 Pipe to be left in place. All small metal pipe and metal culverts shall have the ends crushed and crimped back where possible. The ends of all masonry and plastic pipe products shall be completely back-filled with concrete or grout a minimum of 18" or one pipe diameter, whichever is greater. All headwalls and appurtenances shall be removed. Where shown on the Drawings, pipe shall be backfilled their full length. Abandoned irrigation pipe shall be removed by the Contractor.

- 3.05 Sawing of Concrete. The sawing of concrete shall be done carefully, and all damages to concrete remaining in place, due to Contractor's operations, shall be repaired by the Contractor at his expense. An effective dust control method must be used throughout concrete sawing operations. The minimum depth of saw cut in concrete shall be 2 inches or to the depth of the reinforced steel, whichever occurs first, unless otherwise designated.

- 3.06 Safety. Operations that may damage or constitute a hazard to the traveling public will not be permitted.

- 3.07 Removal of Culverts and Other Drainage Structures. Culverts and other drainage structures in areas under traffic use shall not be removed until satisfactory arrangements have been made to accommodate traffic.

Where portions of existing structures lie wholly or in part within the limits of a new structure, they shall be removed as necessary to accommodate the construction of the proposed structure.

- 3.08 Removal of Pipe. Pipes indicated on the Drawings to be removed for salvage and reuse shall be carefully removed, cleaned and every precaution taken to avoid damage to the pipe. Removal of pipe shall include all appurtenances. Pipe to be salvaged shall be taken to the Owner's designated storage yard. The Contractor shall replace, at his expense, all pipe lost or damaged due to negligence, improper storage or improper construction techniques.
- 3.09 Removal of Pavement, Sidewalks, Curbs, etc. All concrete pavement, sidewalks, curbs, gutters, etc., designated for removal, shall be broken into pieces, the size of which shall not exceed approximately 400 pounds or 3 square yards of surface area, and shall be disposed of in a suitable manner. Where old concrete construction abuts new concrete construction, edges of pavement sidewalks, curbs, etc., to be left in place shall be sawn to a true line with a vertical face.
- Asphalt and bituminous pavements to be cut to the full depth of pavement with a vertical face in a straight line parallel to the limit of excavation. Cuts shall be made with flat blade air hammer or saw, or as approved in writing by Engineer, so as to provide a straight, true cut. Concrete pavements, including curbs, gutters and sidewalks, to be saw cut to the full depth of pavement with a vertical face in a straight line parallel to the limit of excavation. An effective method of dust control shall be utilized throughout concrete sawing operations. Feathering of new asphalt pavements onto old pavements will not be permitted under this Contract.
- 3.10 Abandonment of Manholes, Catch Basins, Inlets, etc. Remove all portions of structure to 12 inches below finish grade. Fill all voids with concrete or Class 1 Structure Backfill (95% density). Backfill to surface with concrete, Class 6 aggregates and/or bituminous asphalt or topsoil to match final surface treatment.

End of Section

SECTION 02140 - DEWATERING

1.0 GENERAL

- 1.01 Scope. The Contractor shall furnish all equipment and materials and shall perform all work necessary to dewater the pipe trenches and structure foundations during construction, and to protect the completed portions of work done under this Contract from damage by normal or flood flows of the rivers, rain, snow melt or other sources of water.

- 1.02 Related Work Specified Elsewhere.

Section 01565 – Water and Erosion Control

- 2.00 MATERIALS.

Not applicable.

- 3.00 METHODS AND PROCEDURES

- 3.01 General. The Contractor shall divert, intercept, pump and otherwise effectively prevent water from entering and shall remove seepage from pipe trenches and structure foundations so as to maintain them free of standing water during the course of construction.

End of Section

SECTION 02220 - EXCAVATION, EMBANKMENT, AND COMPACTION

1.00 GENERAL

1.01 Scope. Work to be performed under this section shall include all labor, equipment, materials and miscellaneous items necessary to perform all clearing and grubbing, excavation, backfilling, compacting, testing and related work not specified elsewhere, as shown on the Drawings and required by the Specifications.

1.02 Related Work Specified Elsewhere.

Section 01410 - Testing
Section 02230 - Embedment and Base Course Aggregate
Section 02920 - Topsoiling
Section 03300 - Cast-In-Place Concrete

1.03 Reference Standards.

A. State of Colorado, Division of Highways "Standard Specifications for Road and Bridge Construction", latest edition.

1.04 Field Conditions.

A. Existing Utilities. Underground utility locations are approximate only and may prove to be inaccurate. The Contractor is responsible for verification of the existence, location and protection of all utilities within the construction limits. In the event of damage to any existing utility, the Contractor shall be solely responsible for the repair and payment for repair of all such damage.

Before commencing with work, the Contractor shall notify all public and private companies who may have utilities within the project limits. The Contractor shall coordinate with these entities all excavation performed. The Contractor shall obtain all permits required by utility owners.

The Contractor shall make arrangements for and pay all costs for relocation of utilities requiring relocation as indicated on the Drawings. Should utility obstructions, not shown on the Drawings, be encountered and require relocation, the Contractor shall notify the Owner and the Engineer and shall make arrangements necessary for such relocation.

B. Existing Improvements. The Contractor shall restore or protect from damage all existing improvements encountered in performance of the work. Improvements damaged as a result of this work shall be restored to original condition or better, as determined by the Engineer. Adjacent property shall be protected by the Contractor from any damage. The Contractor shall be held solely liable for any damage to adjacent property and shall be responsible for all costs resulting from repair of such damage.

C. Soil Conditions. It shall be the responsibility of the Contractor to examine soil conditions and characteristics, including the presence of groundwater that will be encountered within the limits of construction.

1.05 Protection of Work.

A. Safety. All excavations shall be protected by barricades, lights, signs, etc. as required by governing federal, state and local safety codes and regulations.

B. Sheet piling, shoring and bracing. Except where banks are cut back on a stable slope, provide and maintain sheet piling, shoring and bracing systems necessary to protect adjoining grades and structures from caving, sliding, erosion or other damage, and suitable forms of protection against bodily injury, all in accordance with applicable codes and governing authorities. Remove sheet piling and shoring systems as excavations are backfilled in a manner to protect the construction or other structures, utilities or property. Do not remove any sheet piling after backfilling.

SECTION 02220 - EXCAVATION, EMBANKMENT, AND COMPACTION

Sheeting and shoring systems shall be structurally designed and sufficiently braced to provide necessary restraining of retained backfill. Prior to installation of such systems, methods of installation and materials proposed shall be discussed with and approved by Engineer. All systems shall be in strict compliance with local, state and federal safety regulations. Contractor is solely liable for non-compliance.

C. Site Drainage. Excavation to be protected from surface water drainage at all times.

- 1.06 Blasting. No blasting shall be permitted without written consent of the Engineer. Blasting shall be done only after Engineer receives permission from the appropriate governmental authority(ies). Blasting shall be performed only by properly licensed, experienced individuals and in a manner such that no damage to any property or persons will occur due to either the blast or debris.

Contractor shall provide proof of insurance as required by these Specifications, the governing authority or as required by Engineer prior to any blasting. All damage as the result of blasting shall be repaired, at the Contractor's expense, to the satisfaction of the Engineer. All earth or rock loosened by blasting shall be removed from excavations prior to proposed construction.

- 1.07 Construction in Streets. When construction operations are located within streets, make provisions at cross streets and walks for free passage of vehicles and pedestrians. Do not block streets or walks without prior approval.

2.00 MATERIALS

All materials for construction fills and backfills shall meet specified requirements for gradation and other factors defining suitability for the intended use. All classes of suitable material shall be free from perishable matter, debris, frozen material and stones and/or cemented pieces larger than permitted by the specified gradation. Classification of materials shall be as follows:

- 2.01 Excavation. Excavation shall consist of the excavation of all materials of whatever character required for the Work, obtained within the site, including surface boulders and excavation for ditches and channels and not being removed under some other item.

- 2.02 Embankment. The source for general embankment material shall meet the following recommendations, summarized as follows:

- A. Organic matter such as heavy weed growth shall be stripped from the surface of the material stockpiles.
- B. The stockpiled material shall be screened to produce a maximum particle size of six (6) inches for the embankment fill material. Organic matter, other deleterious material, and construction debris/trash shall be discarded during the screening operation. Concrete and asphalt debris may be utilized for the embankment material.
- C. A sufficient volume of screened material shall be produced and stockpiled to facilitate development of moisture content/maximum dry density (Proctor) testing prior to placement and compaction of the material.
- D. The screened embankment materials shall be thoroughly moisture conditioned to +/- 2% of the optimum moisture content as determined by ASTM D1557, Modified Proctor Test.
- E. The embankment shall be placed in maximum eight (8) inch loose lift thicknesses.
- F. The embankment material shall be compacted to at least ninety (90) percent of the maximum dry density as determined by ASTM D1557, Modified Proctor Test.

- 2.03 Topsoil. The source for topsoil material shall consist of selectively excavated, loose, friable loam reasonably free of admixtures of sub-soil, refuse, stumps, roots, rocks, brush, weeds or other material which would be detrimental to the proper development of vegetative growth; See Section 02920 - Topsoiling.

3.00 METHODS AND PROCEDURES

3.01 Clearing and Grubbing.

A. Preservation of Existing Conditions.

The Engineer will establish right-of-way lines and construction lines. All trees, shrubs, plants and other things shall remain unless otherwise specified for removal.

B. Clearing and Grubbing.

Clear and/or grub all surface objects and all trees, stumps, roots and other protruding obstructions, not designated to remain, including mowing, as required, except undisturbed stumps and roots and non-perishable solid objects which will be a minimum of two feet below subgrade or slope embankment. Outside cut or fill limits, but within construction limits, stumps may be left at finish grade if allowed by Engineer. Except in areas to be excavated, backfill stump holes and other holes from which obstructions are removed, with embankment material and compacted in accordance with Section 3.05.

C. Disposal.

Unusable or unsuitable material shall be legally disposed of off-site at the expense of the Contractor.

D. Scalping.

Scalp areas where excavation or embankment is to be made. Scalping shall include the removal of material such as brush, roots, sod, grass, residue or agricultural crops, sawdust, and other vegetable matter from the surface of the ground.

E. Hedges.

Hedges shall be pulled or grubbed in such a manner as to assure complete and permanent removal. Scattered hedge or shrubs not classified as hedge shall be removed as specified for hedge.

F. Topsoil.

Strip topsoil from all areas to be disturbed by construction. Topsoil to be stockpiled separately from excavated materials. See Section 02920 - Topsoiling.

3.02 Construction Requirements. The excavation and embankments required shall be finished to smooth and uniform surfaces. Materials shall not be wasted without permission of the Engineer. The Engineer reserves the right to change grade lines, cut slopes or fill lines during the progress of the work.

3.03 Excavation. Material outside of the limits of excavation will not be disturbed. Prior to beginning excavation operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with these Specifications. The Contractor shall not excavate beyond the dimensions and elevations established. Common excavation shall include all materials of whatever nature encountered in the work for construction of excavations to the lines and grades called for on the Drawings. Structure excavation shall include all earthwork required for the construction of structures to the lines and grades called for on the Drawings. If any areas are inadvertently over-excavated, fill such over-excavation with embankment material and compact in accordance with Section 3.05.

A. Tolerances. In those areas upon which a subbase material is required, or upon which a structure is to be constructed directly, deviation of not more than 1 inch shall be permitted when tested with a 16-foot straight edge. Deviation from grade shall not exceed 1 inch at any point. In those areas upon which a base course material is required, deviation of not more than 0.04 foot shall be permitted when tested with a 16-foot straight edge. Deviation from grade shall not exceed 0.04 foot at any point. In those areas where no additional construction, other than topsoil addition, will occur, the finished surface shall be smooth and shall not deviate from grade by more than 0.08 foot at any point.

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- B. Groundwater Control. Contractor to maintain facilities on site to remove all groundwater from excavated area and keep water below the bottom of the excavation to a point such that a firm base for equipment or concrete installation exists. Facilities shall be maintained until all backfilling is in place at least 24 inches above anticipated water levels before water removal. All water removal shall be subject to approval by the Engineer. Removal of water by bucketing, sump or trench diversions, intermittent pumping, or sump or submersible pumps is considered incidental to excavation work.
- C. Stockpile Excavated Material. Excavated material to be stockpiled so as not to endanger the work or public safety. Maintain existing vehicular and pedestrian traffic with minimum disruption. Maintain emergency access and access to existing fire hydrants and water valves. Maintain natural drainage courses and street gutters. Backfill material to be segregated from stockpiled topsoil and unusable backfill materials.
- D. Over-excavation. Whenever the site is over-excavated more than 0.1' to eliminate point bearing by rocks or stones beneath proposed structures or when grade tolerances are exceeded, the Contractor is to re-establish grade using Class 1 Backfill (CDOT Section 703.08 - Class 1). Compaction shall be to 95% maximum density. All work to re-establish grade shall be at the Contractor's expense.
- E. Unstable Materials. Materials which are not capable of supporting superimposed loadings are defined as unstable materials. Should unstable materials be encountered during excavation, immediately notify Engineer. If, in the opinion of the Engineer, unstable soil excavation is required and the Contractor could not have reasonably been expected to discover the existence of such materials during his site investigation, then a contract price for Unstable Soil Excavation shall be negotiated between Owner & Contractor. No payment shall be made for materials excavated prior to notification of the Engineer and negotiation of payment for extra work.
- F. Rock Excavation. Rock excavation shall be defined as removal of boulders in excess of three (3) cubic yards or solid or fractured rock, which requires techniques, such as blasting or jacking for removal, other than those which are being employed by the Contractor or are normally used in excavation, such as use of backhoes, trenchers, drag lines, etc. Should unanticipated rock conditions be encountered, immediately notify the Engineer. If in the opinion of the Engineer, rock excavation is required and the Contractor had in fact made a diligent and determined effort to remove the material using normal excavation procedures as stated above and the Contractor could not have reasonably been expected to determine the existence of such material during his site investigation, then a contract price for Rock Excavation shall be negotiated between the Contractor and the Owner. No payment shall be made for excavation performed prior to determination of a negotiated price.

Rock shall be removed to a 4" depth below grade. In addition, all rock loosened during jacking, blasting, etc. shall be removed from the site. All over-excavation shall be replaced as specified in Subsection 3.03, D.

- G. Disposal of Excess Excavation. Unless specified otherwise on the project plans, all excavated materials are to be screened on the project site to a 3/4 inch minus size. The screened material shall be transported and stockpiled at a designated topsoil storage area on the FLC campus. The Owner reserves the right to reject any screened materials deemed unsuitable for topsoil upon the sole discretion of the Owner's Representative. All rejected material, debris from the screening process, and all other unsuitable materials including concrete and asphalt rubble, stumps, rocks, and other construction debris shall be legally disposed of off campus at no additional cost to the Owner.

- 3.04 Embankment and Backfilling. Do not begin embankments until construction below grade has been approved, underground utility systems have been inspected, tested and approved and trash and debris have been cleaned from the excavation.

Place approved excavated material in successive uniform maximum loose layers not exceeding 6 inches for the full width of the cross-section in all accessible areas. Place material in successive uniform loose layers not exceeding 4 inches in areas not accessible or permitted for the use of self-propelled rollers or vibrators. Do not place fill on muddy or frozen subgrade, or until subgrade is approved by the Engineer.

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Plow, step, or bench sloped surfaces steeper than 4 to 1 on which fill or backfill is to be placed in such a manner that fill material will adequately bond with existing surfaces. Scarify all surfaces to receive backfill to a depth of 6" before filling. Construct fills and embankments to the lines and grades indicated on the Drawings within tolerances stated in Section 3.03, A above. Use suitable materials removed from the excavation prior to obtaining material from borrow areas. Where otherwise suitable material is too wet, aerate, dry or blend to provide the moisture content specified for compaction.

- 3.05 Compaction. During placing and/or compacting operations of earth or earth and rock mixtures, the moisture content of materials in the layers being compacted shall be near optimum and uniform throughout the layer. In general, maintain the moisture content of the material being placed and compacted within 2% of optimum condition as determined as ASTM Standard D698.

- A. Compaction Equipment. Perform all compaction with approved equipment well suited to location and material being compacted. Use heavy vibratory rollers or sheeps-foot rollers where heavy equipment is authorized. Do not operate heavy equipment closer to structures than a horizontal distance equal to height of backfill above bottom of structure foundation. Compact remaining area with hand tampers suitable for material being compacted. Place and compact backfill around pipes with care to avoid damage.

Compact fill materials to the following densities at optimum moisture content based on ASTM D698 or AASHTO T99:

1. Subgrade: 95%
2. Structure fill under or within 5' horizontally of all concrete structures: 95%.
3. Backfill beneath or within 5' horizontally or within the area defined by a line extended at an angle of 1:1 of existing or proposed pavements, roadways, sidewalks, curbs, utility lines or other improvements: 95%
4. Backfill within public or designated rights-of-way: 90%
5. Backfill within undeveloped, green or undesignated area: 90%.

- B. Maintenance. Contractor to maintain all embankments in satisfactory condition during the extent of the contract and warranty period. All surface deterioration determined to be the responsibility of the Contractor and all settlement shall be repaired at once by the Contractor upon notice by the Owner. All costs for repair and all liability as a result of surface deterioration or settlement shall be the responsibility of the Contractor.

- 3.06 Proof Rolling. Proof rolling with a heavy rubber-tired roller will be required as designated on the plans or when ordered. Proof rolling shall be done after specified compaction has been obtained. Areas found to be weak and those areas which failed shall be ripped, scarified, wetted if necessary and recompacted to the requirements for density and moisture at the Contractor's expense. Equipment to be used for proof rolling may also be fully loaded, tandem axle dump truck or water truck or rubber-tired roller with equivalent loading characteristics.

- 3.07 Surface Restoration. All existing surface improvements and site conditions disturbed or damaged during construction are to be restored to a condition equal to pre-construction condition. All restoration costs are considered incidental to excavation and backfill.

- A. Improvements. Replace, repair or reconstruct all improvements as required. Work will not be accepted until restoration is accepted by Engineer and all affected property owners.
- B. Final Grading. The Contractor is to re-establish existing final grade or finish to final grades as modified and shown on the Drawings. The Contractor is to backfill to proper subgrade elevation with backfill material to allow placement of surface improvements or materials.
- C. Roadways and Sidewalks. All roadways and sidewalks to be restored to original condition with material types as removed. Materials and methods to conform to Colorado Division of Transportation Standard Specifications for Road and Bridge Construction, current edition. Additional requirements are:

SECTION 02220 - EXCAVATION, EMBANKMENT, AND COMPACTION

1. Minimum base course material on gravel roadways or minimum depth gravel beneath hard surface roadways to be 8".
 2. Minimum asphalt pavement surfacing to be 3".
 3. Minimum concrete pavement surfacing to be 6".
- D. Topsoil. Place excavated topsoil from the roadway or from pits directly upon constructed cut and fill slopes without the use of stockpiles whenever conditions and the progress of construction will permit. Do not place topsoil until the areas to be covered have been properly prepared and grading operations in the area have been completed. Place and spread topsoil at locations and to the thickness shown on the plans. Key to the underlying material by the use of harrows, rollers or other equipment suitable for the purpose. Apply water to the topsoil at the locations and in the amounts designated. Apply in a fine spray by nozzles or spray bars in such manner that it will not wash or erode the topsoil areas. All loose exposed rock larger than six inches shall be removed from slopes that are to receive topsoil.

4.00 FIELD QUALITY CONTROL

Field Quality Control shall be performed as per Section 02221 of this set of Specifications.

End of Section

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTION

1.00 GENERAL

1.01 Scope. Work to be performed under this section shall include all labor, equipment, materials and miscellaneous items necessary to perform all excavation, backfilling and compaction of underground piping, conduits, and appurtenances shown on the Drawings and specified herein.

1.02 Related Work Specified Elsewhere.

Section 01410 - Testing
Section 02230 - Embedment and Base Course Aggregate
Section 02810 - Irrigation System
Section 02920 - Topsoiling

1.03 Reference Standards.

A. State of Colorado Division of Highways "Standard Specifications for Road and Bridge Construction," latest edition.

1.04 Field Conditions.

A. Existing Utilities. Underground utility locations are approximate only and may prove to be inaccurate. The Contractor is responsible for verification of the existence, location and protection of all utilities within the construction area. In the event of damage to any existing utility, the Contractor shall be solely responsible for the repair and payment for repair of all such damage.

Before commencing with work, the Contractor shall notify all public and private companies who may have utilities within the project limits. The Contractor shall coordinate with these entities all excavation performed. The Contractor shall obtain all permits required by utility owners.

The Contractor shall make arrangements for and pay all costs for relocation of utilities requiring relocation as indicated on the Drawings. Should utility obstructions, not shown on the Drawings, be encountered and require relocation, the Contractor shall notify the Owner and the Engineer and shall make arrangements necessary for such relocation.

B. Existing Improvements. The Contractor shall restore or protect from damage all existing improvements encountered in performance of the work. Improvements damaged as a result of this work shall be restored to regional condition or better, as determined by the Engineer. Adjacent property shall be protected by the Contractor from any damage. The Contractor shall be held solely liable for any damage to adjacent property and shall be responsible for all costs resulting from repair of such damage.

C. Soil Conditions. It shall be the responsibility of the Contractor to examine soil conditions and characteristics, including the presence of groundwater that will be encountered within the limits of construction.

1.05 Protection of Work.

A. Safety. All excavation shall be protected by barricades, lights, signs, etc., as required by governing federal, state and local safety codes and regulations.

B. Sheet piling, Shoring and Bracing. Where trench walls are not excavated at a stable slope, the Contractor shall provide and maintain support sufficient to prevent caving, sliding or failure and property or bodily damage. Any damage due to inadequate support shall be repaired at the sole expense of the Contractor. Under normal construction conditions, support shall be removed as work progresses. Support shall remain installed if directed by the Engineer or if pipe does not have sufficient strength to support backfill based on trench width as defined by the sheet piling. Sheet piling shall not be removed after the start of backfilling.

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTION

Use of a movable trench shield or coffin box will not be allowed where pipe strength is insufficient to support backfill as defined by the trench width after the trench shield is removed. The Contractor shall be held solely responsible for any violation of applicable safety standards. Particular attention is called to minimum requirements of OSHA and COSH (Colorado Occupational Safety and Health).

C. Site Drainage. Excavation to be protected from surface water at all times.

- 1.06 Blasting. No blasting shall be permitted without written consent of the Engineer. Blasting shall be done only after Engineer receives permission from the appropriate governmental authority(ies). Blasting shall be performed only by properly licensed, experienced individuals and in a manner such that no damage to any property or persons will occur due to either the blast or debris.

Contractor shall provide proof of insurance as required by these Specifications, the governing authority or as required by Engineer prior to any blasting. All damage as the result of blasting shall be repaired, at the Contractor's expense, to the satisfaction of the Engineer. All earth or rock loosened by blasting shall be removed from excavations prior to proposed construction.

- 1.07 Construction in Streets. When construction operations are located within streets make provisions at cross streets and walks for free passage of vehicles and pedestrians. Do not block streets or walks without prior approval.

2.00 MATERIALS

- 2.01 Embedment Material. Pipe line embedment material shall comply with the appropriate classes as listed below where they are not illustrated in the Construction Drawings:

A. Class A - Use where indicated on the Drawings and where improper trenching or unexpected trench conditions require its use as determined by the Engineer.

Characteristics - Concrete cradle foundation with densely compacted Class 6 aggregate base backfill to 12" above top of pipe, or densely compacted Class 6 aggregate granular foundation with concrete arch cover to 6" above top of pipe.

B. Class B - Use for all plastic, clay and asbestos - cement pipe under normal construction conditions.

Characteristics - Densely compacted Class 6 aggregate or 3/4" screened rock granular foundation of depth shown on Typical Details with densely compacted Class 6 aggregate or 3/4" screened rock to 12" above top of pipe.

C. Class C - Use for all types of pipe not specified under Class B where normal construction conditions exist.

Characteristics - Densely compacted Class 4 aggregate or 3/4" screened rock granular foundation of depth shown on Typical Details with densely compacted Class 4 aggregate or 3/4" screened rock to 12" above top of pipe.

- 2.02 Select Material. Subject to approval by the Engineer, select material shall be allowed in place of the aggregate backfill for Classes B & C embedment.

A. Characteristics - Soil materials free from rocks, clods, and organic material, uniformly graded as follows:

<u>Pipeline Material</u>	<u>Gradation Limits</u>
Plastic, Clay and Asbestos - Cement	3/4 inch max. with less than 15% passing No. 200 sieve
All others	12 inch max. with less than 20% passing No. 200 sieve

- 2.03 Concrete for Embedment. Shall be 2000 psi concrete (28 day compressive strength see Section 03000 - Concrete.), Reinforcement shall conform to ASTM A185, Grade 40, see Section 03200 - Concrete Reinforcement.

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTION

2.04 Backfill Material.

- A. Characteristics - Native materials free from debris, organic matter and frozen material. Uniformly graded sufficient to allow proper compaction.
- B. Gradation - No boulders greater than 6 inch diameter in top 12 inches of backfill.

Generally no boulders greater than 12 inch diameter in remainder of trench. Limited number of boulders not exceeding 24 inch diameter to be allowed at discretion of Engineer provided boulders can be uniformly dispersed and will not interfere with compaction.

3.00 METHODS AND PROCEDURES

3.01 Site Preparation.

- A. Clearing. Remove all vegetation, stumps, roots, organic matter, debris and other miscellaneous structures and materials from work site. Dispose of legally off-site.
- B. Topsoil Removal. Strip existing topsoil from all areas to be disturbed by construction. Topsoil to be stockpiled separately from excavated materials, see Section 02920 - Topsoiling.
- C. Pavement Removal. See Section 02100 - Site Preparation.

3.02 Trench Excavation.

- A. Limits of Excavation. Trenches to be excavated along lines and grades shown on the Drawings, or as modified in the field by the Engineer. Trench widths for pipe loading to be measured 12 inches above top of pipe. If maximum trench width is exceeded, Contractor will provide at his expense, higher strength pipe or special bedding including concrete at the direction of the Engineer. Trench excavation not to be completed more than 100 feet in advance of pipe installation. Backfill to be completed within 100 feet of pipe installation.
- B. Groundwater Control. Contractor to maintain facilities on-site to remove all groundwater from trench and keep water at least 12 inches below the trench bottom to a point such that a firm base for pipe or conduit installation exists. Facilities shall be maintained until all concrete is cured and backfilling is in place at least 24 inches above anticipated water levels before water removal is discontinued; all water removal shall be subject to approval by the Engineer.
- C. Stockpile Excavated Material. Excavated material to be stockpiled so as not to endanger the work or public safety. Maintain existing vehicular and pedestrian traffic with minimum disruption. Maintain emergency access and access to existing fire hydrants and water valves. Maintain natural drainage courses and street gutters. Backfill material to be segregated from stockpiled topsoil and unusable backfill materials.
- D. Excavation for Appurtenances. Excavation to be done in accordance with these Specifications and as shown on the Drawings. Adequate working clearances to be maintained around appurtenances. Provisions for base and bottom preparations shall apply to all appurtenances. Precautions to be taken to maintain trench widths in the vicinity of adjacent pipelines and conduits.

3.03 Bottom Preparation.

- A. Undisturbed Foundation. Where soils are suitable and have adequate strength, bottom to be graded and hand-shaped such that pipe barrel rests uniformly on undisturbed soil. All rocks or stones which may result in a point bearing on the pipe shall be removed.

Undisturbed grades shall be within 0.1 feet tolerance. Soils for final pipe grade placed within these limits shall be fine granular (100% passing No. 4 sieve) or may be native materials, hand compacted to 95% maximum density.

SECTION 02221 - TRENCHING, BACKFILLING AND COMPACTION

- B. Bell Holes. Material shall be removed to allow installation of all fitting and joint projections without affecting placement of pipe.
- C. Over-excavation. Whenever trench is over-excavated to eliminate point bearing by rocks or stones or when undisturbed grade tolerances of 0.1' are exceeded, the Contractor is to re-establish grade using Class 6 aggregate bedding material. Compaction shall be 95% maximum density. All work to re-establish grade shall be at the Contractor's expense.
- D. Unstable Materials. Materials which are not capable of supporting superimposed loadings are defined as unstable materials. Should unstable materials be encountered during excavation, immediately notify Engineer. If, in the opinion of the Engineer, unstable soil excavation is required and the Contractor could not have reasonably been expected to discover the existence of such materials during his site investigation, then a contract price for Unstable Soil Excavation shall be negotiated between Owner and Contractor. No payment shall be made for materials excavated prior to notification of the Engineer and negotiation of payment for extra work.
- E. Rock Excavation. Rock excavation shall be defined as removal of boulders in excess of three (3) cubic yards of solid or fractured rock, which makes hand shaping of the bottom impossible and which requires techniques, such as blasting or jacking for removal, other than those which are being employed by the Contractor or are normally used in trench excavation, such as use of backhoes, trenchers, drag lines, etc. Should unanticipated rock conditions be encountered, immediately notify the Engineer. If in the opinion of the Engineer, rock excavation is required and the Contractor has in fact made a diligent and determined effort to remove the material using normal excavation procedures as stated above, and the Contractor could not have reasonably been expected to determine the existence of such material during his site investigation, then a contract price for rock excavation shall be negotiated between the Contractor and the Owner. No payment shall be made for excavation performed prior to determination of a negotiated price. Rock shall be removed to a 4" depth below grade. Additionally, all rock loosened during jacking, blasting, etc., shall be removed from the trench. All over-excavation shall be replaced as specified in Subsection 3.03, C.

3.04 Backfilling.

- A. Tamping Equipment. Except immediately next to the pipe, mechanical or air operated tamping equipment to be used. Hand equipment such as T-bar to be used to pipe if necessary. Care to be taken when compacting under, alongside and immediately above pipe to prevent crushing, fracturing or shifting of the pipe. The Contractor is to note densities required for materials being backfilled and shall use appropriate approved equipment to obtain those densities.

Wheel rolling is not considered to be an adequate compaction technique to meet these Specifications and will not be allowed. Where 85% compaction is required, wheel rolling may be considered. Before acceptance, the Contractor shall backfill a portion of the trench and pay for density testing to verify adequacy of the proposed backfill techniques.

A hydro hammer may be allowed to obtain the specified density up to 4' in depth. The Contractor will be required to re-excavate those areas that have been tamped so that density tests can be taken to insure that the specified density is being obtained full depth.

- B. Moisture Control. Generally maintain moisture of backfill material with $\pm$ 2% of optimum moisture content as determined by ASTM D698. Maintain closer tolerances as needed to obtain densities required.
- C. Compaction. Maximum density based on ASTM D698 or AASHTO T99.
 - 1. Bedding Material, including material used for over-excavation of any kind: 95%
 - 2. Select Material: 95%
 - 3. Backfill beneath existing or proposed pavement, roadways, sidewalks, curbs, utility lines and other improvements or within 5' horizontally of such improvements: 95%
 - 4. Backfill within public or designated right-of-way: 90%

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5. Backfill within undeveloped, green or undesignated area: 90%
 - D. Placing Backfill. The maximum loose lifts of backfill material to be as follows: use smaller lifts where necessary to obtain required densities:
 1. Bedding and select material: 6" (or see Section 3.03A).
 2. Backfill Material: 24" where 95% compaction required. 48" where less than 95% compaction required.
 - E. Backfilling Appurtenances. Backfilling to be done generally at the same time as adjacent pipelines. Backfilling procedure to conform to this section. Use special techniques or materials as shown on drawings.
 - F. Disposal of Excess Excavation. Contractor to dispose of excess excavation legally off-site. The Owner shall have the right to elect to have the excess excavation disposed of at a designated site within the work limits. Excavation may be wasted on-site only if approved by the Engineer. Disposal in any case shall be the sole responsibility of the Contractor.
 - G. Maintenance of Backfill. Contractor to maintain all backfill in a satisfactory condition during the extent of the contract and warranty period. All surface deterioration determined to be the responsibility of the Contractor and all settlement shall be repaired at once by the Contractor upon notice by the Owner. All costs for repair and all liability as a result of surface deterioration or settlement shall be the responsibility of the Contractor.
 - H. Clay Barrier Water Stops. Because of the presence of ground water, a clay barrier may be required to be installed full depth in trench in place of all bedding material and backfill. This barrier shall be full depth and two feet thick and installed every 500 lineal feet of trench. All such work, when not specifically called for on the Drawings, shall be done at a price to be negotiated between Owner and Contractor prior to commencement of Work.
- 3.05 Surface Restoration. All existing surface improvements and site conditions disturbed or damaged during construction shall be restored to a condition equal to pre-construction condition. All restoration costs are considered incidental to excavation and backfill.
- A. Improvements. Replace, repair or reconstruct all improvements as required. Work will not be accepted until restoration is accepted by Engineer and all affected property owners. Improvements include, by example, other utilities, culverts, structures, curb and gutter, pavement, sidewalks, etc.
 - B. Final Grading. The Contractor is to re-establish existing final grade or finish final grades as modified and shown on the Drawings. The Contractor is to backfill to proper subgrade elevation with backfill material to allow placement of surface improvements or materials.
 - C. Roadways and Sidewalks. All roadways and sidewalks to be restored to original condition with material types removed. Materials and methods to conform to Colorado Division of Transportation Standard Specifications for Road and Bridge Construction, current edition. Additional requirements are:
 1. Minimum base course material on gravel roadways or minimum depth gravel on hard surface roadways to be 6".
 2. Minimum bituminous surfacing to be 3".
 3. Minimum concrete paving to be 6".
 - D. Landscape Areas. Restore all disturbed areas as specified in Section 02950 - Seeding Turf and Dryland Grasses, and Section 02951 - Sod Installation.
- 4.00 FIELD QUALITY CONTROL
- 4.01 Compaction. It should be fully understood that it will be the sole responsibility of the Contractor to achieve the specified densities for all embedment and backfill material placed. Contractor will be responsible for ensuring

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that correct methods are being used for the placement and compaction of said materials. Correct backfill methods include, but are not limited to:

- A. Use of proper equipment for existing soil condition encountered.
- B. Moisture content of existing soils; determination if water should be added or if soil should be air dried to reduce moisture content.
- C. Thickness of backfill lift shall not exceed 8" (uncompacted).
- D. Contractor may, at his own expense, have an approved geotechnical engineer monitor the methods of backfill and compaction used to ensure that the desired densities are being obtained.
- E. Inspection and testing will be performed as described below. Testing will be conducted as a quality control check to verify the Contractor's compliance with the standards indicated in the Specifications.

4.02 Inspection and Testing. Inspection and testing to be performed at the interval described below and at the direction of the Engineer. Contractor to cooperate fully with all persons engaged in testing. Contractor to excavate as required to allow testing. Contractor to backfill all test excavations in accordance with these Specifications. Contractor shall notify engineer of construction sequence with 24 hours notice when required testing will be needed. Testing will be completed and paid for by others.

4.03 Density Testing and Control.

- A. Reference Standards. Density/moisture relationships to be developed for all soil types encountered according to ASTM D698 or AASHTO T99.
- B. Field Testing. Testing for density during compaction operations to be done in accordance with ASTM D2922 using nuclear density methods.
- C. Frequency of Testing. Minimum of one (1) test every 250' trench per lift or as directed by Engineer. Contractor to excavate to depths required by Engineer for testing and backfill test holes to density specified. Testing to be paid for by Owner.
- D. Retesting. In the event of failure to meet compaction criteria, Contractor shall re-excavate and backfill at direction of Engineer. All retesting to be paid for by Contractor and to be performed by testing firm approved by the Engineer.

End of Section

SECTION 02230 - EMBEDMENT AND BASE COURSE AGGREGATE**1.00 GENERAL**

- 1.01 Scope. This work shall consist of furnishing and placing one or more courses of aggregate on the prepared surface in accordance with these Specifications in reasonably close conformity with the lines, grades and typical cross sections shown on the drawings or established by the Engineer in the field.

1.02 Related Work Specified Elsewhere.

Section 01410 - Testing

Section 02220 - Excavation, Backfilling, and Compaction

Section 02221 - Trenching, Backfilling, and Compaction

Section 02520 - Concrete Paving, Sidewalk, and Curb and Gutter

Section 03300 - Cast-in-Place Concrete

1.03 Reference Standards.

- A. State of Colorado Division of Highways "Standard Specifications for Road and Bridge Construction," latest edition.

1.04 Submittals.

- A. Aggregates. Certified statement from independent testing laboratory, acceptable to Engineer, of material compliance.

2.00 MATERIALS

Aggregate used for pipeline bedding, base course and subbase course and specified by class in other sections of this specification shall conform to the graduation schedule shown below.

CLASSIFICATION TABLE FOR AGGREGATE BASE COURSE

Percentage by Weight Passing Square Mesh Sieves							
Sieve Size	LL not greater than 35			LL not greater than 30			
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
4 inch	...	100	...	...	...	...	...
3 inch	...	95-100	...	...	...	...	...
2-1/2 inch	100	...	...	...	...	...	...
2 inch	95-100	...	...	100	...	...	...
1-1/2 inch	...	...	...	90-100	100	...	...
1 inch	...	...	...	...	95-100	...	100
3/4 inch	...	...	...	50-90	...	100	...
No. 4	30-65	...	...	30-50	30-70	30-65	...
No. 8	...	...	...	...	...	25-55	20-85
No. 200	3-15	3-15	20 MAX	3-12	3-15	3-12	5-15

NOTE: Class 3 materials shall consist of bank or pit run material approved by the Engineer and screened to a maximum 4" size.

3.00 METHODS AND PROCEDURES

- 3.01 Placing. The base course material shall be placed on the previously prepared subgrade at the locations and in the proper quantities to conform to the typical cross sections as shown on the Drawings and as directed by the Engineer. Placing and spreading shall be done by means of spreader machine, moving vehicle, motor grader or

other approved equipment methods. The material shall be placed without segregation. Any segregated areas shall be removed and replaced with uniformly graded material at the Contractors expense.

The base material may be placed in lifts of up to 6 inches, providing that after compaction, uniform density is obtained throughout the entire depth of the lift. If the required depth exceeds 6 inches, it shall be placed in two or more lifts of approximately equal thicknesses. If uniform density cannot be obtained by 6 inch lifts, the maximum lift shall not exceed 4 inches in final thickness.

- 3.02 Compacting. Rolling will be continuous until the base material has been compacted to not less than 95% of maximum density as determined by ASTM D698 or AASHTO T99. Water shall be uniformly applied as necessary during compaction to obtain optimum moisture content and to aid in consolidation. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates are firmly keyed.

The finished base course surface shall be smooth and free of ruts and irregularities and true to grade and crown as shown on the plans or as directed by the Engineer. The final surface shall be finished with a surface smoothness tolerance of .02 ft., measured as vertical ordinate from the face to a ten-foot straight edge. The base course shall be maintained in this condition by watering, drying, rolling, or blading as necessary, or as the Engineer may direct, until the surface material is placed.

4.00 QUALITY CONTROL - FIELD

- 4.01 Inspection and Testing. Inspection and testing to be performed at the interval described below and at the direction of the Engineer. Contractor to cooperate fully with all persons engaged in testing. Contractor to excavate as required to allow testing. Contractor to backfill all test excavations in accordance with these Specifications. Contractor shall notify engineer of construction sequence with 24 hours notice when required testing will be needed. Testing will be completed and paid for by others.

4.02 Density Testing and Control.

- A. Reference Standards. Density/moister relationships to be developed for all soil types encountered according to ASTM D698 or ASSHTO T99.
- B. Field Testing. Testing for density during compaction operations to be done in accordance with ASTM D2922 using nuclear density methods.
- C. Frequency of Testing. Conduct a minimum of one test for each layer of specified depth of fill or backfill as follows:
 - 1. Foundations: For each 100 lineal feet or less of trench.
 - 2. Slab on Grade: For each 2,000 square feet or less of building area.
 - 3. Pavement and Walks: For each 2,000 square feet or less.
 - 4. All Other Areas: For each 5,000 square feet or less.
 - 5. Utility Trenches: For each 250 lineal feet or less of trench.
- D. Re-testing. In the event of failure to meet compaction criteria, Contractor shall re-excavate and re-backfill at direction of Engineer. All re-testing to be paid for by Contractor and to be performed by testing firm approved by the Engineer.

End of Section

SECTION 02520 - CONCRETE PAVING, SIDEWALK, AND CURB AND GUTTER

1.00 GENERAL

- 1.01 Scope. This Work shall include furnishing all materials, labor, equipment and miscellaneous items necessary for the construction of concrete curb, gutter, sidewalk, handicap ramps, and other concrete flatwork or any combination thereof, all in accordance with these Specifications and in close conformity with the lines, grades, and typical sections as shown on the plans or established in the field.

1.02 Related Work Specified Elsewhere.

Section 02220 - Excavation, Backfilling, and Compaction

Section 02230 - Embedment and Base Course Aggregate

Section 03100 - Concrete Formwork

Section 03200 - Concrete Reinforcement

Section 03300 - Cast-in-Place Concrete

2.00 MATERIALS

The materials shall conform to the requirements specified in the following:

Section 03000 - Concrete

Section 03200 - Concrete Reinforcement

- 2.01 Joint Filler. Pre-molded, preformed conforming to AASHTO M33 to the full depth of the section. See Section 3.05.

- 2.02 Concrete. 28-day compressive strength of 4,000 psi unless specified otherwise. See Section 03300 - Cast-In-Place Concrete.

- 2.03 Storm Water Curb Openings. When required, storm water curb openings shall be cast iron Neenah Foundry #R3262-3 or approved equal.

- 2.04 PVC Sleeves. Install minimum 6" diameter Class 200 PVC sleeves when required at locations as shown on the drawings or as directed by the Engineer. Sleeves shall be installed at minimum 18" depth below paving, and shall extend 2' past edge of paving.

3.00 METHODS AND PROCEDURES

- 3.01 Excavation. Excavation shall be made to the required depth and width to permit the installation and bracing of the forms. The foundations shall be shaped and compacted to a firm even surface conforming to the section shown on the plan. Material determined to be unsuitable or non-compact by the Engineer will be removed and replaced.

- 3.02 Forms. Forms shall be wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in alignment both horizontally and vertically until removal. Satisfactory slip forms may be used when approved. Use of curbing machine will be permitted providing line and grade tolerances can be met. Steel plates that can be shaped to the desired radius shall be used on all short radii. Open joints shall be formed with a steel separator plate conforming to the section being installed. Oil and clean all forms prior to placement of concrete.

- 3.03 Mixing and Placing. The foundations shall be thoroughly moistened immediately prior to the placing of the concrete. Compaction of the concrete shall have thorough consolidation achieved by tamping, spading, vibrating or other acceptable methods. Forms shall be left in place until the concrete has set sufficiently to prevent deformation due to removal. Upon removal of the forms, the curb face shall be immediately finished to a uniform surface. In the case of matching existing concrete finishes, an approved method shall be used.

SECTION 02520 - CONCRETE PAVING, SIDEWALK, AND CURB AND GUTTER

- 3.04 Finishing. The surface shall be floated with a wood or magnesium float and given a broom finish. No plastering of the surface will be permitted. All outside edges of slabs and joints shall be rounded to a 3 inch radius. Broom marks to be perpendicular to traffic or pedestrian flow for installation of sidewalk or concrete flatwork. Broom marks to be parallel to traffic flow for installation of curb and gutter.
- 3.05 Joints. Expansion joints shall be formed around all appurtenances such as manholes, utility poles, adjacent structures, etc. extending into or abutting the work and between concrete sidewalks and any fixed structure. Asphalt expansion joint filler, 3" thick (W.R. Meadows Sealtight conforming to ASTM D-994 or equal) shall be installed in these joints.
- Construction joints shall be placed at the end of a day's run or during a day's work if there is more than a 30 minute delay in concrete delivery. Pre-molded tongue and groove joint filler, 3" thick (W.R. Meadows Sealtight conforming to ASTM D-994 or equal) to be installed wherever construction joints are required.
- Control joints shall be made by a forming tool to a depth of 1" with a width of 3". Control joints shall be struck at 10'- 0" o.c. for curb and gutter, and as shown on the drawings for sidewalks and other concrete flatwork.
- 3.06 Curing. Immediately upon completion of the finishing, concrete shall be moistened and kept moist for a minimum of 72 hours. In lieu of wetting, use of a membrane curing compound, at the direction of the Engineer, will be permitted.
- 3.07 Backfilling. After the concrete has set sufficiently, the areas behind the curb shall be backfilled to the required elevations and shall be thoroughly compacted in accordance with Section 02220 - Excavation, Backfilling, and Compaction.
- 4.00 FIELD QUALITY CONTROL
- 4.01 Tolerances. All vertical surfaces shall not vary more than 3" in 10' in the horizontal direction. Surface deviation shall not exceed 3" when measured with a 16' straight edge.
- 4.02 Concrete Strength. Testing shall be as per Section 03000 of this set of specifications.

End of Section

SECTION 02580 - PAVEMENT MARKING

1.00 GENERAL

- 1.01 Scope. This work shall consist of furnishing and applying pavement marking in accordance with these specifications, and in reasonable close conformity to the lines, dimensions, patterns, locations and details shown on the plans or as directed by the Owner's Representative.

1.02 Related Work Specified Elsewhere.

Section 01060 - Codes, Standards, Reports, Permits
 Section 01340 - Shop Drawings and Samples
 Section 02550 - Asphalt Paving and Reinforcing

- 1.03 Reference Standards. The latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," (M.U.T.C.D.), and the latest revision of the Colorado supplement thereto.

2.00 MATERIALS

- 2.01 Paint. Paint shall conform to the requirements of subsection 708.05 of the "Standard Specifications for Road and Bridge Construction", State Department of Highways, State of Colorado, latest edition, or approved equal.
- 2.02 Glass Beads. Glass beads for reflectorized paint shall conform to the requirements of subsections 713.08 and 713.09 of the Colorado Department of Highway Standard Specifications for Road and Bridge Construction, latest edition, or approved equal.

3.00 METHODS AND PROCEDURES

- 3.01 Execution. Pavement marking paint shall be applied according to the requirements of Section 627, Pavement Marking, of the Colorado Department of Highway Standard Specifications for Road and Bridge Construction, latest edition. Striping shall be done during daylight hours when air and pavement temperatures are at least 40°F. The pavement surface and weather conditions shall be conducive to satisfactory results.

Equipment shall be capable of painting a reasonable clean-edged stripe of the designated width (□□ in.), and shall have a bead dispenser directly behind, synchronized with the paint applicator. For centerlines and lane lines, an automatic skip control will be used that will paint a stripe with a gap as shown on the plans. Machines having multiple applicators shall be used for centerlines with "no passing zones." In areas where machines are not practical, suitable hand-operated equipment shall be used. Stripes shall be protected until dry.

- 3.02 Application rate. Application rate for 1 gallon of pavement marking paint at 4" width: 300' - 330' of marking (100 - 110 sq. ft.). Reflective glass beads shall be applied at the rate of 6 lbs. of beads per gallon of marking paint.

End of Section

SECTION 02810 - IRRIGATION SYSTEM**1.00 GENERAL**

1.01 Scope. This work consists of furnishing and constructing an irrigation system in accordance with these specifications and in conformity with the lines and details shown on the plans or as directed by the Engineer.

1.02 Related Work Specified Elsewhere.

Section 02221 - Trenching, Backfilling, and Compaction
 Section 03000 - Concrete
 Section 16000 - Electrical

1.03 Reference Standards.

Fort Lewis College Minimum Standards for Landscape Irrigation - 1994 edition
 National Electrical Code - latest edition

2.00 MATERIALS

2.01 General. All material used for the construction of the irrigation system shall be new and unused.

2.02 Pipe and Fittings.

- A. PVC pipe 6" diameter and greater shall be type 1120, SDR 21, class 200 with minimum 2000 psi design stress. PVC pipe 4" diameter and smaller shall be type 1120, schedule 40 with minimum 2000 psi design stress. All pipe shall be identified with the following indelible markings: manufacture's name, nominal pipe size, schedule or class of pipe, pressure rating in pounds per square inch, date of extrusion, and NSF seal of approval.
- B. Solvent weld fittings shall be schedule 40 PVC, or schedule 80 PVC, as shown on the detail drawings. PVC nipples shall be only schedule 80. Saddle clamp or taps are not permitted. Cement and cleaner for solvent weld pipe and fittings shall conform to ASTM D 2564.
- C. Gasketed fittings shall be class 200 PSI rated PVC, epoxy coated steel, cast iron, or A/C. Insertion of the pipe in the coupling shall be controlled by an internal PVC mechanical stop in the coupling which will allow for a thermal expansion and contraction. Coupling method shall allow for half of the expansion or contraction of each pipe section to be taken up at each end of the pipe. Couplings shall permit 5 degrees deflection (2.5 degrees on each side) of the pipe without any evidence of infiltration, exfiltration, cracking or breaking

2.03 Automatic Controllers. The automatic controller shall be an electro-mechanical or microprocessor based/microelectronic solid state type as specified on the drawings. The controller shall be capable of operating in an automatic or manual mode. The controller shall operate on a minimum of 117 volts AC power input. Controller electrical output shall be capable of 26.5 volts AC at 1.5 amps. The controller shall have a reset circuit breaker to protect it from power overload. The controller enclosure (including satellite controllers) shall be of a vandal and weather-resistant nature.

Provide shop drawing for automatic controller pedestal installation for approval of Owner prior to construction of pedestal.

2.04 Control Wiring. Control wire shall be a minimum of 14 gage single strand copper wire, direct burial, AWG, UF, UL, 300V. Install all 24 volt wire not occurring within the mainline trench at minimum 12" depth. Control wires shall be installed in minimum 1" 80 lbs. NSF polyethylene conduit pipe with schedule 40 PVC fittings. Use only all stainless steel screw clamps on poly pipe connections. Common wire shall be white. Control wires shall be other than white. Use a different color control wire for each station (if required). Wire splices shall be made with epoxy filled, heat shrink, or other U.L. approved waterproof splice kits. Provide slack in wire at each valve to permit valve cover, solenoid and wire splices to be lifted 18" for service.

2.05 Valves.

- A. Isolation Valves. Isolation valves shall be cast iron non-rising stem gate valves with nut for valve key rated at 200 psi differential pressure. Piping from the existing mainline to the isolation valve shall be as a minimum equal to the pipe being tapped, or schedule 40 PVC, whichever requirement is greater. Isolation valves shall be installed in 5 1/4" diameter cast iron valve box with lid, 'Tyler' or approved equal.
- B. Remote Control Valves. Remote control valves shall be contamination resistant cast brass or bronze as specified on the drawings. The control valve shall be a normally closed 24-volt AC, 60 cycle solenoid actuated globe or angle pattern, diaphragm type valve. The internal components (not including diaphragm and seat disc) shall be non-corrosive brass, bronze, stainless steel, or a combination thereof. Control valve diaphragms shall be of a one-piece molded reinforced fabric. Control valve shall have a non-shock cold water rating of at least 150 psi.

Control valves shall function manually (without electrical power) by means of an internal bleeder device on the bonnet assembly. Control valves shall have manual flow control capacity. Control valves shall be constructed so that the bonnet assembly and all operating parts can be removed without disturbing the valve body.

- C. Mainline Pressure Reducing Valve (if required). Valves two inches or smaller shall be of the diaphragm spring cage construction type with a bronze body, renewable stainless steel seat, and stainless steel integral strainer. Valves larger than two inches shall be the balanced piston type with a ductile-iron, or cast iron body.
- D. Manual Drain Valves (if required). The manual drain valves shall be constructed of heavy duty cast bronze and machined brass. The drain valve shall be a rising stem globe valve with a non-shock cold water rating of at least 150 psi. The drain valve shall have a reverse flow capability, removable bonnet, and cast bronze cross handle.

2.06 Sprinkler Heads. The sprinkler heads shall be of the pop-up spray and pop-up rotor internal drive type as specified on the drawings. All sprinkler heads shall be capable of accepting a check valve if required.

- A. Pop-up Sprays. The pop-up spray head, body, stem, and screen shall be constructed of heavy duty plastic. Spray heads shall have the following components: A soft pressure-activated wiper seal for cleaning debris from the pop-up stem as it retracts in the case to prevent stem and nozzle from sticking in the up position. A matched precipitation rate brass or plastic nozzle with an adjustable screw capable of regulating the radius and flow. A screen to protect it from clogging and a strong stainless steel retract spring for positive pop-down. A threaded cap that will allow easy removal of the screen and all other internal components from the top without removing the body from the ground.

Minimum pop-up height for turf heads shall be 4 inches. Spray heads pop-up height for shrub, flower, and groundcover areas shall be at least 12 inches.

- B. Rotor Heads. The pop-up rotor heads shall be an internal drive type, with heavy duty plastic housing and non-corrosive internal components. The rotor head shall have a soft pressure-activated wiper seal for cleaning debris from the pop-up stem as it retracts into the case, to prevent the stem and nozzle from sticking in the up position. The rotor head shall have a screen to protect it from clogging and strong stainless steel retracting spring for positive pop-down. Minimum pop-up height for rotor heads shall be 4 inches. The rotor head shall have a fully adjustable arc or full circle capabilities and an adjustable spray capable of reducing the radius up to 25%.

2.07 Plastic Valve Boxes. The valve box, cover and necessary extensions shall be as shown on the plans, and shall be manufactured or molded, virgin plastic materials conforming to ASTM D 638 and D 648. Box extensions shall be used as necessary to completely expose the remote control valve and shall seat in place under the valve box. Valve box lids shall be imprinted "Irrigation Control Valve."

3.00 METHODS AND PROCEDURES

3.01 General. Irrigation system shall be installed in conformity with applicable codes. Information on the plans shows general locations only. The Contractor shall establish exact locations for all irrigation equipment to fit field conditions, and locations will be approved by the Engineer prior to start of construction. Contractor shall maintain and protect the approved staking layout.

3.02 Site Review. Before any work commences, a conference shall be held with the Engineer and Contractor regarding general requirements of the work. The Contractor shall notify the Engineer prior to mainline pressure testing, coverage test and final review.

3.03 Excavation and Backfill. The Contractor shall maintain bottoms of trenches flat to permit all piping to be supported on an even grade. No rock larger than one inch shall be allowed in the backfill material. Where it is necessary to excavate adjacent to existing trees or shrubs, the Contractor shall use all possible care to avoid injury to the plant root system.

3.04 Pipe Installation.

A. The minimum depth of cover shall be as follows:

PRESSURE LINES		NON-PRESSURE LINES	
In Landscaping	Under Vehicular Paving	In Landscaping	Under Vehicular Paving
18"	18"	12"	18"

B. All pipe and wire conduit under asphalt or concrete paving shall be installed in minimum 6" diameter class 200 PVC sleeves - extend sleeves 18" past edge of pavement. Pipe sleeves shall be marked with an above ground marking system for future locations.

C. Where piping is to be installed in areas containing established turf, the sod shall be removed from the trench line in the necessary width and to a depth of at least 1". The backfill shall be brought to grade by tamping before replacing the sod. Only light tamping will be permitted on the sod. The trench area shall then be cleaned of all deleterious matter.

D. At least four inches of clearance shall be provided between lines and at least four feet of clearance between lines of other trades unless otherwise allowed. Parallel lines shall not be installed directly over any other line. Plastic threaded fittings shall be assembled using teflon tape applied to male pipe threads only. The Contractor shall tape all open ends of the pipe during installation to prevent entry of any foreign matter into the system.

E. The interior of the pipe shall be thoroughly cleaned for foreign matter before being lowered into the trench and shall be kept clean during laying operations by securely closing open ends of pipe or fittings. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells and joints. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water, or when trench or weather conditions are unsuitable for the work, except when otherwise expressly permitted by the Engineer. Water shall be kept out of the trench until the joints have been completely made up. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe without additional expense to the Owner. Where pipe ends are left for future connections they shall be valved, plugged, or capped, as directed.

F. Concrete thrust blocks shall be machined mixed and shall be installed at locations as shown on the drawings. Care shall be taken not to obstruct the outlets of tees which are intended for future connections, and a water proof paper or plastic bond-breaker shall be placed between the fittings and the

concrete thrust block to facilitate removal of the concrete in the future. Thrust blocks shall be poured against undisturbed earth and to at least the minimum dimensions shown in the details on the drawings. The thrust blocks shall be approved by the Owner's Representative prior to backfilling.

- 3.05 Automatic Controller Installation. Controller shall be installed in conformance with previously approved shop drawing. Power source wire shall be installed in conduit in a trench at a minimum depth of two feet and shall be #12 wire or larger. Install warning tape for power wiring underneath irrigation piping and wiring. Install 110 volt wiring to National Electrical Code (N.E.C.) requirements. Grounding of irrigation controller shall be as per manufacturer's recommendations and as per N.E.C. Primary power and lighting surge protection for 110 volt lines shall be installed to protect the controller. Secure the controller and all exposed conduit so as to reduce damage from vandalism.

All valve wires shall be identified with a permanently marked valve number corresponding to the valve numbering system as indicated on the plans. The numbers on the valve wires shall be clearly visible within the automatic controller pedestal.

- 3.06 Installation of Wiring. All 24-volt wire to automatic control valves shall be installed at a minimum depth of 12 inches below finish grade. Wiring shall be installed at the side of mainline whenever possible. When more than one wire is placed in a trench, the Contractor shall tape wires together with electrical tape at intervals of 20 feet or less. A 24 inch coiled expansion loop shall be provided every 100 feet along wire run, before controller enclosures, at each connection, and at directional changes. Provide slack in wire at each valve to permit valve cover, solenoid, and wire splice to be lifted 18" for service. Each controller shall have its own separate ground wire, colored white. Wiring between controller and valves or sensors shall be continuous. At locations where splicing is approved by the Engineer, moisture proof splice shall be made in a valve box. Two extra wires shall be installed along the entire mainline from each controller. Wire splices shall be compatible to wire coating. All wire under roadways shall be encased in a separate steel or plastic conduit within the PVC sleeves.

- 3.07 Valve Installation. Valve boxes shall not be located in play fields unless special consideration is made for safety. Valve boxes shall not be installed within 12" of paving or structures. Remote control valves shall be installed in a minimum 10" diameter manufactured plastic or concrete irrigation control valve box with locking lid. All field located specialty valves shall be installed within a minimum 10" diameter valve access box or minimum 5-1/4" diameter pipe sleeve with cap as specified of adequate size to permit easy access for servicing and adjustment.

All valve boxes shall be installed flush with the finished grade. No more than two valves per standard valve box will be allowed. Valve numbering system shall be as indicated on the plans. Geotextile filter fabric shall be placed under valve box and extend a minimum of three inches beyond bottom rim of valve.

Manual drain valves, if required, shall be installed at all low points of the main line pipe. The outlet of each MDV shall be piped to a gravel sump located immediately below the drain valve. Protect the entire top of the gravel sump with soil filter fabric.

- 3.08 Sprinkler Head Installation. Sprinklers must be a minimum of 2" and a maximum 4" from all paved areas, and a minimum 6" from any building. No sprinkler head shall be installed directly to rigid pipe. A method for achieving flexibility between the sprinkler head and the pipe is required using flexible nipples, swing joint assemblies, or multiple threaded ells as shown on the drawings. Rotor sprinklers used in play areas shall have suitable protective covers (lids) when required. Where sprinkler heads are installed prior to seeding or sodding of the area, the sprinkler heads shall be installed with the sprinkler top a minimum of 2" above finish grade. After the turf has been mowed twice, the irrigation Contractor shall lower all heads to grade.

- 3.09 System Flushing. After all irrigation pipelines and valves are in place and connected, and prior to installation of irrigation heads, the Contractor shall thoroughly flush all lines with water at system operating pressure.

- 3.10 Pressure and Coverage Tests, and Adjustment. After installation of valves, pipe, and fittings, mainlines shall be inspected for leaks after a minimum 90 psi static pressure has been maintained for four hours in a hydrostatic test. The Contractor shall perform coverage tests after the irrigation system is completed and prior to any planting, seeding, or sodding, in the presence of the Engineer, to assure that all irrigated areas are watered completely and uniformly, and shall make all necessary adjustments to provide required coverage as directed by the Engineer.

- 3.11 Clean Up. Upon completion of the work, the Contractor shall restore ground surfaces to required elevations and remove excess material, debris, and equipment from site.
- 3.12 Record Drawings.
- A. The contractor shall maintain a clean set of drawings for the exclusive purpose of recording changes from the originally approved design.
 - B. The changes shall be kept current and available at the site for review by the Owner's Representative.
 - C. The Contractor shall deliver to the College a reproducible "as-built" set of drawings for the irrigation system upon completion of the installation of the system.
- 3.13 Controller Schedule. The Contractor shall deliver to the College a preliminary weekly schedule for the automatic controller. All turf irrigation shall be scheduled between 8:00 P.M. and 7:00 A.M.
- 3.14 Keys and Manuals. Upon the completion of the work, the Contractor shall deliver to the Owner all instruction manuals for the irrigation system, including the automatic controller. The Contractor shall also provide a minimum of 2 keys for the controller, and a minimum of 2 keys needed for manual operation of valves. Valve keys shall be of adequate length and made of non-corrosive metal.
- 3.15 Final Acceptance. Upon completion of the work, at a time to be designated by the Owner, the Contractor shall demonstrate to the Owner the operation of the entire irrigation system.
- 3.16 Guarantee.
- A. The Contractor shall guarantee the system to perform satisfactory for a minimum of one year from the date of acceptance by the Owner.
 - B. During the guarantee period, the Contractor shall correct all problems which develop in the system due to faulty materials or workmanship.
 - C. It is very important that all replacement items be of identical performance and of at least the same quality as those items being replaced. Thoroughly test all replacement items for proper operation.
 - D. In the spring following the year of installation, the Contractor shall repair any settlement of the trenches by bringing them to grade with top soil and seeding. Watering and maintenance of the repaired areas shall be the Owner's responsibility.

End of Section

SECTION 02920 - TOPSOILING**1.00 GENERAL**

- 1.01 Scope. This work shall consist of excavating suitable topsoil from stockpiles, approved pits, or from stripping the natural ground cover on designated areas of construction disturbance that will be occupied by buildings and sitework. It shall include the placing of topsoil after construction and grading operations are completed. All work shall be in accordance with these specifications and in reasonably close conformity with the lines and thicknesses shown on the plans or as directed.

1.02 Related Work Specified Elsewhere.

Section 02020 - Construction Staking
 Section 02220 - Excavation, Backfilling and Compaction
 Section 02221 - Trenching, Backfilling and Compaction

2.00 MATERIALS

Topsoil. The source of Topsoil material shall be the existing stockpiled material adjacent to the project site. Topsoil shall consist of loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, hard clods, toxic substances, construction debris or other material which would be detrimental to the proper development of vegetative growth. The Owner reserves the right to reject any topsoil deemed unsuitable upon the sole discretion of the Owner's Representative.

3.00 METHODS AND PROCEDURES

- 3.01 Topsoiling. Materials selected for topsoil and lying within the clearing limits shall be excavated and stockpiled at designated locations. Minimum excavation depth for topsoil to be 6 inches. All excess suitable topsoil shall remain the property of the Owner, and shall be stockpiled at a site on campus as designated by the Owner's Representative. All unsuitable topsoil as determined by the Owner's Representative shall be removed and legally disposed of off-campus at the expense of the Contractor.

Topsoil shall not be placed until the areas to be covered have been properly prepared and grading operations and all other construction activity in the area have been completed. Topsoil shall be placed and spread in all areas of construction disturbance at a minimum depth of 4 inches. Topsoil shall be keyed to the underlying material by the use of harrows, rollers, or other equipment suitable for the purpose. Variations shall not be more than 0.08 ft. Remove all debris subject to termite attack, rot or corrosion, and all other deleterious materials from areas to be filled. All loose exposed rock larger than one-half inch in turf areas and three inches in dryland areas shall be removed.

- 3.02 Fine Grading. Fine grading by hand or other means as approved by the Owner shall be required after topsoil placement to provide a reasonably smooth surface free from irregularities and visual undulations. The finished grade shall be brought to elevations indicated and sloped to drain water away from structures and provide positive drainage for surface water runoff. Finished surfaces shall be smooth and even and satisfactory to the Owner. After fine grading the surface shall not vary more than 0.04 ft. in 10 ft. from the proposed profile and cross section, or more than 0.04 from the proposed elevation. Surface debris from fine grading operations shall be removed from site and disposed of legally at the Contractor's expense.

End of Section

DIVISION 3**CONCRETE****SECTION 03000 - CONCRETE****1.00 GENERAL**

The General Conditions, Supplementary General Conditions and Division 1 - General Requirements, are a part of this division insofar as they are applicable to the work specified herein.

- 1.01 Scope of Work. The work to be done under this contract includes all labor, materials and services necessary for, and reasonably incidental to, the completion of all concrete work, both plain and reinforced, as shown on the Drawings or Specified.
- 1.02 Related Work Specified Elsewhere.
- 02520 – Concrete Curb, Gutter, and Sidewalk
 - 03000 - Concrete
 - 03100 - Concrete Formwork
 - 03200 - Concrete Reinforcement
 - 03300 - Cast-in-Place Concrete
- 1.03 Reference Standards. ACI Standard 301-89 The American Concrete Institute (ACI) Standard 301, "Specifications for Structural Concrete for Buildings" are hereby made a part of these Specifications to the same extent as if they were written herein, except that they may be amended or superseded by these Specifications or the Drawings. The General Notes on the Drawings shall be read in conjunction with the ACI Standard Specifications.
- 1.04 Inspection of Site. The Contractor shall personally inspect the site of the proposed work in order to become familiar with all the conditions under which the work is to be done.
- 1.05 Supervision. The Contractor shall have in charge of the work at all times during the construction a thoroughly competent superintendent, one with extensive experience in the form of construction employed.
- 1.06 Submittals. Mix designs, shop drawings and catalog information shall be submitted for related equipment and components, in order to show that concrete and items selected and to be installed by the Contractor generally conform with the Contract Documents. Submittal information includes, but is not necessarily limited to the following:
- A. Miscellaneous product information. Catalog information and shop drawings for: water stops, admixtures, bonding agents, membrane curing compound, joint sealer, embedded items, non-shrink grout, and other concrete appurtenances.
 - B. Proposed concrete mix design. The Contractor shall be responsible for fully informing the concrete supplier of all specification requirements regarding the concrete mix before the proposed mix design is submitted. The Contractor shall pay for the cost of the concrete mix design.
 - 1. The proportions of ingredients shall selected to produce the proper slump, air content, strength, maximum water-cement ratio and other required properties as specified. The proportion of ingredients shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement by the methods of placing and consolidation employed on the work, but without permitting the materials to segregate or excessive free water to collect on the surface.
 - 2. Prior to commencing concrete work, submit and obtain Engineer's review of certified test reports describing proposed concrete mix design, which shall be prepared in compliance with ACI Standard 301, with concrete proportions established on the basis of previous field experience or laboratory trial batches, except as modified herein. Test reports shall also include:

- a) Fine aggregates - Source, type, graduation, deleterious substance and bulk specific gravity on basis of weight of saturated surface - dry aggregate. ASTM C128.
 - b) Coarse aggregate - Source, type, graduation, deleterious substances and bulk specific gravity on basis of weight of saturated - dry aggregate. ASTM C127.
 - c) Ratio of fine to total aggregates.
 - d) Weight (saturated, surface dry) of each aggregate per cubic yard.
 - e) Total water content in gallons per cubic yard.
 - f) Slump on which design is based (shall be within 1" of maximum slump permissible for each mix design).
 - g) Brand, type and quantity of cement.
 - h) Brand, type and quantity of admixtures.
 - i) Water-cement ratio (shall be less than that specified in ACI 301-Section 2.3).
 - j) Air content (shall be within 1% of maximum air content permissible).
3. For the laboratory trial batches method, the determination of the cement content necessary to attain the required strength and other properties, without exceeding the maximum water-cement ratio, shall be by preliminary tests in accordance with the following procedures:
- a) Concrete trial mixtures having proportions and consistency suitable for the work shall be made using at least three different cement contents which will produce a range in strengths encompassing those required for the work. Trial mixes shall be designed to produce the maximum allowable slump and the maximum allowable air content.
 - b) Proportions of ingredients shall be determined and tests conducted in accordance with the basic relationships and procedures outlined in "Recommended Practice for Selecting Proportions for Normal and Heavy-Weight Concrete (Part I)" (ACI 211.1).
 - c) For each cement content, at least three specimens for each age to be tested shall be made and cured in accordance with "Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory" (ASTM C192) and tested for strength at 7, 14, and 28-days. Test shall be conducted in accordance with "Method of Test of Compressive Strength of Molded Concrete Cylinders" (ASTM C39).
 - d) From the results of these tests, a curve shall be plotted showing the relationship between cement content and the average 28-day compressive strength. The minimum cement content to be used shall be that value shown by the curve to produce a strength at least 1200 psi greater than the 28-day strength specified. In any case, the minimum cement content shall not be less than that specified. If the previous field experience method is used in proportioning, the strengths shall be in compliance with ACI 301. In addition, the Contractor shall demonstrate the ability of the proposed mixture proportions to produce concrete meeting all requirements of these specifications.
4. In addition to the test data described above, when it is expected that concrete will be placed under hot weather concrete conditions as defined in ACI-305, trial batches shall be tested at the maximum temperature that the concrete is expected to be placed at, or sufficient records submitted which show field concrete performance under these temperatures and which are acceptable to Engineer.

2.00 MATERIALS

2.01 Concrete Material.

- A. Cement shall conform to the "Standards Specification for Portland Cement", ASTM C150, Type II Cement. Once cement type is chosen, the type and source shall remain the same throughout the project.
- B. Fly ash, where used, shall be Class C or F, ASTM C618. No more than 15% of the total cementitious content by weight shall be fly ash.
- C. Aggregates.

1. Fine aggregate - conform to ASTM C33.
 2. Coarse aggregate - conform to ASTM C33 except that air-cooled blast furnace slag will not be allowed. Use coarse aggregate in accordance with ASTM No. 67 (3/4") unless otherwise specified or acceptable to Engineer. Nominal maximum size of coarse aggregate shall not be larger than 3/4".
 3. Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate as well as the combination of sizes when two or more are used shall conform to the grading requirements of the appropriate ASTM specifications.
 4. Once aggregates are chosen, the same source and type of aggregates shall be used throughout the project.
- D. Water. Shall be clean, fresh, and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.
- E. Admixtures.
1. Use only as specified or reviewed and acceptable to Engineer.
 2. Include any admixtures to be used in the proposed concrete mix designs.
 3. Do not use admixtures which cause accelerated setting of cement.
 4. Calcium chloride is not permitted.
 5. Air-Entraining Agent - conform to ASTM C260. Use Procreate AES air-entraining admixture or equivalent acceptable to Engineer.
 6. Water-Reducing and Retarding - conform to ASTM C494. Use only as specified or with Engineer's prior review and acceptance. Water-reducing admixture shall be added at the plant and shall be Pozzolith 322N by Master Builders or equivalent acceptable to Engineer. High range water-reducing admixtures (super plasticizer) shall not be used except by special testing and review by the Engineer.
 7. Two or more admixtures may be used in the same concrete, provide such admixtures are added separately during the batching sequence and provided that the admixtures used in that combination retain full efficiency and have no deleterious effect on the concrete or on the properties of each other.
- F. Colored/tinted concrete (if specified): Concrete shall contain integral pure color concentrate as manufactured by Davis Color, Los Angeles, CA., at the rate of 3 pounds of color per sack of cement. See plans for specification of colors.

3.00 METHODS AND PROCEDURES

3.01 Testing.

- A. Testing Laboratory: Owner will retain the services of an independent testing laboratory to take samples, make tests and submit reports of tests to the Engineer.
- B. Extent of Tests: For each mix design take samples and make tests for 50 cubic yards of fresh concrete or fractional amount placed in the project, but not less than one set for each day's concreting or as directed by the Engineer. Additional tests requested by the Contractor shall be paid for by the Contractor.
- C. Compression and Strength Test: Each test shall consist of four standard 6" by 12" cylinders; one cylinder to be tested at the age of 7 days and two cylinders at the age of 28 days. Samples from which compression test specimens are molded shall be secured in accordance with ASTM C-172. Specimens made to check the adequacy of the design for strength of concrete, or as a basis for acceptance of concrete shall be made laboratory cured in accordance with ASTM C-31. Additional test of specimens cured entirely under field conditions may be utilized to check the adequacy of curing and protection of the concrete as directed. Strength tests shall be made in accordance with ASTM C-39.

3.02 Acceptance of Concrete Strength.

- A. If the 7-day strength test falls below the specified 7-day strength, the Engineer shall have the right to require conditions of temperature and moisture necessary to secure the required strength.
- B. Strength level of concrete will be considered satisfactory so long as the average of the two 28-day strength test results equals or exceeds specified 28-day strength and no individual strength test result falls below specified strength by more than 500 psi.

3.03 Enforcement of Strength Requirements.

- A. Upon failure of the 28-day test cylinder results, Engineer may require Contractor at his expense, to obtain and test at least three pullout tests or core samples from area in question.
- B. Concrete will be considered adequate if average of three pullout or core tests is at least 85% of, and if no single core is less than 75% of the specified 28-day strength.
- C. Upon failure of the pullout or core test results, Engineer may require Contractor, as his expense, to remove and replace defective concrete as directed by Engineer.
- D. Fill all pullout or core holes as specified for repairing defective concrete.

End of Section

SECTION 03100 - CONCRETE FORMWORK**1.00 GENERAL**

This work shall consist of furnishing and erecting the necessary formwork and bracing for all cast in place concrete associated with the site work, as shown on the drawings. Formwork surfaces that will provide the finish surface of exposed concrete must be inspected and approved prior to concrete placement. Design and construct formwork in conformance to A.C.I. 347 - Guide to Formwork for Concrete.

2.00 MATERIALS**2.01 Forms.** Forms shall be plywood, dressed lumber, or metal.

Form lumber for all exposed concrete surfaces shall be dressed at least on one side and two edges and shall be constructed so as to produce mortar-tight joints and smooth, even concrete surfaces. Forms shall be filleted and chamfered and shall be given a bevel or draft in the case of all projections, such as girders and copings, to assure easy removal.

Metal forms shall be of such thickness that the forms will remain true to shape. All bolt and rivet heads shall be countersunk. Clamps, pins, and other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms which do not present a smooth surface or do not line up properly shall not be used. Metal forms shall be free from rust, grease or other foreign matter.

2.02 Form Coating. Form coating shall be Symons Magic Kote, as manufactured by the Symons Manufacturing Company, Des Plaines, Illinois, or non-staining approved equal.**3.00 METHODS AND PROCEDURES****3.01 Design.** Forms shall be mortar tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other loads incidental to the concrete operations, including vibration. The rate of depositing concrete in forms shall be controlled to prevent deflections of the form panels in excess of the deflections permitted by these specifications.

Forms for exposed concrete surfaces shall be designed and constructed so that the formed surface of the concrete does not undulate excessively in any direction between studs, joists, form stiffeners, form fasteners, or wales. Undulations exceeding 3/32" between the center to center distance of studs, joists, form stiffeners, form fasteners or wales will be considered to be excessive. Should any form or forming system, even though previously approved for use, produce a concrete surface with excessive undulations, its use shall be discontinued until modifications satisfactory to the Engineer have been made. Portions of concrete structures with surface undulations in excess of limits herein may be rejected by the Engineer.

3.02 Construction. Forms shall be constructed and maintained so as to prevent the opening of joints due to shrinkage of the lumber. The use of ties consisting of twisted wire loops to hold forms in position will not be permitted. Concrete shall not be deposited in the forms until all work connected with constructing the forms has been completed, all materials required to be embedded in the concrete have been placed for the unit to be poured, unless otherwise specified on the plans or approved; and the Engineer has inspected said forms and materials. Such work shall include the removal of all dirt, chips, sawdust, water and other foreign material from the forms.**3.03 Slabs on Grade.** Where concrete slabs are deposited on earth, take care to obtain a smooth surface so slabs will be of uniform thickness as required throughout. Location of construction joints and control joints shall be as indicated on the drawings. Place joint forms in a straight line flush with finished surface and in accordance with the manufacture's direction. Wire bottom alignment slots and bottom of key to metal support stakes. Do not extend reinforcement through joint form unless so noted on the drawings.

Sawed joints may be substituted for joint forms at control joints. Sawed joints shall be one-fourth of the slab thickness in depth. Joint sawing shall be timed properly with the setting of the concrete. Cutting shall be started as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw, and shall be completed before shrinkage stresses have developed sufficiently to induce cracking.

- 3.04 Retaining Walls. The use of earth as a form will not be allowed. Lap forming with dressed lumber or plywood will not be allowed. Forms shall conform to shape, lines and dimensions of the members indicated on the drawings and shall be substantial and sufficiently tight to prevent leakage of mortar. Properly brace or tie to maintain position, shape and lateral stability, and provide sufficient strength to carry construction operations and material dead loads without deflection or vibration. Design forms to be capable of needed adjustments and carefully watch as work proceeds with faults promptly corrected. Where finished concrete is to remain exposed, joints shall be regularly spaced and held to a minimum both horizontally and vertically. Provide access panels in formwork for clean out or placing as required.
- 3.05 Form Coating. Coat the surface of formwork prior to each pour. Apply in strict accordance with manufacturer's directions. Apply coating prior to the placing of the reinforcement. Promptly remove any excess coating material. Remove coatings of dust from contact surfaces of forms prior to depositing concrete.
- 3.06 Removal. Remove forms only in such a manner as to insure the complete safety of the structure. Forms in general may be removed from horizontal surfaces 72 hours from time of placing unless otherwise specified.
- 3.07 Reuse of forms. Clean form material suitable for reuse before erection. No form material will be acceptable for reuse if, in the opinion of the Engineer, it will not produce a finished surface required by these specifications or called for on the drawings.

End of Section

SECTION 03200 - CONCRETE REINFORCEMENT**1.00 GENERAL**

- 1.01 This work shall consist of furnishing and placing reinforcing steel and/or synthetic fiber reinforcing for all cast-in-place concrete associated with the sitework as shown on the drawings. Reinforcement placement must be inspected and approved prior to concrete placement.
- 1.02 A list of all reinforcing steel and bending diagrams shall be furnished to the Engineer at the site of the work at least one week before the placing of reinforcing steel is begun. Such lists will not be reviewed for accuracy. The Contractor shall be responsible for the accuracy of the lists and for furnishing and placing all reinforcing steel in accordance with the details shown on the plans. The Contractor shall verify the quantity, size, and shape of the bar reinforcement against those shown on the plans and make any necessary corrections before ordering.
- 1.03 Submit shop drawings for all reinforcing steel indicating the size, configuration, pertinent dimensions, number, exact position and spacing of reinforcement and the exact location of all openings, framing or special conditions affecting the work.

2.00 MATERIALS

- 2.01 Reinforcing Bars. Reinforcing bars shall meet the requirements of ASTM A-615 for new deformed billet steel bars, grade 60, unless noted otherwise. They shall conform to the general notes on the drawings. Welding reinforcing bars is not permitted except where specifically indicated. Where required, protect exposed bars intended for bonding with future construction from corrosion by adequate covering.
- 2.02 Bar Supports. Bar supports or spacers shall be the Contractor's option as approved by the Owner's Representative.
- 2.03 Tie Wire. Tie wire shall be a No. 14 or no. 16 gauge black soft iron wire.

3.00 METHODS AND PROCEDURES

- 3.01 Inspection. Reinforcement. Completed installation of concrete reinforcement must be inspected and approved by the Engineer before placing concrete.
- 3.02 Placement.
 - A. General: Comply with General notes on the drawings.
 - B. Bending: Bend reinforcement cold. Bars shall be full length required and accurately bent to details. No bars partially embedded in concrete shall be field bent except as indicated on the drawings or specifically permitted by the Engineer.
 - C. Placing: Place reinforcement accurately and hold firmly in place before and during the placing concrete. Provide minimum concrete protective cover for reinforcement from the exterior face of members in accordance with ACI 318 and notes on drawings. Provide bar supports and spacers to place bars in the proper location and wire adequately at intersections to hold bars firmly in position while concrete is placed. Project dowels 36 diameters unless otherwise indicated. Wire bent dowels in place before placing concrete.
 - D. Splicing: Wherever it is necessary to splice reinforcement other than as indicated on the drawings, the character of the splice shall be approved by the Engineer on the basis of allowable bond stress and the stress in the reinforcement at the splice. Splicing shall not be made at points of maximum stress nor shall adjacent bars be spliced at the same point. Lap continuous bars 36 diameters.
 - E. Supports and Spacers: Types of supports and spacers are optional with the installer. Supports shall be properly spaced and shall have sufficient strength to carry the loads of reinforcing steel and deposited concrete without collapsing or allowing bars to sag. Brickbats or precast blocks may be used to support mats of bars with the approval of the Engineer. Bar supports and spacers which will be in contact with

SECTION 03200 - CONCRETE REINFORCEMENT

concrete surfaces exposed to weather shall be galvanized. Do not use bar supports to support runways for concrete buggies or similar loads.

- 3.03 Cleaning. Clean reinforcement prior to placing concrete to remove scale, oil, ice or other coating that will destroy or reduce the bond, including mortar from previous concrete pours.

End of Section

SECTION 03300 - CAST-IN-PLACE CONCRETE**1.00 GENERAL**

1.01 Scope of Work. This work shall consist of furnishing and placing natural or tinted portland cement concrete associated with the sitework as shown on the drawings. This section includes, but is not necessarily limited to, concrete sidewalks, paving, retaining walls, curbs and gutters.

1.02 Related Work Specified Elsewhere

01410 - Testing
 02230 - Embedment and Base course Aggregate
 03000 - Concrete
 03100 - Concrete Formwork
 03200 - Concrete Reinforcement

1.03 Reference Standards. Cost of concrete mix designs to be borne by Contractor. The supplier of the concrete shall submit mix designs per ACI 301 Section 3.9 for review by the Architect/Engineer. A statement shall accompany the proposed mix design certifying that the specified strength as well as the slump and air content will be met. Review and acceptance of the mix design by the Architect/Engineer in no way relieves the supplier of the responsibility for performance of the concrete.

1.04 Notice of Work. Directly inform Engineer at least 24 hours in advance of time and places at which Contractor intends to place concrete. All preparation work for concrete placements shall be substantially completed at least 4 work-day hours prior to the scheduled start of concrete placement to allow for the Engineer's review and any necessary corrections.

1.05 Coordination. The Contractor shall oversee all building trades and Subcontractors so as to insure proper coordination of concrete work with base preparation, utilities, embedded items, etc.

1.06 Ready-mix delivery tickets. Submit delivery tickets for each load at time of delivery indicating the following:

- A. Quantity delivered.
- B. Mix Identification Number
- C. Quantity of each material in batch, including all admixtures.
- D. Outdoor temperature in shade.
- E. Time at which water was added.
- F. Elapsed time between when water was added and concrete load was in place.
- G. Amounts of initial and supplemental water added, including any correction for water in aggregates.
 *Note: Total water amount shall result in a water/cement ratio less than the maximum permissible.
- H. Name of individual authorizing supplemental water.

1.07 Testing. Refer to Section 01410 - Testing, for concrete test cylinder requirements. The Contractor shall keep a concrete slump testing cone on the job at all times and shall perform an unofficial slump test according to the procedure outlined in the American Concrete Institute Standard 301-89, Chapter 16 if required. Submit copies of certified test cylinder compression test reports to Engineer.

For cold or hot weather concreting conditions, lab cured cylinder tests may not be an accurate indication of field achieved strengths. Under these weather conditions, the Engineer may require pullout tests in accordance with ASTM C900 Lok-test (CTL/Thompson, Inc.), or equivalent, or job cured cylinder breaks to determine field strength (cylinders to be job cured in same manner as the in-place concrete.) Testing shall be paid for by the Owner. If cold or hot weather concreting practices as specified in ACI-305 & 306 are not adhered to, the Engineer may require Contractor, at Contractor's expense, to provide additional pullout tests in accordance with ASTM C900, Lok-Test (CTL/Thompson, Inc.), or equivalent, or job cured cylinder tests or 2" diameter cored samples from areas in question to determine field strengths achieved.

1.08 Tolerances.

SECTION 03300 - CAST-IN-PLACE CONCRETE

- A. Variations due to high of low spots shall not exceed 1/4" in 10'.
- B. Variations from the elevations indicate on the drawings shall not exceed 0.05'.
- C. Variations in thickness of slabs and walls shall not be less than 1/4" nor more than 1/2".
- D. All joints shall be straight and true to within 1/4" in 10'.

2.00 MATERIALS

2.01 Strength.

The Following Concrete Mixes Will Be Required:

- A. All Work - 4000 psi unless specified otherwise.
- B. Thrust blocks for irrigation system - 3000 psi
- C. Concrete for pipe embedment - 2000 psi

2.02 Durability. Concrete in the following areas shall be proportioned to resist destructive exposure: exterior paving, loading docks, site development structures and retaining walls

2.03 Cement. Only one brand and type of cement will be used throughout this project. Type II portland cement is to be used, produced by the same manufacturer.

2.04 Aggregates. Each type of aggregate shall be continuously obtained from the same source throughout the project.

2.05 Admixtures. Add air entraining agent to all concrete to entrain air as specified. Pozzoloth or equivalent water reducing admixture may be acceptable to reduce cement content subject to review of mix design by Architect/Engineer.

2.06 Integral Color for Colored/Tinted Concrete.

- A. Colored concrete shall contain integral pure color concentrate as manufactured by Davis Color, Los Angeles, CA., at the rate of 3 lbs. of color per sack of cement. See plans for specification of colors.
- B. Test Panels
 - 1. A minimum 6' x 6' test panel shall be prepared on site as directed by Owner's Representative. The panel shall have a swept broom finish with a 2" wide troweled picture frame around edge.
 - 2. Architect/Engineer in conjunction with Owner's Representative shall inspect panel and approve color and finish selection. If test panel is not acceptable in some respect, prepare another test panel is not acceptable in some respect, prepare another test panel at Contractor's expense with specific modifications as directed by Architect/Engineer. Any subsequent test panels desired shall be paid for by Owner.

2.07 Curing Compounds.

- A. Curing compounds shall conform to ASTM C390 - Specifications for Liquid Membrane Forming Compounds for Curing Concrete. Compound shall be Masterseal by Master Builders Co., Protex Triple Seal CCL-18, or approved equal. Follow all manufacturer's instructions.
- B. Curing compound for colored/tinted concrete shall be Davis W-1000 Clear Concrete Cure and Sealer. Apply 2 coats with a powered airless sprayer in strict conformance with the manufacturer's instructions.

3.00 METHODS AND PROCEDURES

3.01 Environmental requirements.

- A. Do not place concrete during rain, sleet, or snow unless adequate protection is provided and proposed placement is acceptable to Engineer.

- B. Do not allow rain-water to increase mixing water or damage surface finish.
- C. Changes in temperature of the concrete shall be as uniform as possible and shall not exceed 5 degrees Fahrenheit in any 1 hour or 50 degrees Fahrenheit in any 24 hour period.

3.02 Ready-mixed Concrete.

- A. All concrete used shall be ready-mixed, except as allowed with prior written approval of the Engineer. Ready-mixed concrete shall be batched, mixed and transported in accordance with "Specifications for Ready-Mixed Concrete" (ASTM C94).
- B. Ready-mixed concrete shall be furnished to the concrete contractor at the construction site and the Contractor shall furnish and provide all equipment necessary to receive and install the ready-mixed concrete as soon as it is received at the site. A mix certificate shall be furnished to Contractor by the ready-mix driver for each load of ready-mix concrete delivered to the job. See ready-mix delivery ticket section for details. All materials and the proportioning of same shall conform in every respect to those special herein.
- C. Time Constraints. Time constraints for discharge of concrete shall be in accordance with ASTM C94. Discharge of the concrete shall be completed within 1.5 hours, or before the drum has revolved 300-revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. These limitations may be waived if the concrete is of such slump after 1.5 hours time or 300-revolution limit has been reached that it can be placed, without the addition of water, to the batch and comply with all specification requirements. In hot weather, or under conditions contributing to quick stiffening of the concrete, a time less than 1.5 hours may be required.
- D. Retempering. Indiscriminate addition of water to increase slump shall be prohibited. Concrete shall be mixed only in quantities required for immediate use. Concrete which has partial set shall not be retempered, but shall be discarded.

When concrete arrives at the project with slump below that suitable for placing, first the concrete shall be remixed for at least one minute at mixing speed, if the slump is still too low, water may be added only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded. The water must be incorporated by additional mixing equal to at least half of the total mixing required. Such addition must be reviewed by the Engineer.

- 3.03 Colored/tinted Concrete. Follow all manufacturers' instructions for subgrade preparation, mixing, admixtures, placing, finishing, and curing, as well as these specifications. Coloring shall be mixed so as to produce concrete matching the test panel section approved by Architect/Engineer and Owner's Representative.

3.04 Joints

- A. Expansion joints. Expansion joints shall be formed around all appurtenances such as manholes, utility poles, adjacent structures, etc. extending into or abutting the work. Fiber expansion joint filler 1/4" thick (W.R. Meadows 'Sealtight' conforming to ASTM D-994 or equal) shall be installed in these joints and sealed with a suitable sealer. Expansion joint filler shall be installed between concrete sidewalks and any fixed structure.
- B. Control joints. Control joints shall be made by a forming tool to a depth and width as shown on the drawings. Control joints shall be struck at 10' o.c. for curb and gutter, and as shown on the drawings for sidewalks and other concrete flatwork.
- C. Construction joints. Construction joints shall be placed at the end of a day's run or during a day's work if there is more than a 30 minute delay in concrete delivery. Locate construction joints at control joints where possible. If not possible, use pre-molded tongue and groove joint filler 1/4" thick (W.R. Meadows 'Sealtight' or equal).

- 3.05 Cold Weather Concreting. Conform to ACI-306, "Cold Weather Concreting", in addition to this specification, for concrete delivery, curing and protection.

A. Temperature of concrete when placed shall not be less than following:

Air Temp (Fahrenheit)	Minimum Concrete Temp. (Fahrenheit)
30 - 45	60
0 - 30	70
below 0	Not Permitted

If water or aggregates has been heated, the water and aggregate shall be combined in the mixer before cement is added. Cement shall not be added to mixture of water and aggregate when the temperature of the mixture is greater than 100 degrees Fahrenheit.

- B. When placed, heated concrete shall not be warmer than 80 degrees Fahrenheit.
- C. Prior to placing concrete, all ice, snow, surface and subsurface frost shall be removed, and temperature of surfaces to be in contact with new concrete shall be raised to temperature specified for placing.
- D. Protect concrete from freezing during entire curing period.
- E. When the mean daily temperature of the atmosphere is less than 40 degrees Fahrenheit, forms shall be left in place a minimum of 5 days to aid in retaining heat.
- F. Heated enclosures shall be strong and wind proof to insure adequate protection of corners, edges, and thin sections.
- G. Do not permit heating units to locally heat or dry concrete.
- H. When the mean daily temperature of the atmosphere is less than 40 degrees Fahrenheit, the temperature of the concrete shall be maintained at or above 70 degrees Fahrenheit for a curing protection period of 3 days; or at or above 50 degrees Fahrenheit for a curing protection period of 7 days. When necessary, arrangements for temperature monitoring, heating, covering, insulating or housing shall be made in advance of placement and shall be adequate to maintain the required temperature and moisture conditions without injury due to concentration of heat.
- I. Do not use combustion heaters during first 24 hours unless concrete is protected from exposure to exhaust gases which contain carbon dioxide.

- 3.06 Hot Weather Concreting. Conform to ACI 305, "Hot Weather Concreting" in addition to this specification.

- A. Take precautions when ambient air temperature is 90 degrees Fahrenheit or above. These measures may include installation of wind breaks, shading, fog spraying, sprinkling, ponding, or wet covering of a light color.
- B. Temperature of concrete when placed shall not exceed 85 degrees Fahrenheit.
- C. Cool forms and reinforcing to a maximum of 90 degrees Fahrenheit by spraying with water prior to placing concrete.
- D. Do not use cement which has reached a temperature of 170 degrees Fahrenheit or more at the time it enters the concrete mix.

- E. Prevent plastic shrinkage cracking due to rapid evaporation of moisture.
- F. Do not place concrete when evaporation rate (actual or anticipated) equals or exceeds 0.20 pounds per square foot per hour, as determined by ACI 305.
- G. Set-retarding and water-reducing admixtures may be used with Engineer's approval when ambient air temperature is 90 degrees Fahrenheit or above to offset accelerating effects of high temperature.

3.07 Finishes. The following finishes shall be utilized on this project where indicated unless specified or detailed otherwise.

- A. Broom Finish. Use for sidewalks, slabs, curb and gutter.

After the concrete has been placed, consolidated, struck-off, and leveled by bull floating, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then be consolidated with power-driven floats of the impact type, except in thin sections, such as pan slabs which shall be floated by hand. Hand floating with wood or cork-faced floats shall be used in location inaccessible to the power-driven machine. Trueness of surface shall be rechecked at this stage with a 10-foot straight-edge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce planes checking true under the straight-edge in any direction, with tolerances not exceeding 1/4" in ten feet. The slab shall then be refloated immediately to uniform, smooth, granular texture. Create a coarse transverse scored texture by drawing a broom across the surface. Provide a uniform texture of constant color. On walkways, broom perpendicular to normal traffic direction. Broom finish to be of depth as approved by the Engineer.

- B. Troweled Finish. Use for slab picture frame or as specified or directed by the Engineer.

Where a troweled picture frame is specified, the surface shall be finished first with a broom finish. Troweling shall produce a smooth, hard, uniform surface. Do not over trowel.

- C. Rough Form Finish. Use for all formed surfaces not exposed to view.

Remove fins and other surface projections if they will interfere with adjoining work. Fill all tie holes and repair and patch all defects as directed by the Engineer.

3.08 Protection and Curing

- A. General. Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and shall be maintained without drying at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete as per these specifications.
- B. Initial Curing. Initial curing shall immediately follow the finishing operation. Concrete shall be kept continuously moist at least overnight. One of the following materials or methods shall be used:
 1. Ponding or continuous sprinkling.
 2. Absorptive mat or fabric kept continuously wet.
 3. Sand or other covering kept continuously wet.
 4. Curing compound conforming to "Specifications for Liquid Membrane-Forming Compounds for Curing Concrete" (ASTM C-390).
 5. Follow manufacturer's directions for curing of colored/tinted concrete.

Such compounds shall be applied in accordance with the recommendations of the manufacture and shall not be used on any surfaces against which concrete or other cementitious finishing materials are to be bonded, nor on surfaces on which such curing is prohibited by the project specifications.

- C. Final Curing. Immediately following the initial curing and before the concrete has dried, additional curing shall be accomplished by one of the following methods or materials:
1. Continuing the method used in initial curing.
 2. Waterproof paper conforming to "Specifications for Waterproof Paper for Curing Concrete" (ASTM C-171).
 3. Other moisture retaining covering as approved by Engineer.

Formed surfaces shall be final cured using waterproof sheets or paper, tightly sealed, or spray applied membrane curing compound Masterseal by Master Builders Co., Protex Triple Seal CCL-18, or approved equal, applied as soon as forms are removed.

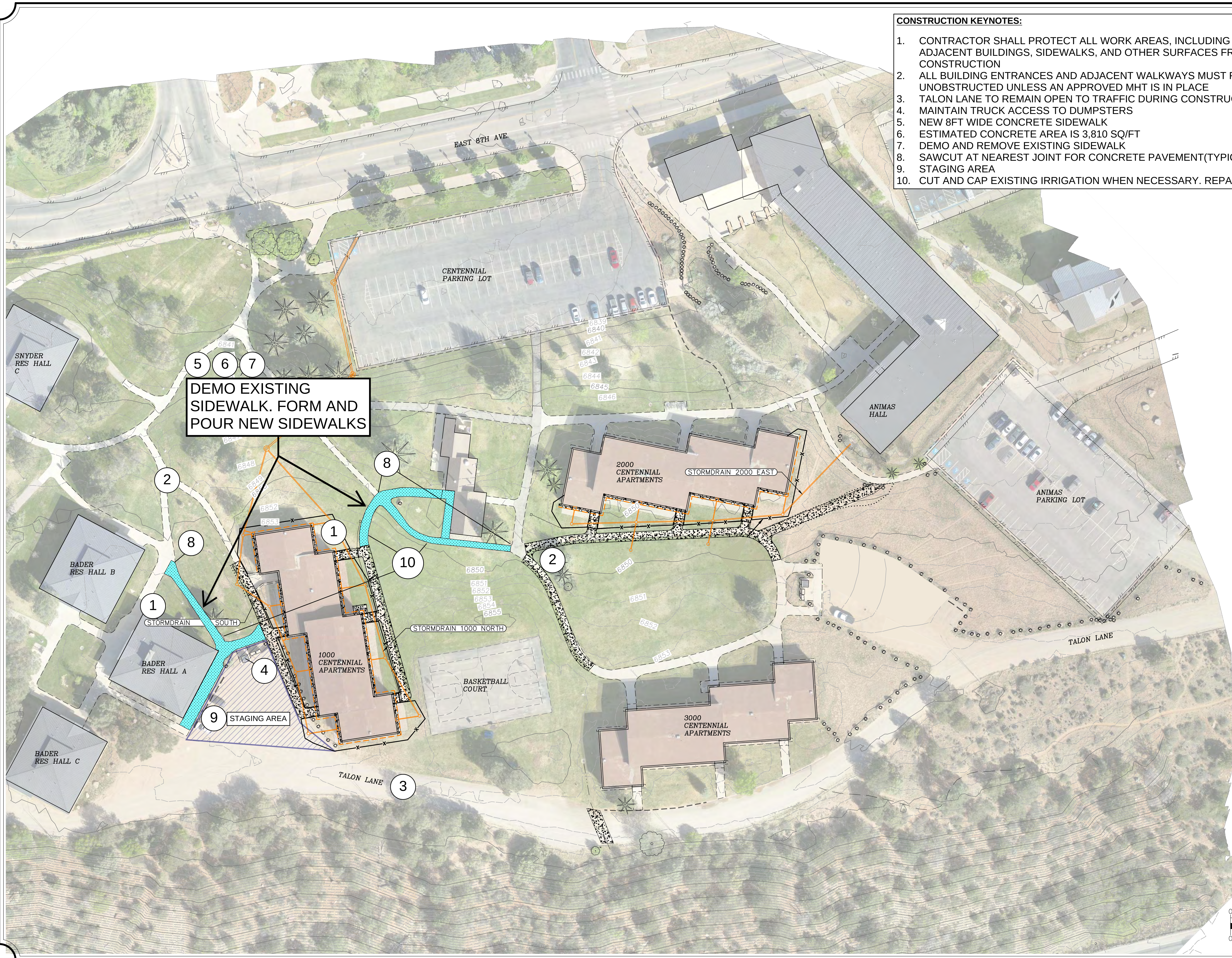
- D. Duration of Curing. The final curing shall continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which temperature of the air in contact with the concrete is above 50 degrees F. has totaled seven days. If high early strength concrete has been used, the final curing shall continue for a total of three days. Rapid drying at the end of the curing period shall be prevented.
- E. Formed Surfaces. All wood forms in contact with the concrete during the final curing period, one of the above curing materials or methods shall be employed immediately. Such curing shall be continued for the remainder of the curing period.

3.09 Protection from Mechanical Injury. During the curing period, the concrete shall be protected from damaging mechanical disturbances particularly load stress, heavy shock and excessive vibration. All finished concrete surfaces shall be protected from damage caused by construction equipment, materials, or methods and by rain or running water. The Contractor is responsible for the protection of his work prior to final acceptance including damage from vandalism. Self-supporting structures shall not be loaded in such a way as to over-stress the concrete.

3.10 Replacement, Repairing, and Patching of Defective Concrete

- A. Any concrete which, in the opinion of the Engineer, is out of position, out of alignment, out of level or slope, or otherwise out of required tolerances, or which shows a defective surface which cannot be properly repaired or patched (this includes incorrect color and finish) shall be removed and replaced at the Contractor's expense.
- B. After the forms have been removed, all concrete surfaces shall be inspected and any joints, voids, stone pockets or other defective areas shall be patched before the concrete is thoroughly dry. Defective areas shall be chipped away to a depth of not less than one inch with the edges perpendicular to the surface. The area to be patched and a space at least 6" wide entirely surrounding it shall be wetted to prevent absorption of water from the patching mortar. Do not patch any concrete in freezing weather.
- C. Unexposed formed surfaces of concrete shall be patched as directed by the Engineer.
- D. At the option of the Engineer, the bonding of the patching mortar to the acceptable concrete after necessary cutting and removal of porous or otherwise unacceptable concrete is completed may be done by the use of an approved bonding agent applied in accordance with the printed directions of the manufacture. Filling and finishing of the patch shall be completed as herein specified to the satisfaction of the Engineer.

End of Section



- CONSTRUCTION KEYNOTES:**
1. CONTRACTOR SHALL PROTECT ALL WORK AREAS, INCLUDING SOD, SEEDED AREAS, ADJACENT BUILDINGS, SIDEWALKS, AND OTHER SURFACES FROM DAMAGE DURING CONSTRUCTION
 2. ALL BUILDING ENTRANCES AND ADJACENT WALKWAYS MUST REMAIN OPEN AND UNOBSTRUCTED UNLESS AN APPROVED MHT IS IN PLACE
 3. TALON LANE TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION
 4. MAINTAIN TRUCK ACCESS TO DUMPSTERS
 5. NEW 8FT WIDE CONCRETE SIDEWALK
 6. ESTIMATED CONCRETE AREA IS 3,810 SQ/FT
 7. DEMO AND REMOVE EXISTING SIDEWALK
 8. SAWCUT AT NEAREST JOINT FOR CONCRETE PAVEMENT(TYPICAL)
 9. STAGING AREA
 10. CUT AND CAP EXISTING IRRIGATION WHEN NECESSARY. REPAIR BY OTHERS



FORT LEWIS COLLEGE

DURANGO, COLORADO

Issue Record:

Revisions:

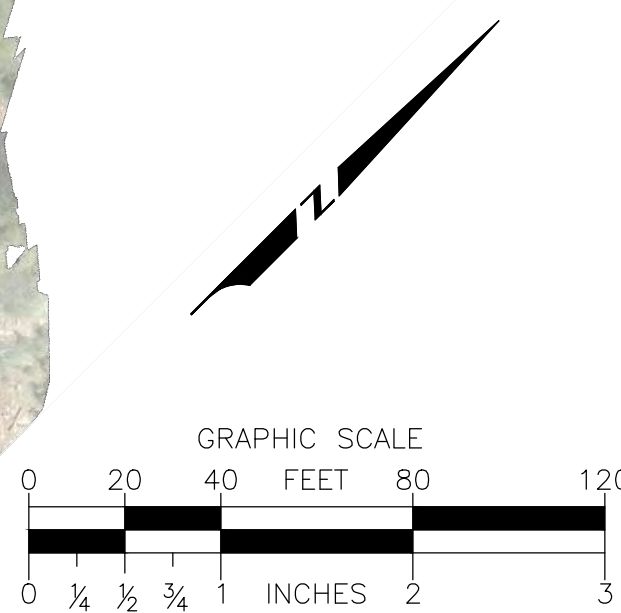
Project Number:

Designed by:

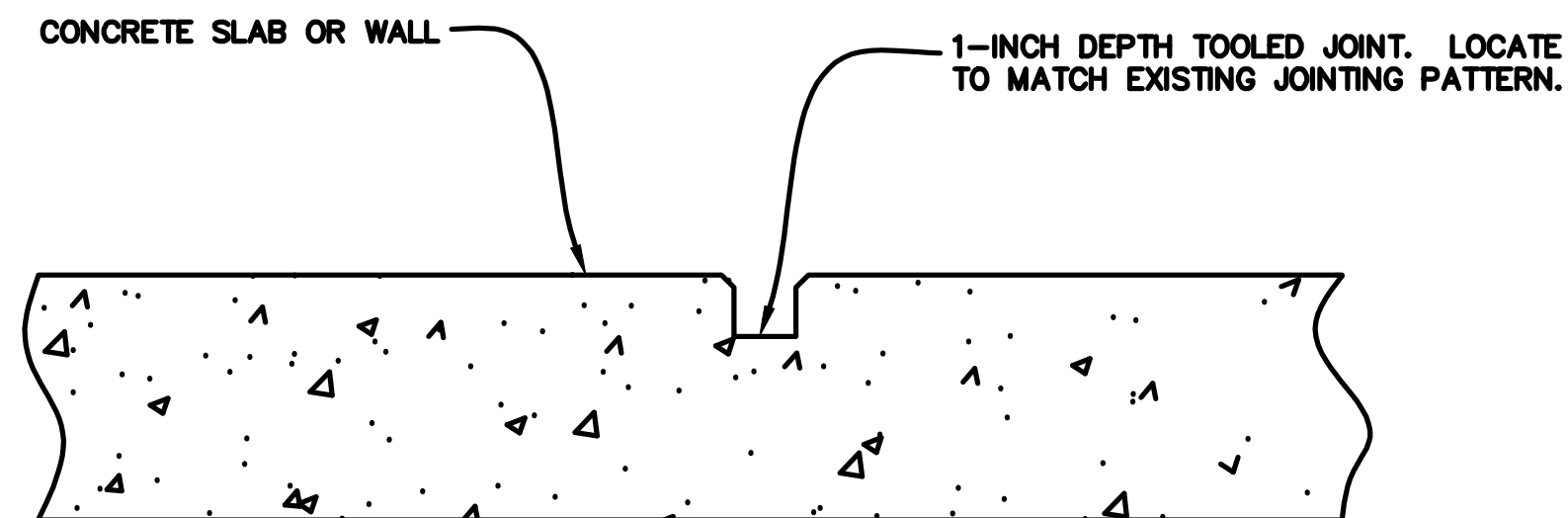
Checked By:

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OVERALL SITE PLAN

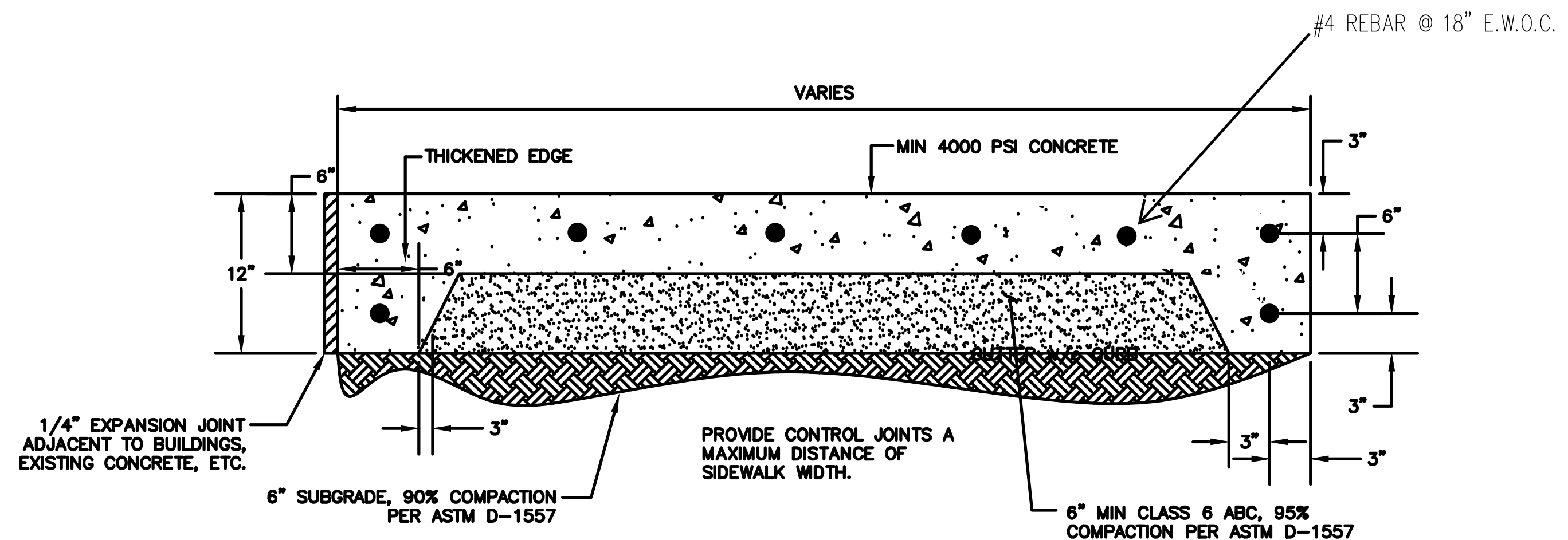


- 1) PROVIDE SPACING AS CALLED TO MATCH EXISTING JOINTING PATTERN, BUT NOT TO EXCEED MAX SPACING DISTANCE OF SIDEWALK WIDTH.
- 2) CONTROL JOINTS SHALL BE TOOLED AT 1-INCH DEEP AND 1/4" WIDE.
- 3) MATCH EXISTING JOINTING PATTERN, NOT TO EXCEED WIDTH OF PANEL.

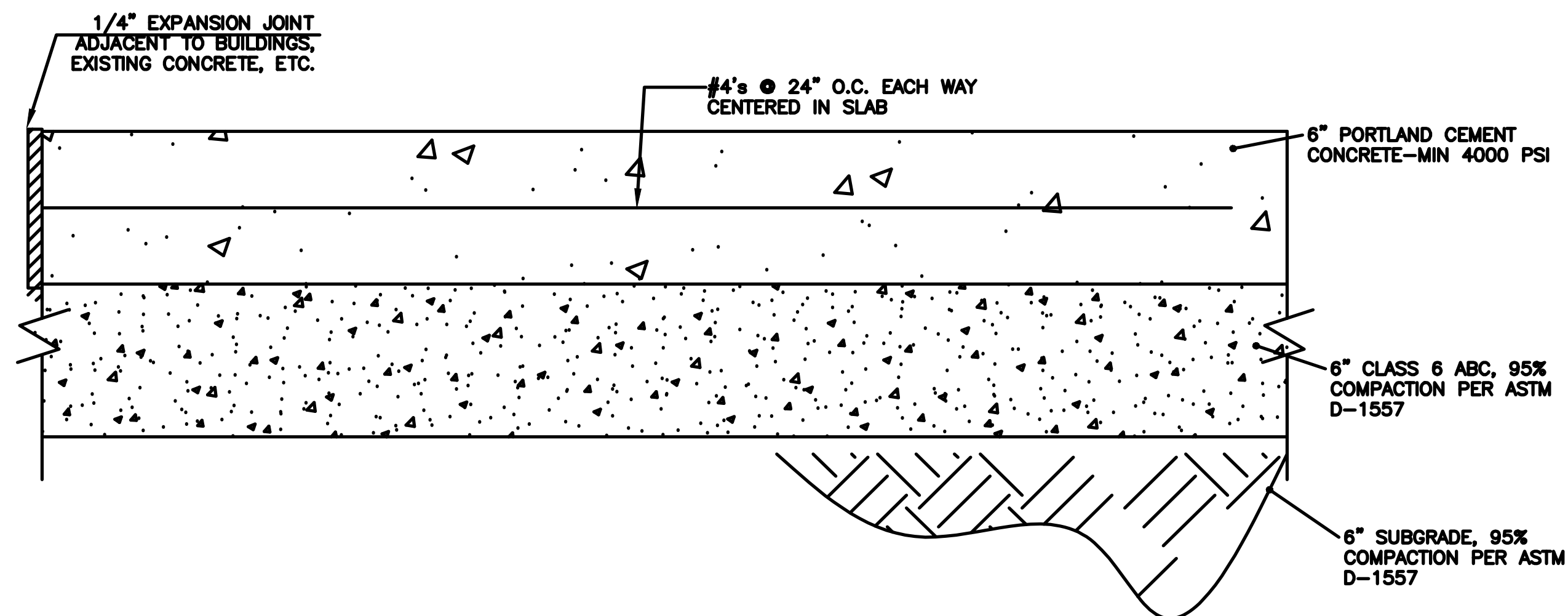


TYPICAL CONCRETE CONTROL JOINT
(NO SCALE)

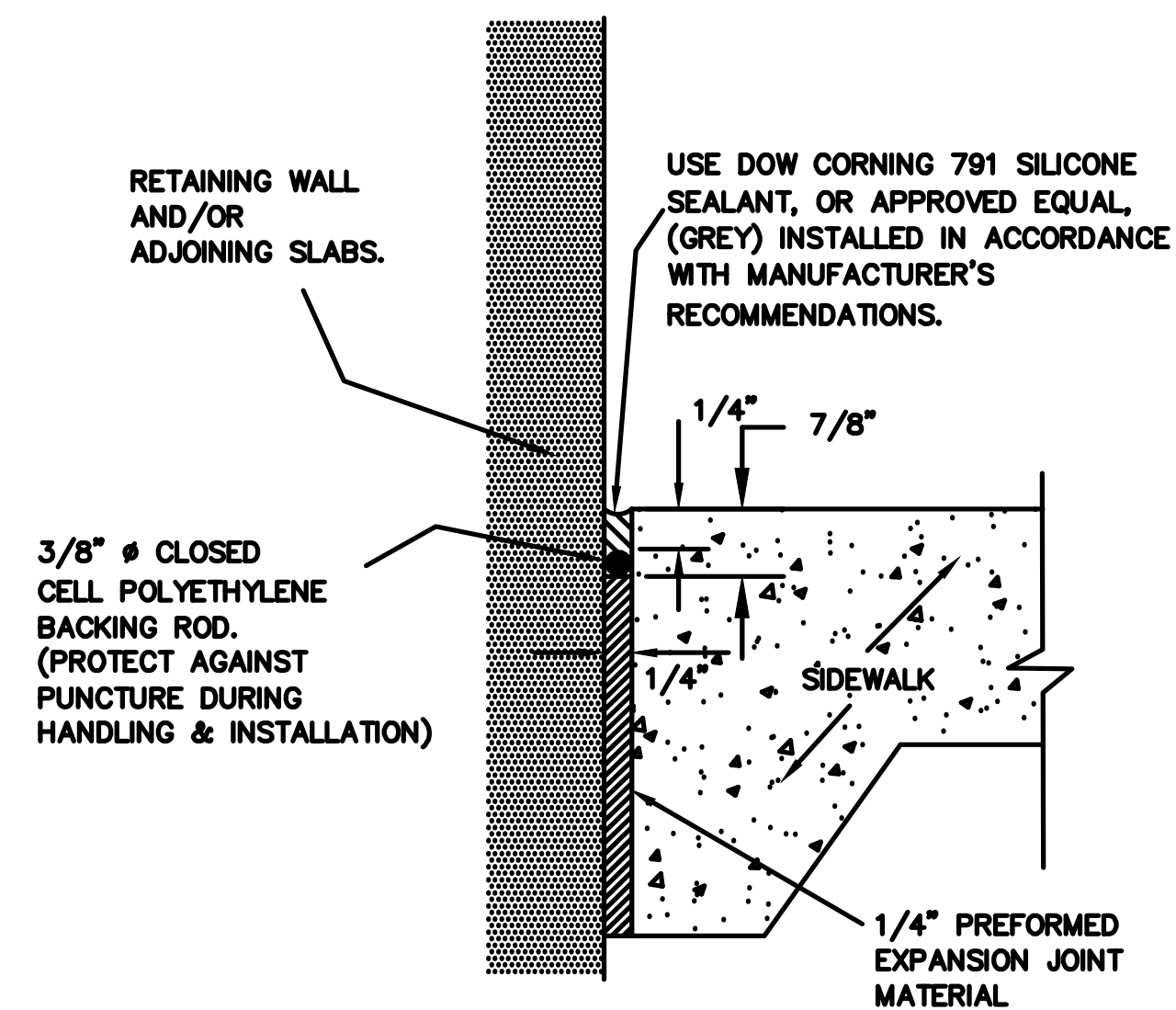
NOTE: PREPARED SUBGRADE TO CONSIST OF EITHER 12" MIN. THICKNESS OF COMPACTED STRUCTURAL FILL OR 6" MIN. THICKNESS OF SCARIFIED, MOISTURE CONDITIONED AND RECOMPACTED NATIVE SOIL. COMPACT PREPARED SUBGRADE TO AT LEAST 95% OF M.D.D. AS DEFINED BY ASTM D-1557.



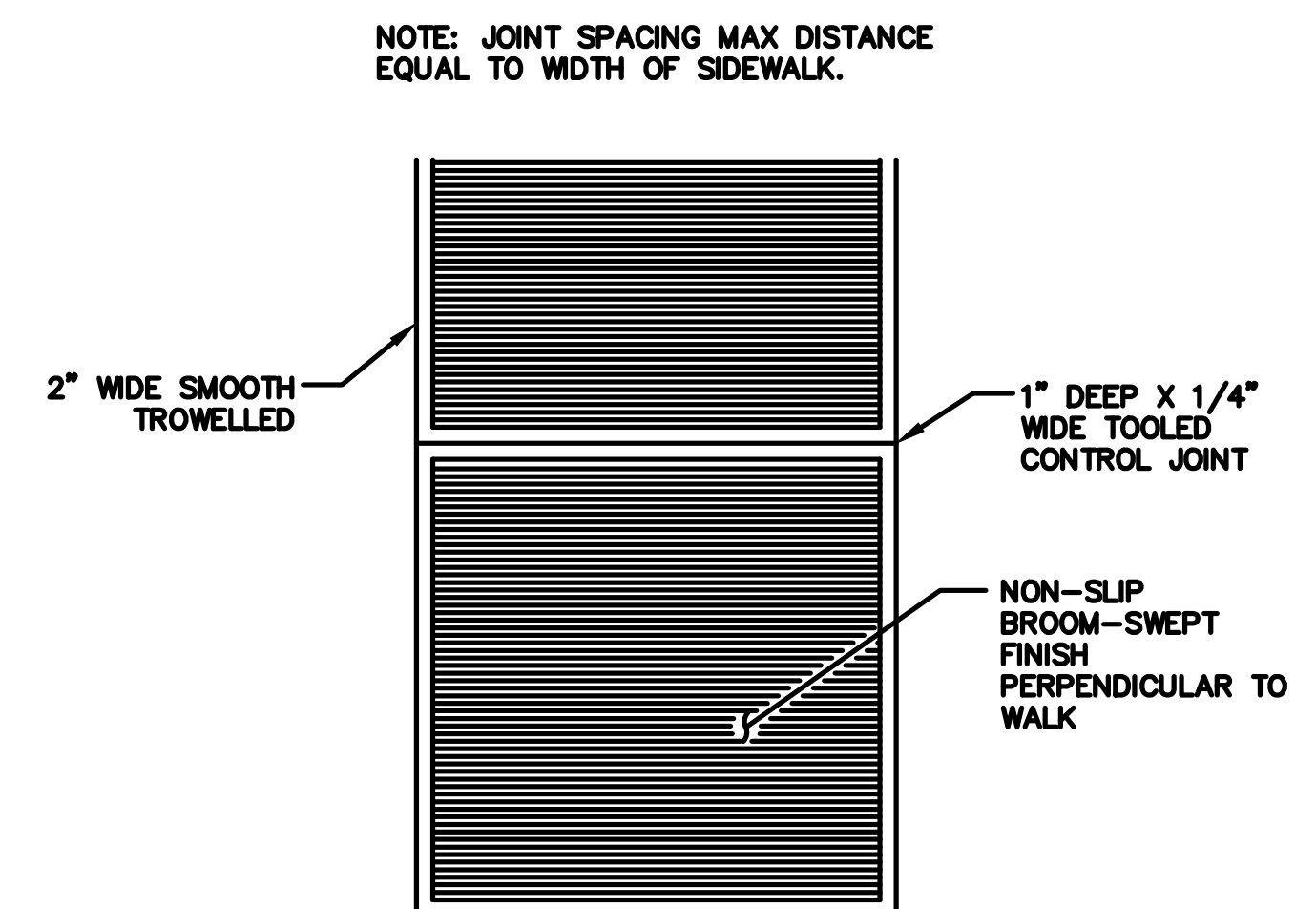
FLC STANDARD DETACHED SIDEWALK CROSS-SECTION
(NO SCALE)



MID-BLOCK SIDEWALK DETAIL
(NO SCALE)



SEALED ISOLATION JOINT
(NO SCALE)



FLC STANDARD SIDEWALK SURFACE FINISH
(NO SCALE)

FLC STANDARD SIDEWALK DETAILS