

INVITATION FOR BID

FINAL BID PACKAGE

Project Name: NWOS Bridge Install

IFB Number: IFB 2023-031

Bids Due
Date: 01/11/2024
Time: 2:00 p.m.



Prepared by City of Northglenn Public Works Department
11701 Community Center Drive
Northglenn, CO 80233

TABLE OF CONTENTS

VOLUME 1

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

INVITATION FOR BID
INSTRUCTION TO BIDDERS
BID FORM
BID SUMMARY
TRADE CONTRACTOR AGREEMENT
BOND FORM
NOTICE OF AWARD
NOTICE TO PROCEED
APPLICATION FOR PAYMENT FORM
REQUEST FOR INFORMATION FORM
FIELD CHANGE DIRECTIVE FORM
CHANGE ORDER FORM

VOLUME 2

DIVISION 00 – PLANS AND SPECIFICATIONS

CONSTRUCTION DRAWINGS
SPECIFICATIONS



BID NO _____

ISSUE DATE _____

INVITATION FOR BID (IFB) COVER SHEET

BID TITLE: _____

SUBMISSION DEADLINE: _____ on _____

SUBMIT BID TO: City Clerk's Office
11701 Community Center Dr
Northglenn CO 80233
or
bids@northglenn.org

CONTACT: _____

EMAIL: _____

PHONE: _____

Bidding instructions and drawings are available at the Rocky Mountain E-Purchasing website or at: https://www.northglenn.org/government/bids_with_the_city.php

MANDATORY PREBID CONFERENCE: _____

DATE & TIME: _____ at _____

LOCATION: _____

The undersigned hereby affirms that (1) they are a duly authorized agent of the vendor, (2) they have read all terms and conditions, requirements, and instructions of this bid as stated or implied, (3) the vendor warrants that they are familiar with all provisions of the contract documents and technical specifications which were made available in conjunction with this solicitation and fully understands and accepts them unless specific variations have been expressly listed in their offer, (4) that the offer is being submitted on behalf of the vendor in accordance with any terms and conditions set forth in this document, and (5) that the vendor listed on the bid submission must match all contract and insurance documents submitted upon award.

PRINT OR TYPE YOUR INFORMATION

Company _____ Fax Number _____

Address _____ City, State Zip _____

Contact Person _____ Title _____

Email _____ Phone _____

Signature _____

Print Name _____

INSTRUCTIONS TO BIDDERS

1. **BID NO:** _____

2. **BID TITLE:** _____

3. **PURPOSE OF SOLICITATION:**

4. **SCHEDULE OF ACTIVITIES:** The following schedule of activities delineates the timing of the solicitation and the estimated project schedule. These dates may be subject to change at the City's discretion.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5. **BID SUBMITTAL REQUIREMENTS:** Vendors must provide the following information.

- **Cover Sheet.** Include the completed Cover Sheet.
- **Prices.** Prices must be provided on the forms provided. The vendor shall not alter forms (e.g. add or modify categories for posting prices offered) unless expressly permitted to do so. No other form shall be accepted.
- **Submission Timeline.** It is the responsibility of the submitting vendors to ensure timely receipt by the City. The City reserves the right to reject any late submittals. Bids must be received no later than _____ on _____.

6. **INTERPRETATION OF DOCUMENTS AND SPECIFICATIONS:** Wherever the word "contract" appears, it shall be held to include all the documents as listed. No less than all of the parts of the contract documents shall constitute the formal contract. If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of specifications, schedules, or information sheets or the proposed contract documents, they may submit to the project manager a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt and actual delivery. Any interpretation of such documents will be made only by an addendum duly issued, and a copy of such addendum will be mailed or delivered to each person receiving a set of such documents. The City will not be responsible for any explanation or interpretation of such documents which anyone presumes to make on behalf of the City.

- 7. TERMS AND CONDITIONS:** As set forth in the contract agreements and any supplemental, the following terms and conditions will apply to this Invitation for Bid, each vendor's bid and to the negotiations, if any, of any said contract. The City will consider specific recommended changes that clarify the intent of the agreement. **The City will not consider contract changes that have not been specifically identified in your proposal response.** A general statement suggesting that, if selected, you reserve the right to discuss contract issues at a later date will not be accepted and will be grounds for disqualification. Submission of a bid in response to this IFB indicates the vendor's acceptance of the terms and conditions contained in this document and the contract.
- 8. BIDDER EXPENSES:** The City of Northglenn will not be responsible for any expenses incurred by any vendor in preparing and submitting an offer.
- 9. BID:** All bids must be made on the forms provided. No alterations in bids or in the printed forms thereof, by erasures, deletions, or interpolations will be acceptable unless each alteration is signed or initialed by the vendor. If initialed, the City may require the vendor identify the alteration so initialed. If mailed or delivered, each bid must be enclosed in a sealed envelope labeled with the words _____.
- The bid shall be submitted to the City of Northglenn, Office of the City Clerk, 11701 Community Center Drive, Northglenn, Colorado 80233-8061.
- 10. WITHDRAWAL:** A vendor may withdraw their bid at any time prior to the expiration of the final date and time set for receipt of bids. Withdrawal notification must be in written form, and must be received in the Offices of the City Clerk prior to the closing date and time.
- 11. IRREVOCABILITY:** Following the time of closing, all bids will become irrevocable offers to the City and will remain as such until 90 days from date of submission. By submission of a bid, the vendor agrees to enter into a contract. In addition all quoted prices will be firm and valid up to 90 days from date of submission. The City may, in its sole discretion, release any bid and return any bonds if applicable prior to the 90 days.
- 12. LATE BIDS:** Any Bids received after the Final date and time for receipt of Bids will not be accepted and will be unopened and discarded without being considered.
- 13. SIGNATURES OF VENDORS:** Each vendor shall sign their bid, using their legal signature and giving their full business address. The person signing the bid must be an officer of the company or partnership. Bids by partnerships shall be signed with the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the President, Secretary, or other persons authorized to bind it in the matter. The names of all persons signing should also be printed below the signature. A bid by a person who affixes to their signature the word, "President", "Secretary", "Agent" or other designation without disclosing their principal, may be held to be a bid of the individual signing. When requested by the City, satisfactory evidence of the authority of the officer signing in behalf of the corporation shall be furnished. Bids submitted electronically are to be typed in lieu of written signature (see the cover letter).
- 14. OPEN RECORDS ACT:** Notwithstanding any language contained in a bid to the contrary, all bids submitted to the City become the property of the City. Any information considered proprietary should be marked by the vendor and as such and will be kept confidential to the extent provided by law.
- 15. SALES TAX:** Vendors shall not include federal, state, or local excise, sales or use taxes in prices offered, as the City is exempt from payment of such taxes.
- 16. MISTAKES IN BIDDING INSTRUCTIONS:** If the City makes a mistake in drafting the bidding instructions or any other contract documents, the City reserves the right to reject any or all bids, or to require that vendors submit an alternate bid with adjustments made to correct the error(s). Such errors will be set forth in an addendum. If the vendor has already been selected and has started performing work under the contract, and the City then discovers a mistake in the contract documents for which the City is responsible, the City may opt to reform the contract. If the mistake causes the vendor to receive compensation for materials not used in the work or for labor that would not be required for the work, the contract price shall be decreased

proportionally. If the mistake causes the vendor to fail to bid on work which must be performed in order to properly complete the contract, the City may increase the contract price to equal the proportionate increase in the cost of required materials and labor caused to the vendor. In the alternative, the City may solicit bids for such additional work, or the City may reassign such additional work to another vendor, as the City deems appropriate. Nothing in this provision shall apply to mistakes made by the vendor in completing the bid form or in performing the contract.

17. BID RESULTS: Vendors desiring to know bid results must enclose a self-addressed, stamped envelope with their bid. A bid summary sheet will be mailed after the bid opening. No bid results will be given over the telephone. Vendors attending the bid opening will receive a copy of the results after the opening of the bids.

18. ACCEPTANCE OF BID: It is expressly understood and agreed that the City reserves the right to reject any or all bids, to waive formalities, and accept the bid which appears to be in the City's best interest.

19. APPEAL OF AWARD: Solicitations will be awarded based on multiple criteria, price being just one of the conditions. Vendors can review the solicitation's special terms and conditions for information on evaluation criteria. Vendors may appeal the award decision by submitting, in writing, to the City of Northglenn, a request for reconsideration within 7 calendar days after the posting of the Notice of Intent to Award, provided that the appeal is sought by the vendor prior to the City finalizing a contract with the selected vendor. Vendors who were deemed non-responsive are ineligible to participate in the appeal process.

20. DEFENSE OF SUITS: In case any action at law or suit in equity is brought against the City, any officer, employee, or agent thereof, for or on account of the failure, omission, or neglect of the vendor to do and perform any of the covenants, acts, matters, or things by this contract undertaken to be done or performed, or for the injury or damage caused by the negligence of the vendor or their subcontractors or their or their agents, or in connection with any claim or claims based on the lawful demands of subcontractors, workmen, material, men or suppliers or machinery and parts thereof, equipment, power tools and supplies incurred in the fulfillment of the contract, the vendor shall indemnify and save harmless the City, officers, employees, and agents of the City, of and from all losses, damages, costs (including attorney's fees), expenses, judgments, or decrees whatever arising out of such action of suit that may be brought as aforesaid.

21. CONTRACT NEGOTIATIONS: If the City decides to proceed and to negotiate a contract, the City intends to provide written notification to the vendor whose bid is deemed by the City to be in the best interests of the City and the City will attempt to negotiate a contract with the selected vendor(s) on terms and conditions stated in this IFB or in the successful vendor's bid, but shall also include terms and conditions later negotiated. If the City and the successful vendor are unable to execute a contract and the vendor has been notified that it is the successful vendor then the City may cease all discussions with the (first) successful vendor without any further obligation to that vendor and select another (second) vendor as the successful vendor. If the (second) vendor is rejected, as per the terms above, then the City, without any further obligation to that vendor, may select another (third) vendor as the successful vendor and so on, or the City reserves the right to reject all bids and re-bid.

BID FORM

City of Northglenn
11701 Community Center Drive
Northglenn, Colorado 80233-8061

BID: Pursuant to the "advertisement for bids" for the above named project, and being familiar with all contractual requirements therefore, the undersigned bidder hereby proposes to furnish all labor, materials, tools, supplies, equipment, transportation, services and all other things necessary for the completion of the contractual work, and perform the work in accordance with the requirements and intent of the contract documents, within the time of completion set forth herein, for, and in consideration of the following prices.

Proposal of _____ (hereinafter called **BIDDER**) organized and existing under the laws of the State of _____ doing business as _____*.
To the **CITY OF NORTHGLENN** (hereinafter called **CITY**). In compliance with your advertisement for bids, **BIDDER** hereby proposes to perform WORK on

_____ - _____

in strict conformance with the **CONTRACT DOCUMENTS**, within the time set forth therein, and at the prices stated below.

By submission of this **BID**, each **BIDDER** certifies, and in case of a joint **BID** each party thereto certifies as to their own organization that this **BID** has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this **BID** with any other **BIDDER** or with any competitor.

BIDDER hereby agrees to commence **WORK** under this contract on or before a date to be specified in the **NOTICE TO PROCEED** and to fully complete the **PROJECT** as indicated in the General Conditions.

BIDDER acknowledges receipt of the following **ADDENDUM**:

*Insert "a corporation", "a partnership", or "an individual" as applicable.

Sub-contractors (if any): Work they will perform:

1. _____ Email: _____

2. _____ Email: _____

3. _____ Email: _____

Please provide a complete and accurate list of at least three references and contact phone numbers:

1. _____ Phone: _____

Email: _____

2. _____ Phone: _____

Email: _____

3. _____ Phone: _____

Email: _____

Respectfully submitted,

(Seal, if Bid is by a Corporation)

Attest

Signature

Address

Title

Date

License Number
(If Applicable Signature)

Phone Number



Bid Form

© 2023 **J&T Consulting, Inc.**

Item Number	Description	Quantity	Unit	Unit Price	Total Price
<u>Base Bid</u>					
1	Project Mobilization/Demobilization/Bonds/Insurance	1	LS		
2	Erosion Control	1	LS		
3	Construction Staking	1	LS		
4	Pedestrian/ Traffic Control, including Temporary Path around Site	1	LS		
5	Sod Landscape Restoration and Irrigation Repair of All Disturbed Areas	1	LS		
6	Remove 6" Thick Sidewalk, Complete in Place	10	SY		
7	6" Thick Sidewalk with 12" CDOT Class 6 Road Base, Complete in Place	47	SY		
8	Bridge Abutments with Footer, Complete in Place	1	LS		
9	Sand Blast Bridge and Paint, Complete in Place	1	LS		
10	Bridge Repair Allowance, as Directed by City	1	LS		
11	Transportation of Existing Bridge and Installation of Bridge, Complete in Place	1	LS		
12	Flowfill Backfill, Complete in Place	25	CY		
13	12" Thick Type VL Grouted Riprap, Complete in Place	90	SY		
14	Site Grading	1	LS		
15	Dewatering, as Required	1	LS		
Total Base Bid					

Total Price in Words Base Bid Total _____

This bid schedule is understood to be all inclusive of the work shown on the contract documents. Items that are not specifically indicated by an individual bid item are understood to be incidental and included in the lump sum cost of a related bid item.

Signature _____

Company _____

BID SPECIFICATIONS

TRADE CONTRACTOR AGREEMENT

TABLE OF CONTENTS

ARTICLE 1 - GENERAL PROVISIONS AND SERVICES..... 1

ARTICLE 2 - DEFINITIONS 1

ARTICLE 3 - DESCRIPTION OF WORK AND SERVICES 3

ARTICLE 4 – TRADE CONTRACTOR'S CONSTRUCTION SCHEDULE 13

ARTICLE 5 - TIME FOR COMPLETION AND LIQUIDATED DAMAGES..... 15

ARTICLE 6 - CONTRACT SUM..... 17

ARTICLE 7 - CORRECTION OF WORK..... 17

ARTICLE 8 - TEMPORARY FACILITIES AND SERVICES 19

ARTICLE 9 - INDEMNIFICATION AND INSURANCE 19

ARTICLE 10 - PERFORMANCE, LABOR AND MATERIAL PAYMENT BONDS..... 19

ARTICLE 11 – CLAIMS AND DISPUTES..... 20

ARTICLE 12 - RESOLUTION OF CLAIMS AND DISPUTES..... 24

ARTICLE 13- TERMINATION..... 22

ARTICLE 14 - SIMULTANEOUS WORK BY OTHERS..... 26

ARTICLE 15 - SUBCONTRACTING 27

ARTICLE 16 - GUARANTY 25

ARTICLE 17 - SALES TAX..... 28

ARTICLE 18 - MISCELLANEOUS PROVISIONS 28

ARTICLE 19 - ATTACHMENTS, SCHEDULES AND SIGNATURES.....31

TRADE CONTRACTOR AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____, 20____, by and between the City of Northglenn, State of Colorado, a Colorado home rule municipal corporation, hereinafter referred to as the "City" or "Owner" and _____, hereinafter referred to as the "Trade Contractor".

ARTICLE 1 - GENERAL PROVISIONS AND SERVICES

- A. The Trade Contractor will commence and fully complete the construction of the Project, which is described in **Exhibit A**, which is attached hereto and made a part hereof ("Project").
- B. The Trade Contractor will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the project described herein.
- C. The Trade Contractor will commence the work required by the contract documents within ten (10) calendar days after the date of the notification to proceed and will complete the same within _____ (_____) day, unless the period for completion is extended otherwise by the contract documents. The Trade Contractor agrees to pay as liquidated damages, and not as a penalty, the sum of _____ (\$ _____) for each consecutive calendar day's delay in completing this Contract after the completion date specified herein, excluding any approved extensions of time because of unavoidable delay.
- D. The Trade Contractor agrees to perform all of the work described in the contract documents and to comply with the terms therein for an amount not to exceed _____ (\$ _____) as described in Article 5 of this Agreement.

ARTICLE 2 - DEFINITIONS

- A. Wherever used in the contract documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:
1. Addenda - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the contract documents, drawings and specifications, by additions, deletions, clarifications or corrections.
 2. Architect - The Architect shall be _____
 3. Bid - The offer or proposal of the bidder submitted in the prescribed form setting forth the prices for the work to be performed.
 4. Bidder - Any person, firm or corporation submitting a bid for the work.
 5. Bonds - Bid, performance and payment bonds and other instruments of security, furnished by the Trade Contractor and his surety in accordance with the contract documents.
 6. Change Order - A written order to the Trade Contractor authorizing an addition, deletion or revision in the work within the general scope of the contract documents or authorizing an adjustment in the contract price and/or contract time.
 7. Contract Documents - The contract, including advertisement for bids, information for bidders, bid, bid bond agreement, bid schedule, labor and material, payment bond, performance bond, notice of award, notice to proceed, change order, general conditions, special conditions, general specifications, special specifications, scopes of work, addenda, drawings, schedules and any and all other documents or papers included or referred to in the foregoing documents are part of the Contract Documents
 8. Contract Price - The total monies payable to the Trade Contractor under the

terms and conditions of the contract documents.

9. Contract Time - The number of calendar days stated in the contract documents for the completion of the work.

10. Date of Award - Date of award of contract shall mean the date formal notice of such award, approved by the Owner, has been delivered to the intended awardee, or mailed to him at the main business address shown in his proposal by the Owner or it's authorized representative.

11. Day or Days - Unless herein otherwise expressly defined, "day" shall mean calendar day or days.

12. Drawings, Plans or Contract Documents - The part of the contract documents which shows the characteristics and scope of the work to be performed and which has been prepared or approved by the Engineer and/or Architect.

13. Engineer shall be

14. Field Order - A written order effecting a change in the work not involving an adjustment in the contract price or an extension of the contract time, issued by the Engineer or the Owner to the Trade Contractor during construction.

15. Major Equipment or Major Equipment Items - Installation of major equipment to be furnished and placed under the contract awarded to the Trade Contractor and/or installations of major equipment to be furnished by the Owner and received, unloaded, stored, and placed under the contract awarded to the Trade Contractor.

16. Notice of Award - The written notice of the acceptance of the bid from the Owner to the successful bidder.

17. Notice to Proceed - Written communication issued by the Owner to the Trade Contractor authorizing him to proceed with the work and establishing the date of commencement of the work.

18. Owner or City - The City of Northglenn, Colorado, a home rule municipality. The Public Works Director of the Owner, or his designee, is the Owner's representative.

19. Project - Construction of the project described in **Exhibit A**.

20. Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by the Trade Contractor, a subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

21. Site - The lands and other places on, under, in, or through which the work is to be executed or carried out and any other lands or places provided by the Owner for the purposes of the contract together with such other places as may be specifically designed in the contract documents as forming part of the site.

22. Special Conditions - Supplemental conditions that apply to specific aspects of the project or modifications to the general conditions that are to be adhered to in the project.

23. Subcontractor - An individual, firm or corporation having a direct contract with the Trade Contractor or with any other subcontractor for the performance of a part of the work at

the site.

24. Substantial Completion - That date as certified by the Owner when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the contract documents, so that the project or specified part can be utilized for the purposes for which it is intended.

25. Suppliers - Any person, supplier, or organization who supplies materials or equipment for the work, including that fabricated to a special design, but who does not perform labor at the site. A supplier is not a subcontractor who purchases an item of equipment from a manufacturer.

26. Trade Contractor - The person, firm or corporation with whom the City of Northglenn has executed this Agreement.

27. Work - All labor necessary to produce the construction required by the contract documents, and all materials and equipment incorporated or to be incorporated in the project. The work and the project are used interchangeably to mean the same thing.

28. Written Notice - Any notice to any party of the Agreement relative to any part of the Agreement in writing and considered delivered and the service thereof completed when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the work.

ARTICLE 3 - DESCRIPTION OF WORK AND SERVICES

Section 1. Drawings and Specifications.

- A. The intent of the drawings and specifications is that the Trade Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the work in accordance with the contract documents and all incidental work necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the Owner.
- B. Up to three (3) copies of the drawings and specifications will be furnished to the Trade Contractor without charge upon request, and any additional copies which the Trade Contractor may request will be furnished at the cost of reproduction. The drawings and specifications are to be used only in connection with the work specified herein and, with the exception of the signed contract set and As-Built drawings, are to be returned at the completion of the contract.
- C. In case of conflict between the drawings and specifications, the drawings will govern. In case of conflict between the special specifications and the general specifications, the special specifications shall govern. Figure dimension on drawings will govern over scale dimensions, and detailed drawings will govern over general drawings. Notwithstanding the above, a document which is more restrictive or requires greater responsibility or increased compliance by the Trade Contractor shall govern.
- D. Any discrepancies found between the drawings and specifications and site conditions or any inconsistencies or ambiguities in the drawings or specifications shall be immediately reported to the Owner, in writing, who will promptly resolve such inconsistencies or ambiguities in writing. Work done on unreported discrepancies, inconsistencies or ambiguities by the Trade Contractor shall be done at the Trade Contractor's risk.
- E. The Trade Contractor may be furnished additional instructions and detail drawings, by the Owner, as necessary to carry out the work required by the contract documents. All additional

instructions and detail drawings shall be issued to the Trade Contractor by the Owner.

F. The additional drawings and instructions thus supplied will become a part of the contract documents. The Trade Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

Section 2. Materials, Services and Facilities.

A. It is understood that, except as otherwise specifically stated in the contract documents, the Trade Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the work within the specified time.

B. In addition to the requirements for major equipment items previously given, within fourteen (14) days after execution of the Contract, the Trade Contractor shall submit to the Owner and Engineer a complete listing of the manufacturers of each item of equipment or assembly fabricated off the site which he proposed to furnish for the project, together with sufficient information, including shop assembly and detail drawings, manufacturers' specifications and performance data, to demonstrate clearly that the materials and equipment to be furnished comply with the provisions and intent of the contract documents. If the information shows any deviation from the Contract requirements, the Trade Contractor shall advise the Engineer and Owner of the deviation and state the reason for it in writing.

C. Only first-class materials and materials which conform to the requirements of the specifications shall be incorporated in the work. All materials shall be new unless specified to be otherwise.

D. When requested by the Owner, the Trade Contractor shall furnish a written statement of the origin, composition, and manufacturer of any or all materials (manufactured, produced or grown) that are to be used in the work. The sources of supply of each material used will be approved by the Owner before delivery is started. If, at any time, sources previously approved, fail to produce materials acceptable to the Owner, the Trade Contractor shall furnish materials from other sources.

E. Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the work shall be located so as to facilitate prompt inspection.

F. Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

G. Materials, supplies, and equipment shall be in accordance with samples submitted by the Trade Contractor and approved by the Engineer or Architect.

H. Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Trade Contractor or the subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

I. The Trade Contractor shall retain, for the benefit of the Owner, all materials and supplies that are purchased for the project but are not used as a part of the project. The Owner may take any of the materials and supplies that are used in the project for any City purpose. Any materials and supplies not taken by the Owner shall be removed from the project site by the Trade Contractor.

Section 3. Shop Drawings.

A. The Trade Contractor shall submit shop drawings, samples and O&M manuals as may be necessary for the prosecution of the work as required by the contract documents on a timely basis so that the project schedule is not affected. The Engineer will promptly review all shop drawings. All such drawings will be approved and signed by the Engineer, and will be null and void unless authorized by such signature. The Engineer's approval of any shop drawing will not release the Trade Contractor from responsibility for deviations from the contract documents. The approval of any shop drawings which substantially deviates from the requirements of the contract documents shall be evidenced by a change order.

B. All drawings and details on items of major equipment will be reviewed by the Engineer only after the complete set of drawings and details covering the entire equipment package to be furnished under a particular major equipment item are submitted. Drawings submitted on a piecemeal basis covering only parts of the equipment package will be held for checking until the entire set of drawings are received.

C. The Trade Contractor shall also submit to the Engineer shop drawings showing all necessary detail for the proper installation of materials into the completed work, as provided by this Agreement.

D. The Trade Contractor shall make any indicated corrections on the drawings returned and shall resubmit corrected drawings until final approval is obtained.

E. The Trade Contractor shall have no claims for damages or extension of time on account of any delay in the work resulting from the rejection of material or from review, revision and resubmittal of drawings when the review, revision and resubmittal is due to changes to the original design documents, and other data for approval by the Engineer.

F. Each shop drawing shall be dated and shall be identified with the name of the project, the division, if any, the Contract item number, and the name of the Trade Contractor.

G. When submitted for the Engineer's review, shop drawings shall bear the Trade Contractor's certification that he has reviewed, checked and approved the shop drawings and that they are in conformance with the requirements of the contract documents.

H. The Trade Contractor shall submit the shop drawings in accordance with the general requirements.

I. Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved sample shall be kept in good order by the Trade Contractor at the site and shall be available to the Engineer.

J. By approving and submitting shop drawings and samples, the Trade Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each shop drawing and sample with the requirements of the work and of the contract documents.

Section 4. Records, Accounts and Audits.

A. The Trade Contractor agrees to keep one complete set of records and books of account on a recognized cost accounting basis (satisfactory to the Engineer), showing all expenditures, of whatever nature, made pursuant to the provisions of this Contract.

B. The Trade Contractor shall furnish the Engineer and Owner with such records, information and data as may be reasonable. The Engineer and Owner shall at all reasonable times be afforded the opportunity to inspect and/or audit the above-specified books and records of said Trade Contractor.

Section 5. Inspection and Testing.

A. All materials and equipment used in the construction of the project will be subject to adequate inspection and testing in accordance with generally accepted standards.

B. The Trade Contractor shall give sufficient advance notice of placing orders to permit tests to be completed before materials are incorporated in the work.

C. The Owner will provide all inspection and testing services required by the Contract Documents, unless specifically noted in the contract specifications for special inspection and testing services, such as, by way of example, welding inspections on off-site assembly.

D. Neither observations by the Engineer, and Owner, tests nor approvals by persons other than the Engineer and Owner will relieve the Trade Contractor from his obligations to perform the work in accordance with the requirements of the contract documents.

E. The Engineer, the Owner, and their representatives will at all times have access to the work and to locations where materials or equipment are being manufactured, stored, or prepared for use under these contract documents, and they shall have full facilities for unrestricted inspection of such materials, equipment, and work including full access to purchasing and engineering information, but not including prices, to the extent of uncovering, testing, or removing portions of the finished work. The Engineer and Owner shall be furnished with such information as may be required regarding materials used and the process of manufacture for the various items of equipment. Inspections by the Engineer and Owner of equipment or materials during its manufacture will be performed by or for the Owner solely in an effort to detect discrepancies and defects as early as possible, when they can be most readily corrected, and the work thereby expedited. No acceptance of equipment or materials will be construed to result from such shop inspections by the Engineer and Owner. Any inspections or tests or waivers thereof will not relieve the Trade Contractor of responsibility for meeting all requirements of these contract documents.

F. In addition, authorized representatives and agents of any participating federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Trade Contractor shall provide proper facilities for such access and observation of the work and also for any inspection or testing thereof.

G. In case of disputes between the Trade Contractor and the Engineer as to materials furnished or manner of performing the work, the Owner will have authority to reject materials or suspend the work until the question at issue can be decided by the Owner. The Owner is authorized to revoke, alter, enlarge, relax or release any requirements of these specifications, and to approve or accept any portion of the work, and to issue instructions contrary to the drawings and specifications.

Section 6. Construction Review

A. The Engineer will periodically observe the construction of all work covered by this Contract. The Engineer, on behalf of the Owner, shall be authorized to determine the amount or quantities of the several items of work which are to be paid for under this Contract; to order field changes within the scope of the Contract and to render decisions on any questions which may arise relative to the execution of the work covered by this Contract. The Engineer does not have authority to suspend work on the project. The Trade Contractor shall not suspend any portion of the work nor resume suspended work without the written authority of the Owner.

B. Neither Engineer's authority to act under the Contract nor any decision made by Engineer in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the Engineer to the Trade Contractor, any subcontractor, any supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

C. Whenever in the drawings, plans or Contract Documents the terms "as ordered", "as directed", or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of Engineer as to the work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the work for compliance with the contract documents. The use of any such term or adjective shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility for the project. Neither the Owner nor the Engineer will be responsible for the acts or omissions of Contractor or any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

D. Periodic observation of the work in progress by the Engineer will be done whenever the Contractor is performing work that requires review as determined by the Engineer. The normal working time shall be during a regular 5-day, 40-hour work week, Monday through Friday. If the Trade Contractor elects to work more than 40 hours per week and observation is required during this overtime work as determined by the Engineer, the Engineer shall be paid by the Trade Contractor at the rate as specified herein for all review time required over the normal 5-day, 40-hour week. If the Engineer or his authorized representative is called to the job site to address problems created by the Trade Contractor, he will be paid by the Trade Contractor at the same rate as for overtime review as stated above. This payment shall be made by a credit to the Owner, and then the Engineer shall bill the Owner for the same.

E. If any work has been covered which the Engineer has not been specifically requested to observe prior to its being covered, or if the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Trade Contractor at the Engineer's request shall uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the work in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such work is defective, the Trade Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, the Trade Contractor will be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate change order will be issued.

Section 7. Surveys, Permits and Regulations.

A. The Owner will furnish any existing land surveys in the Owner's possession. Provided however, the Trade Contractor shall perform all necessary land surveys to complete the work required by this Agreement. The Trade Contractor shall provide detailed construction staking.

B. At the beginning of the construction or as the work progresses, the Trade Contractor shall be responsible for the installation of property corners and the setting of benchmarks.

C. Benchmarks and survey stakes shall be preserved by the Trade Contractor and in case of their destruction, or removal by him, his employees, or others, they shall be replaced at the Trade Contractor's expense and his Sureties shall be liable therefor.

D. The Trade Contractor shall be responsible for elevations used in computing his bid.

E. The Trade Contractor shall secure and pay for all necessary permits, fees and licenses in connection with the performance of its work and shall pay all municipal and other governmental fees in connection therewith except those expressly provided by the specifications as being the responsibility of the Owner, and shall furnish at its expense any and all bonds and cash or other deposits required by law or required by any lawful body having the right to make demand therefor.

F. The Owner will provide rights-of-way and permanent and temporary easements as shown on the plans for construction purposes. Any additional land actually needed by the Trade Contractor for the performance of the work, proper location of his plant and equipment, or the storage of materials and supplies for the work, shall be furnished by the Trade Contractor.

Section 8. Protection of Work, Property and Persons.

A. The Trade Contractor shall be responsible for initiating and maintaining all safety precautions and programs in connection with the work. Neither the Owner nor the Engineer will be responsible for Trade Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto. The Trade Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees on the work who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

B. The Trade Contractor shall at all times consult with and obtain the approval of the Owner for the storage of material, operation of equipment, placing of temporary structures or dispositions of any surplus or waste materials upon property of the Owner anywhere outside the limits of construction. The Trade Contractor shall comply with all state, federal and local laws related to the storage or placement of any supplies, equipment, structures, or any other materials.

C. The Trade Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall notify owners of adjacent utilities when prosecution of the work may affect them. The Trade Contractor shall remedy at his expense all damage, injury, or loss to any property or person caused, directly or indirectly, in whole or in part, by the Trade Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the contract documents or to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Trade Contractor. Notwithstanding the provisions of C.R.S. § 13-20-802.5(2), for purposes of this Contract, the measure of damages shall never be deemed to be the fair market value of the real property without an alleged construction defect.

D. The Trade Contractor shall observe all rules and regulations of the health department

having jurisdiction and shall take precautions to avoid creating unsanitary conditions.

E. In emergencies affecting the safety of persons or the work or property at the site or adjacent thereto, the Trade Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss.

F. The Trade Contractor shall at all times conduct and work in such a manner as to cause the least inconvenience and greatest protection to the general public. The Trade Contractor shall furnish and maintain barricades, warning signs, red flags, lights, and temporary passageways as may be necessary to protect the work and to safeguard the public. The cost of furnishing and maintaining the above facilities shall be incidental to the contract and no extra compensation for it will be allowed.

G. Throughout the performance of the work or in connection with this Contract, the Trade Contractor shall construct and adequately maintain suitable and safe crossings over trenches and such detours as are necessary to care for public and private traffic. The material excavated from trenches shall be compactly deposited along the sides of the trench or elsewhere in such a manner as shall give as little inconvenience as possible to the traveling public, to adjoining property owners, to other trade contractors, or to the City.

H. In performing the work, the Trade Contractor shall take the necessary action, including making arrangements with the owners or operators of existing power, cable and telephone lines, fiber-optic and telemetry lines, gas, water, sewer and other utilities or installations that may be encountered, whether privately or publicly owned, to prevent interference with the conditions, operations and maintenance of the respective utilities in a manner satisfactory to the owners, or operators of the respective utilities. Relocation or repair of utilities encountered even though not shown on the plans, shall be the responsibility of the Trade Contractor. The cost of the above measures, including maintaining of guards, watchmen, signals, barricades and temporary structures, making any necessary repairs and other cooperative or corrective work shall be borne by the Trade Contractor and shall be included in the prices bid in the Proposal for the related items of work. Neither the Owner nor the Engineer shall be responsible to the Contractor for the existence of utilities not shown on the plans or drawings and the Trade Contractor remains obligated under this paragraph for all hidden utilities.

I. The Trade Contractor shall be responsible for the preservation of all private or public property along and adjacent to the work and shall take all necessary precautions to prevent damage or injury thereto. Such preservation and protection shall include but not be limited to, trees, stone walls, fences, mailboxes, monuments, irrigation ditches, driveways, road access culverts, underground pipelines and structures. Such preservation and protection shall apply to all underground pipelines and utilities whether public, private or individually owned that are in or adjacent to the right-of-way. When direct or indirect damage is done to public or private property on account of the act, omission, neglect or misconduct in the prosecution or non-prosecution of the work on the part of the Trade Contractor, such property shall be restored by the Trade Contractor at the Trade Contractor's expense to a condition similar or equivalent to that which existed before such damage or injury was done, and brought up to current codes if applicable. The Trade Contractor shall be responsible for making all arrangements at his own expense for moving and operating equipment at temporary crossings of telephone and transmission lines, railroad tracks, irrigation ditches and pipelines.

Section 9. Communication with the Owner.

The Trade Contractor shall designate a responsible member of its organization at the site, whose duty shall be designated as the contact person for all communication between the Owner and the Trade Contractor. Said designated representative shall also be responsible to attend such meetings, as may be required to insure coordination and adequate performance of the work.

Section 10. Scope of Work.

The scope of work is described in the contract documents which are appended hereto and incorporated herein by this reference.

Section 11. Trade Contractor's Responsibility.

A. The Trade Contractor shall be responsible for all the work under this Contract until completion and final acceptance by the Owner.

B. The Trade Contractor shall supervise and direct the work. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.

C. The Trade Contractor shall employ on the work only such persons who are competent and skilled in their assignments. Any employee who obstructs the progress of the work through incompetence or other means or conducts himself improperly shall be discharged or removed from the work when so requested by the Owner. This section shall not create a duty for the Owner to evaluate or assess the competence or skills of the Trade Contractors employees.

D. The Trade Contractor warrants that all materials and equipment furnished and incorporated by him in the project shall be new, unless otherwise specified, and that all work under this Trade Contract shall be of good quality, free from fault and defects and in conformity with the contract documents. All work not conforming to these standards shall be considered defective. The warranty provided herein shall be in addition to and not in limitation of any other warranty or remedy required by law or by the contract documents.

E. The Trade Contractor agrees that if he should fail or neglect to prosecute the work diligently and properly, or fail to perform any provisions of this Trade Contract, that the Owner, after three (3) days written notice to said Trade Contractor may, without prejudice to any other remedy, make good such deficiencies and may deduct the cost thereof from the payments then or thereafter due to the Trade Contractor pursuant to this Contract.

F. Tools furnished with any equipment may be used when approved by the Owner and shall be turned over to the Owner after completion of the work in a condition acceptable to the Owner. In case of rejection by the Owner, the Trade Contractor shall replace the tool or tools at no extra cost to the Owner.

G. Upon completion and before final acceptance of the work, the Trade Contractor shall remove from the site of the work and property of the Owner, all machinery, equipment, surplus materials, rubbish, barricades, signs and temporary structures and shall leave the premises in a condition which is satisfactory to the Owner.

H. The Trade Contractor shall keep one record set of the contract documents annotated to show all changes made during construction.

I. The Trade Contractor shall be responsible for the acts and omissions of all his employees and all subcontractors, their agents and employees and all other persons performing any of the work under a contract with the Trade Contractor.

J. Upon completion of the work, the Trade Contractor shall, at his or its expense, remove from the vicinity of the work, all plant, buildings, rubbish, unused materials, concrete forms and other like material, belonging to him or used under his direction during construction, and in the event of his failure to do so, the same may be removed by the Owner and the Trade Contractor, his Surety or Sureties, shall be liable for the cost thereof. Also during the construction of the work, the site, partially

finished structures, and material stockpiles shall be kept in a reasonable state of order and cleanliness.

Section 12. Changes in the Work.

A. CHANGES. Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, only by Change Order, Construction Change Directive, or Order for a Minor Change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

1. A Change Order shall be based upon agreement among the Owner, Contractor, and Engineer; a Construction Change Directive requires agreement by the Owner and Engineer and may or may not be agreed to by the Contractor; an Order for a Minor Change in the Work may be issued by the Engineer alone.

2. Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive, or Order for a Minor Change in the Work.

3. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to the quantities of work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted; provided however, that Owner may increase the number of units without change in the unit price if reasonable.

B. CHANGE ORDERS. The Contract Sum and the Contract Time may be changed only by Change Order. Methods used in determining adjustments to the Contract Sum may include those listed in Subsection C below. A Change Order is a written order to the Contractor, signed by the Contractor, the Owner and the Engineer, stating their agreement upon all of the following:

1. A change in the Work;
2. The amount of the adjustment in the Contract Sum, if any; and
3. The extent of the adjustment in the Contract Time, if any.

C. CONSTRUCTION CHANGE DIRECTIVES. A Construction Change Directive is a written order directed to the Contractor and signed by the Owner and Engineer, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

1. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

2. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- a. By mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- b. By unit prices stated in the Contract Documents or subsequently agreed upon;

- c. By cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- d. By the method provided in Subparagraph (C)(3)(5).

3. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the work involved and advise the Engineer and Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

4. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

5. If the Contractor does not respond promptly to the Construction Change Directive or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Engineer on the basis of reasonable expenditures and savings of those performing the work attributable to the change, including, in case of an increase in the Contract Sum, a percentage fee for overhead and profit not to exceed five percent (5%) of such work's actual cost for Contractor and ten percent (10%) of such work's actual cost to be apportioned between any and all subcontractors and sub-subcontractors. For work performed by Contractor's own forces, Contractor's mark-up shall be limited to actual cost plus a percentage fee for overhead and profit not to exceed ten percent (10%). In such case, the Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting of actual costs together with appropriate supporting data. For the purposes of this Subparagraph, actual costs shall be defined as and limited to the following:

- a. Costs of labor, including Social Security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- b. Costs of materials, supplies, and equipment, including costs of transportation, whether incorporated or consumed;
- c. Reasonable rental costs of machinery and equipment, exclusive of hand tools, obtained and used specifically for such work, whether rented from the Contractor or others; and
- d. Costs of premiums for all bonds (if any), permit fees, and sales, use or similar taxes directly attributable to such work. Actual cost does not include any item which could be deemed to be a general conditions cost or overhead, such as but not limited to, the cost of Contractor and Subcontractor supervisory personnel assigned to the Work, and field office and related expenses.

6. Pending final determination of actual cost to the Owner, amounts not in dispute may be included in applications for payment. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Engineer. When both additions and credits covering related work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7. If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be determined in accordance with Article 5 hereof.

8. When the adjustments in the Contract Sum and Contract Time are determined as provided herein, such determination shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

D. MINOR CHANGES IN THE WORK

1. The Engineer will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be affected by written order, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

2. The Owner may at any time as the need arises, order changes within the scope of work without invalidating the Agreement. If such changes increase or decrease the amount due under the contract documents or in the time required for performance of the work, and equitable adjustment will be authorized by change order.

3. The Owner also may, at any time, by issuing a field order, make changes in the details of the work. The Trade Contractor shall proceed with the performance of any changes in the work so ordered by the Owner unless the Trade Contractor believes that such field order entitles him to a change in contract price or time, or both, in which event he shall give the Owner written notice thereof within ten (10) days after the receipt of the ordered change, and the Trade Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the Owner.

Section 14. Contract Documents.

In case of conflict between this Contract, the general conditions of the contract for construction, and the supplementary conditions, this Contract will govern.

ARTICLE 4 – TRADE CONTRACTOR'S CONSTRUCTION SCHEDULE

Section 1. Preconstruction Conference.

A preconstruction conference shall be scheduled at the time the Notice of Award is issued. The Trade Contractor, at the preconstruction conference, shall prepare and submit for the Owner's and the Engineer's review and approval a Trade Contractor's construction schedule for the Work, in such and form and detail as the Owner may require. The schedule shall not exceed time limits under the Contract Documents, shall be revised as required herein and at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire project to the extent required by the Contract Documents, and shall provide for the expeditious and practicable execution of the Work. The schedule shall indicate the proposed starting and completion dates for the various subdivisions of the Work as well as the totality of the Work. The schedule shall be updated every fourteen (14) days for submitted to Engineer with Trade Contractor's applications for payment. Each schedule shall contain a comparison of actual progress with the estimated progress for such time stated in the original schedule. If any schedule submitted sets forth a date for Substantial Completion for the Work or any phase of the Work beyond the date(s) of Substantial Completion established in the Contract (as the same may be extended as provided in the Contract Documents), the Trade Contractor shall submit to Engineer and Owner for their review and approval, a narrative description of the means and methods which Trade Contractor intends to employ to expedite the progress of the Work to ensure timely completion of the various phases of the Work as well as the totality of the

Work. To ensure such timely completion, Trade Contractor shall take all necessary action including, without limitation, increasing the number of personnel and labor on the Project and implementing overtime and double shifts. In that event, Trade Contractor shall not be entitled to an adjustment in the Contract Sum or the Schedule.

Section 2. Schedule of Submittals.

The Contractor shall prepare and keep current, for the Engineer's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Engineer reasonable time to review submittals.

Section 3. Conformance to Schedule.

The Contractor shall conform to the most recent schedules.

ARTICLE 5 - TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. The date of beginning and the time for completion of the work are essential conditions of the contract documents and the work embraced shall be commenced on a date specified in the notice to proceed.

B. The Trade Contractor shall proceed with the work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Trade Contractor and the Owner, that the contract time for the completion of the work described herein is a reasonable time, If Trade Contractor is delayed in the progress of the Work by fire, unusual delay in transportation, unanticipated adverse weather conditions, or other unavoidable casualties beyond Trade Contractor's control other than unanticipated adverse weather conditions, the Contract Time shall be extended for a reasonable period of time. "Weather" means precipitation, temperature, or wind, and an "adverse weather condition" means weather that on any calendar day varies from the average weather conditions for that day by more one hundred percent (100%) as measured by the National Oceanic and Atmospheric Administration. The term "unanticipated adverse weather conditions" means the number of days in excess of the anticipated adverse weather days per month as set forth below:

MONTHLY ANTICIPATED ADVERSE WEATHER DAYS											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7	4	4	4	6	3	4	2	3	3	2	5

By reason of example only, if in March there are two (2) days when the snowfall exceeds the average snowfall for that day by one hundred percent (100%), those two (2) days will have experienced an adverse weather condition. However, there will have been no unanticipated adverse weather condition in March, because there are four (4) anticipated adverse weather days in March, which should be accounted for in the schedule. If, however, there are five (5) days in which the snowfall exceeds the average snowfall by one hundred percent (100%), an unanticipated adverse weather condition will have occurred, and Trade Contractor shall be entitled to request an extension of time.

C. If the Trade Contractor shall fail to complete the work within the Contract Time, or extension of time granted by the Owner, then the Trade Contractor shall pay to the Owner the amount of liquidated damages and not as penalty the sum of (\$) for each calendar day that the Trade Contractor shall be in default after the time stipulated in the contract documents.

D. The Owner will charge the Trade Contractor, and may deduct from the partial and final payment for the work, all architectural, engineering and construction management expenses incurred by the Owner in connection with any work accomplished after the specified completion date.

E. The Trade Contractor will not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the Trade Contractor has promptly given written notice of such delay to the Owner.

1. To any preference, priority or allocation order duly issued by the Owner.
2. To unforeseeable causes beyond the control and without the fault or negligence of the Trade Contractor, including, but not restricted to, unforeseen conditions, acts of God, or of the public enemy, acts of the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and
3. To any delays of subcontractors occasioned by any of the causes specified in subparagraphs 1 and 2 of this paragraph E.

F. The Trade Contractor waives any right of recovery or reimbursement or by whatever name, as against the Owner or the Engineer, as a result of any delay or increase on overhead cost incurred by the Trade Contractor's association with any action or inaction on the part of any other trade contractor or supplier.

G. Any request for extension of the Contract Time shall be made in writing to the Project Manager not more than seven (7) days after commencement of the delay; otherwise it shall be waived. Any such request shall contain an estimate of the probable effect of such delay on the progress of the Work.

H. In strict accordance with C.R.S. § 24-91-103.5, the City shall not amend the Contract Price to provide for additional compensation for any delays in performance which are not the result of acts or omissions of the City or persons acting on behalf of the City.

ARTICLE 6 - CONTRACT SUM

Section 1. Monthly or Progress Payments.

A. The City Council of the City of Northglenn has appropriated the money necessary to fund this project. The Owner shall pay the Trade Contractor in current funds for the performance of the work, subject to any additions and deletions, by written change order, the total sum not to exceed (\$) (the "Original Contract Amount"). Notwithstanding anything to the contrary contained in this Agreement, no change order or other form of directive by the Owner requiring additional compensable work to be performed, which causes the aggregate amount payable under this Agreement, to exceed the amount appropriated for the Original Contract Amount, unless the Trade Contractor is given written assurance by the City of Northglenn that lawful appropriations have been made by the City Council of the City of Northglenn to cover the cost of the additional work.

B. The Engineer has, by separate agreement with the Owner, agreed to include in its monthly work estimate to the Owner, a review of the Trade Contractor's estimates of the value of all work, labor, and materials of the Trade Contractor incorporated into the Project. The Trade Contractor hereby agrees that estimates provided to the Engineer for review for the Owner shall be for work actually performed upon the project and that all such work, including labor and materials, have been paid. The determination of the amount of work completed on each application for payment by the Trade Contractor shall be made by the Engineer and shall thereafter be subject to approval by the Owner. Such determination, however, by the Engineer or approval by the Owner shall not be construed as acceptance of the work.

1. Before the first application for payment, the Trade Contractor shall submit to the Engineer and Owner a schedule of values to be allocated to the various portions of the Work, which in the aggregate equals the total Contract Sum, divided so as to facilitate

payments to subcontractors, supported by such evidence of correctness as the Engineer may direct. This schedule, when approved by the Engineer, shall be used to monitor the progress of the Work and as a basis for making progress payments hereunder. Application for monthly progress payments shall be made in writing in accordance with this Contract and shall be submitted on approved forms provided by the Owner and shall be submitted to the Owner on or before the twentieth (20th) day of each month. Applications received on time will be paid on the twentieth (20th) day of the following month, providing that the Owner approves such recommendations of the Engineer. Applications received after the twentieth (20th) day of each month shall be paid after the Owner's next pay period.

2. Pursuant to Colo. Rev. Stat. § 24-91-103, as may be amended, where the Original Contract Amount exceeds one hundred fifty thousand dollars (\$150,000.00), the Owner may retain up to five percent (5%) of the calculated value of completed work from each progress payment up until the contract is completed satisfactorily and finally accepted by the Owner. If the Owner finds satisfactory progress is being made in any phase of the contract, the Trade Contractor may make written request of the Owner for final payment of the withheld percentage. The Owner may agree to final payment of the withheld percentage if the Owner finds satisfactory and substantial reasons exist for the payment. The Trade Contractor must provide written approval to the Owner from any surety furnishing bonds for the contract work in order to receive said payment of the withheld percentage.

3. Upon receipt of written notice from the Trade Contractor that his work is ready for final inspection and acceptance by the Owner and upon receipt of final application for payment, the Owner will promptly make such final field review subject to the final payment requirements contained in Colo. Rev. Stat. § 38-26-107, as amended. If the Owner finds that the work is acceptable under the contract documents, he will recommend to the Owner that a final certificate of payment be issued. Neither final payment nor the remaining retention shall become due until the Trade Contractor submits to the Engineer an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work, have been paid or otherwise satisfied. Likewise, final payment shall not be made until the consent of the surety to final payment has been obtained, and if required by the Owner, such other data establishing payment or satisfaction of all obligations, including releases, final lien waivers, and receipts and warranties, if any, have been provided to the Engineer for the use and benefit of the Owner. Should any subcontractor of the Trade Contractor or supplier of said Trade Contractor refuse to furnish any warranty and/or release or waiver, the Owner in its sole discretion, may refuse to certify final payment. The Trade Contractor may then furnish sufficient bonds satisfactory to the Owner to indemnify the Owner against any such liens.

4. Notwithstanding anything else to the contrary contained herein, such final payment by the Owner shall not be construed as a waiver of any claims affecting or arising from:

- a. Unsettled liens;
- b. Faulty or defective work appearing after substantial completion;
- c. Failure of the work to comply with the requirements of the contract documents;
- d. Terms of any special warranties required by the contract documents.

5. The acceptance by the Trade Contractor of final payment shall be and shall operate as a release to the Owner from all claims and all liability to the Trade Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of the work other than claims in stated amounts as may be specifically expected by the Trade Contractor with the consent of the Owner. Any

payment, however, final or otherwise, will not release the Trade Contractor or his sureties from any obligations under the contract documents or the performance bond and labor and material payment bond.

ARTICLE 7 - CORRECTION OF WORK

A. During the life of the Contract and for a period of two (2) years after final acceptance, the Trade Contractor shall promptly remove from the premises all work rejected by the Owner for failure to comply with the contract documents, whether incorporated in the construction or not, and the Trade Contractor shall promptly replace and re-execute the work in accordance with the contract documents and without expense to the Owner and shall bear the expense of making good all work of other trade contractors destroyed or damaged by such removal or replacement. The Owner, however, may at its discretion elect to accept an equitable reduction in price or a refund instead of correction of the condemned work.

B. All removal and replacement work shall be done at the Trade Contractor's expense. If the Trade Contractor does not take action to remove such rejected work within ten (10) days after receipt of written notice, the Owner may remove such work and store the materials all at the expense of the Trade Contractor.

ARTICLE 8 - TEMPORARY FACILITIES AND SERVICES

Unless otherwise provided in this Contract, the Trade Contractor shall furnish and make available, at no cost, all temporary facilities, including all power needed for heating and protection of facilities and work. It is the expressed intent of the parties that the Trade Contractor shall be responsible for and at its sole cost all heating and protection of facilities and work.

ARTICLE 9 - INDEMNIFICATION AND INSURANCE

Section 1. Indemnification.

The Contractor, to the fullest extent permitted by law, shall defend, indemnify and hold harmless the City, its officers, employees, agents and their insurers, from and against all liability, claims and demands on account of injury, loss or damage, including without limitation, claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage or any other loss of any kind whatsoever, which arises out of or is in any manner connected with this Contract, to the extent that such injury, loss or damage is attributable to the act, omission, error, professional error, mistake, negligence or other fault of the Contractor, the Contractor's employees, subcontractors or anyone else employed directly or indirectly by the Contractor, Contractor's employees or subcontractor.

The Contractor, to the fullest extent permitted by law, shall defend, investigate, handle, respond and provide defense for and defend against any such liability, claims or demands at the sole expense of the Contractor, or at the option of the City, Contractor agrees to pay the City or reimburse the City for defense costs incurred by the City in connection with any such liability, claims, or demands. The Contractor, to the fullest extent permitted by law, shall defend and bear all other costs and expenses related thereto, including court costs and attorney fees, whether or not such liability, claims or demands alleged are groundless, false or fraudulent.

This indemnification provision is intended to comply with C.R.S. § 13-21-111.5(6), as amended, and shall be read as broadly as permitted to satisfy that intent.

Section 2. Insurance.

A. The Contractor agrees to obtain and maintain during the life of this Contract, a policy

or policies of insurance against all liability, claims, demands and other obligations assumed by the Contractor pursuant to Section 1 above. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to Section 1 above, by reason of its failure to obtain and maintain during the life of this Contract insurance in sufficient amounts, durations, or types.

B. Contractor shall obtain and maintain during the life of this Contract, and shall cause any subcontractor to obtain and maintain during the life of this Contract, the minimum insurance coverages listed below. Such coverages shall be obtained and maintained with forms and insurers acceptable to the City. All coverages shall be continuously maintained to cover all liability, claims, demands and other obligations assumed by the Contractor pursuant to Section 1 above. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.

1. Worker's Compensation Insurance to cover obligations imposed by applicable law for any employee engaged in the performance of the work under this Contract, and Employers Liability Insurance with minimum limits of five hundred thousand dollars (\$500,000) each incident, five hundred thousand dollars (\$500,000) disease—policy limit, and five hundred thousand dollars (\$500,000) disease—each employee.

2. General Public Liability Insurance to be written with a limit of liability of not less than one million dollars (\$1,000,000) for all damages arising out of bodily injury, personal injury (including coverage for employee and contractual acts), including death, at any time resulting therefrom, sustained by any one person and not less than two million dollars (\$2,000,000) for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by two or more persons in any one accident. This policy shall also include coverage for blanket contractual and independent contractor risks. The limits of General Public Liability Insurance for broad form property damage (including products and completed operations) shall be not less than one million dollars (\$1,000,000) for all damages arising out of injury to or destruction of property in any one (1) accident and not less than two million dollars (\$2,000,000) for all damages arising out of injury to, or destruction of property, including the City's property, during the policy period. The General Public Liability Insurance policy shall include coverage for explosion, collapse and underground hazards. The policy shall contain a severability of interests provision.

3. Protective Liability and Property Damage insurance covering the liability of the Owner, including any employee, officer or agent of the Owner with respect to all operations under the Contract by the Trade Contractor or his sub-contractors shall be obtained and maintained during the life of the contract. The limits of the Owner's Protective Liability Policy, to be provided by the Trade Contractor, as described in this Section 2, shall be increased to the same limits as described above for the Trade Contractor's General Public Liability Insurance.

4. Comprehensive Automobile Liability Insurance with minimum combined single limits for bodily injury and property damage of not less than one million dollars (\$1,000,000) each occurrence and one million dollars (\$1,000,000) aggregate with respect to each of the Trade Contractor's owned, hired, and non-owned vehicles assigned to or used in performance of the services. The policy shall contain a severability of interests provision. If the Trade Contractor has no owned automobiles, the requirements of this paragraph shall be met by each employee of the Trade Contractor providing services to the Owner under this contract.

C. To the extent that liability results from the acts or omissions of the Trade Contractor, all Insurance Policies and Certificates of Insurance issued for this project shall name as additional

insured(s), the Owner, whether private or governmental, the Owner's officers and employees, and the Engineer and its agents and employees, and any other person(s), company(ies), or entity(ies) deemed necessary by the Owner. The Trade Contractor shall be solely responsible for any deductible losses under any policy required herein.

D. The insurance provided by the Trade Contractor shall be primary to insurance carried by the Owner, the Engineer, and all other additional insureds, and the principal defense of any claims resulting from the Trade Contractor's obligations under the Contract shall rest with the Trade Contractor's Insurer.

Section 3. Certificates of Insurance.

A. The certificate of insurance provided by the Trade Contractor shall be completed by the Trade Contractor's insurance agent as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be reviewed and approved by the Owner prior to commencement of the contract. No other form of certificate shall be used. The certificate shall identify this Contract and shall provide that the coverages afforded under the policies shall not be cancelled, terminated or materially changed until at least thirty (30) days prior written notice has been given to the Owner. The completed certificate of insurance shall be sent to:

City of Northglenn
Att: Kathy Kvasnicka
11701 Community Center Drive
Northglenn, Colorado 80233-8061

B. Failure on the part of the Trade Contractor to procure or maintain policies providing the required coverages, conditions, and minimum limits shall constitute a material breach of contract upon which the Owner may immediately terminate this contract, or at its discretion the Owner may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the Owner shall be repaid by the Trade Contractor to the Owner upon demand, or the Owner may offset the cost of the premiums against any monies due to the Trade Contractor from the Owner.

C. The Owner reserves the right to request and receive a certified copy of any policy and any endorsement thereto.

D. The parties hereto understand and agree that the Owner is relying on, and does not waive or intend to waive by any provision of this contract, the monetary limitations (presently three hundred fifty thousand dollars (\$350,000) per person and nine hundred ninety thousand dollars (\$990,000) per occurrence) or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, 24-10-114 et seq. C.R.S., as from time to time amended, or otherwise available to the Owner, its officers or employees.

ARTICLE 10 - PERFORMANCE, LABOR AND MATERIAL PAYMENT BONDS

The Trade Contractor shall within ten (10) days after the receipt of a notice of award, furnish the Owner with a performance bond and a payment bond in penal sums equal to the amount of the contract price, conditioned upon the performance by the Trade Contractor of all undertakings, covenants, terms, conditions and agreements of the contract documents, and upon the prompt payment by the Trade Contractor to all persons supplying labor and materials in the prosecution of the work provided by the contract documents. Such bonds shall be executed by the Trade Contractor and a corporate bonding company licensed to transact such business in the state in which the work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the Trade Contractor. If at any time a surety on any such bond is declared a

bankrupt or loses its right to do business in the state in which the work is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, the Trade Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Trade Contractor. No further payments will be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Owner.

ARTICLE 11 – CLAIMS AND DISPUTES

A. Definition. A claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment of contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract. The term “claim” also includes other disputes between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate claims shall rest with the party making the claim.

B. Decision of Engineer or Architect. Claims may, upon request of both the Contractor and the Owner, be referred initially to the Engineer or Architect for action as provided in Article 3, Section 12.

C. Time limits on Claims. Claims by either party must be made within twenty one (21) days after occurrence of the event giving rise to such claim or within twenty one (21) days after the claimant first recognizes, or reasonably should have recognized, the condition giving rise to the claim, whichever is later. An additional claim made after the initial claim has been implemented by change order will not be considered unless submitted in a timely manner.

D. Continuing Contract Performance. Pending final resolution of a claim, including litigation, unless otherwise directed by Owner in writing, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

E. Waiver of Claims: Final Payment. The making of Final Payment shall constitute a waiver of claims by the Owner except those arising from:

1. Liens, claims, security interests, or encumbrances arising out of the Contract and unsettled;
2. Failure of the Work to comply with the requirements of the Contract Documents;
3. Terms of special warranties required by the Contract Documents; or
4. Faulty or defective work appearing after Substantial Completion.

F. Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than seven (7) days after first observance of the conditions. Site conditions which an experienced and prudent contractor could have anticipated by visiting the site, familiarizing himself with the local conditions under which the Work is to be performed and correlating his observations with the requirements of the Contract Documents shall not be considered as claims for concealed or unknown conditions, nor shall the locations of utilities which differ from locations provided by the

utility companies. The Engineer or Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or the required time for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Engineer or Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Engineer or Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within twenty-one (21) days after the Engineer or Architect has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Engineer or Architect for initial determination, subject to further proceeding pursuant to these Contract Documents.

G. Claims for Additional Cost. If the Contractor wishes to make claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the work. Said notice shall itemize all claims and shall contain sufficient detail and substantiating data to permit evaluation of same by Owner and Engineer or Architect. No such claim shall be valid unless so made. Prior notice is not required for claims relating to an emergency endangering life or property. If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Engineer or Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Engineer or Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension, or (7) other reasonable grounds, claim shall be filed in accordance with the procedure established herein Any change in the Contract Sum resulting from such claim shall be authorized by change order or construction change directive.

H. Claims for additional time. If the Contractor wishes to make claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one claim is necessary.

I. Injury or damage to person or property. Subject to the Parties' obligations and responsibilities under the Contract Documents in general and Article 8 hereof in particular, if either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a claim for additional cost or time related to this claim is to be asserted, it shall be filed as provided in Article 3, Section 12.

ARTICLE 12 - RESOLUTION OF CLAIMS AND DISPUTES

A. The Engineer (if the matter is referred to the Engineer for initial decision) will review claims and take one or more of the following preliminary actions within ten (10) days of receipt of a claim: (1) request additional supporting data from the claimant; (2) submit a schedule to the parties indicating when the Engineer expects to take action; (3) reject the claim in whole or in part, stating the reasons for rejection; (4) recommend approval of the claim by the other party; or (5) suggest a compromise. The Engineer may also, but is not obligated to, notify the surety, if any, of the nature and amount of the claim.

B. If a claim has been resolved, the Engineer (or at the Owner's option, Owner), will prepare or obtain appropriate documentation.

C. If a claim has not been resolved, the party making the claim shall within ten (10) days after the Engineer's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested by the Engineer; (2) modify the initial claim; or (3) notify the

Engineer that the initial claim stands.

D. If a claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Engineer, the Engineer will notify the parties in writing that the Engineer's decision will be made within seven (7) days, which decision will be considered advisory only and not binding on the parties in the event of litigation in respect of the claim. Upon expiration of such time period, the Engineer will render to the parties the Engineer's written decision relative to the claim, including any change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Trade Contractor's default, the Engineer may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

E. The dispute clause does not preclude the considerations of questions of fact or law in connection with decisions provided for in Paragraph A above. Nothing in this Agreement, however, shall be construed as making final a decision of an administrative official, representative or City Council on a question of fact or law.

F. As between the parties of this Agreement, as to all acts or failure to act by either party of this Agreement, any applicable statute of limitation shall commence to run from the date of the agreed party's discovery of such act or failure to act.

G. The Trade Contractor shall give written notice to the Owner within ten (10) days of any dispute/claim arising under this Contract upon which the Trade Contractor seeks compensation or change of contract documents, otherwise the Trade Contractor's dispute/claim shall be deemed waived. Said ten (10) days written notice shall not be deemed to run from the date of discovery in this instance but from the date the dispute/claim has arisen.

ARTICLE 13- TERMINATION

A. This Agreement may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this Agreement through no fault of the terminating party; provided that no such termination may be effected unless the other party is given (1) not less than ten (10) days written notice (delivered by certified mail, return receipt requested) of intent to terminate; and (2) an opportunity for consultation with the terminating party prior to termination.

B. This Agreement may be suspended or terminated in whole or in part, in writing, by the Owner for its convenience; provided that no such termination may be effected unless the Trade Contractor is given (1) not less than ten (10) days written notice (delivered by certified mail, return receipt requested) of intent to suspend or terminate; and (2) an opportunity for consultation with the Owner prior to suspension or termination.

C. Suspension for Convenience: The Owner, for its own convenience, may suspend the contract in whole or in part at any time by written notice to the Trade Contractor. Such notice shall state the extent and the effective date of such suspension, and on the effective date thereof the Trade Contractor shall promptly suspend such work to the extent specified, and during the period of such suspension shall properly care for and protect all work and materials, housing and equipment on hand for construction under the contract. The Trade Contractor also shall promptly supply the Owner with copies of all outstanding orders for materials, equipment and services, and shall take such action relative to such orders as may be directed by the Owner. If the performance of the work is thus suspended, the Trade Contractor shall be entitled to be reimbursed for all additional expense incurred by reason of such suspension as agreed upon by the Trade Contractor and the Owner.

D. Termination for Convenience:

1. The Owner may for its own convenience terminate work under the contract in whole or in part at any time by written notice to the Trade Contractor. Such notice shall state the extent and effective date of such termination and on the effective date thereof, the Trade Contractor will, and as to the extent directed, stop work under the contract and the placement of further orders of subcontracts under the contract, terminate work under order and subcontracts under the contract, and take any necessary action to protect property in the Trade Contractor's possession in which the Owner has or may acquire an interest.

2. In the event of such termination, the Owner shall pay to the Trade Contractor: (1) its direct costs (excluding overhead) for all work done in conformity with the Contract to the effective date of such termination and (2) other costs pertaining to the work which the Trade Contractor may incur as a result of such termination, all as approved by the Owner plus ten percent (10%) of such costs (excluding costs under (2) above) for overhead and profit, provided, however, that in no event shall the total amount to be paid under this Article 11, Section D.(2) plus payments previously made, exceed the lesser of (a) the total aggregate contract price specified in the Trade Contract; or (b) that proportion of the aggregate total contract price specified in the date of termination bears to the entire work to be performed hereunder. Any payment under this Article 11, Section D.(2) shall be made upon the expiration of the period within which liens may be filed under the laws of the state of Colorado, subject, however, to withholding by the Owner for the reasons and in the manner provided in those provisions pertaining to withholding of payments for liens.

E. Termination for Default:

1. The Owner shall have the right to terminate the employment of the Trade Contractor after giving ten (10) days written notice of the termination to the Trade Contractor in the event of any default by the Trade Contractor. In the event of such termination, the Owner may take possession of the work and of all materials, tools and equipment thereon and may finish the work by whatever method and means he may select. It shall be considered a default by the Trade Contractor whenever he shall:

- a. Disregard or violate important provisions of the contract documents or the Owner's instructions, or fail to prosecute the work according to the agreement schedule of completion, including extensions thereof;
- b. Fail to provide a qualified representative, competent workmen or subcontractors, or proper materials, or fail to make prompt payment therefor; and
- c. Fail to submit a completion schedule within fourteen (14) days after award of contract.

2. Upon termination of the contract by the Owner for default by the Trade Contractor, no further payments shall be due to the Trade Contractor until the work is completed. If the unpaid balance of the contract amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the Trade Contractor. If the cost of completing the work shall exceed the unpaid balance, the Trade Contractor shall pay the difference to the Owner. The amount of the cost incurred by the Owner in implementing the work, and the damage incurred through the Trade Contractor's default, shall be approved by the Owner.

3. The provisions of this Article 11, Section D.(2) shall not apply in the event of default of the Trade Contractor; provided, however, that the provisions of Article 11, Section D.(2) shall apply in the event of substantial failure by the Owner to fulfill its obligations under this Agreement.

ARTICLE 14 - SIMULTANEOUS WORK BY OTHERS

A. The Owner reserves the right to let other contracts in connection with this project. The Trade Contractor shall afford other trade contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

B. If the proper execution or results of any part of the Trade Contractor's work depends upon the work of any other trade contractor, the Trade Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. Failure of the Trade Contractor to so inspect and report defects shall constitute an acceptance of the other trade contractors' work as fit and proper for the addition of his work thereto, except as to defects which may develop in the other trade contractors' work after the execution of his work.

C. The Trade Contractor shall coordinate his operations with those of other trade contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work.

D. The Trade Contractor, including his subcontractors, shall keep informed of the progress and the detail work of other trade contractors and shall notify the Engineer immediately of lack of progress, defective workmanship, or lack of coordination on the part of other trade contractors. Failure of the Trade Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress, defective workmanship, or lack of coordination by others shall be construed as acceptance by him of the work and the status of work as being satisfactory for proper execution of his own work.

E. All materials and labor shall be furnished at such times as shall be for the best interest of all trade contractors concerned, to the end that the combined work of all may be properly and fully completed on contract time.

F. Nothing herein shall be construed in any way as giving the Trade Contractor a claim as against the Owner and the Engineer resulting in any revised schedule based upon delay caused by any other trade contractor or supplier.

ARTICLE 15 - SUBCONTRACTING

A. The Trade Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

B. Before execution of the contract, the Trade Contractor shall submit the names of all subcontractors, including contact persons, phone numbers, and addresses to the Engineer or Architect and Owner. The Trade Contractor shall also promptly notify all parties of any changes in subcontractors or subcontractor contact information.

C. The Trade Contractor shall be fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

D. The Trade Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Trade Contractor by the terms of the contract documents insofar as applicable to the work of subcontractors and to give the Trade Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Trade Contractor under any provision of the contract documents.

E. Nothing contained in this Contract will create any contractual relation between any subcontractor and the Owner.

ARTICLE 16 - GUARANTY

A. The Trade Contractor shall guarantee all materials and equipment furnished and work performed for a period of two (2) years from the date of final acceptance of the contract by the Owner that the work is free from all defects due to faulty materials or workmanship and that the Trade Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Trade Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Owner may do so and charge the Trade Contractor the cost thereby incurred. The performance bond shall remain in full force and effect through the guarantee period.

B. Whenever in the specifications a guarantee or maintenance bond is required to be furnished for any item of equipment, material or portion of the work, such guarantee shall be submitted to the Owner and a written approval will be issued to the Trade Contractor before any such equipment, material or construction is ordered and incorporated in work by the Trade Contractor.

ARTICLE 17 - SALES TAX

The Trade Contractor and all of his subcontractors must make application to the Colorado State Department of Revenue for a certificate of exemption to permit the purchase of building materials for the construction of this project without payment of the sales tax. Prior to the start of construction, the Trade Contractor shall furnish copies of such certificates to the Owner. Applications and certificates must be on forms provided by the Department of Revenue.

ARTICLE 18 - MISCELLANEOUS PROVISIONS

A. This Agreement is made and entered into subject and conformable to the laws of the State of Colorado and the Home Rule Charter of the City of Northglenn. To the extent any provision hereof is inconsistent with said laws and Charter, said laws and Charter shall control.

B. The Trade Contractor shall comply with all federal and state laws and local ordinances and regulations which affect those engaged or employed in the work or which affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same, and shall at all times observe and comply with all such existing laws, ordinances, regulations and decrees, and shall protect and indemnify the Owner and the Engineer against any claim or liabilities arising solely from or based solely on the violations of such law, ordinance, regulation, order or decree, whether by itself, its subconsultants, agents, or employees.

C. The Trade Contractor will take affirmative action to not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex or handicap, if otherwise qualified.

D. In the event any provision of this Agreement is held invalid and unenforceable, the remaining provisions shall be valid and binding upon the parties.

E. One or more waivers by either party of any provision, term, condition or covenant shall not be construed by the other party as a waiver of a subsequent breach of the same by the other party.

F. The Owner and the Trade Contractor each binds itself and its partners, successors,

executors, administrators, and assigns to this Agreement. Neither the Owner nor the Trade Contractor will assign, sublet, or transfer its interest in this Agreement without the written consent of the other.

G. Nothing herein shall be construed as creating any personal liability on the part of any officer or agent of any public body which may be a party hereto, nor shall it be construed as giving any rights or benefits hereunder to anyone other than the Owner and the Trade Contractor.

H. Keep Jobs in Colorado Act: Pursuant to the Keep Jobs in Colorado Act, C.R.S. 8-17-101 *et seq.* (the "Act") and the rules adopted by the Division of Labor of the Colorado Department of Labor and Employment implementing the Act (the "Rules"), the Contractor shall employ Colorado labor to perform at least eighty percent (80%) of the work and shall obtain and maintain the records required by the Act and the Rules. For purposes of this Section "Colorado labor" means any person who is a resident of the state of Colorado at the time of this Project, without discrimination as to race, color, creed, sex, sexual orientation, marital status, national origin, ancestry, age, or religion except when sex or age is a bona fide qualification. A resident of the state is a person who can provide a valid Colorado driver's license, a valid Colorado state-issued photo identification, or documentation that he or she has resided in Colorado for the last thirty (30) days. Contractor represents that it is familiar with the requirements of the Act and the Rules and will fully comply with same. This Section shall not apply to any project for which appropriation or expenditure of moneys may be reasonably expected not to exceed five hundred thousand dollars (\$500,000) in the aggregate for any fiscal year.

ARTICLE 19 - ATTACHMENTS, SCHEDULES AND SIGNATURES

It is further mutually agreed that this Agreement and the contract documents constitute the entire Agreement between the Owner and the Trade Contractor and supersede all prior or oral understandings. This Agreement may only be amended, supplemented, modified, or cancelled by a duly executed written amendment.

IN WITNESS WHEREOF the parties hereto each herewith subscribe the same in triplicate.

CITY OF NORTHGLENN, COLORADO

By: _____

Name: _____

Title: Mayor

ATTEST:

Johanna Small, CMC, City Clerk

APPROVED AS TO FORM:

Corey Y. Hoffmann, City Attorney

TRADE CONTRACTOR

By: _____

Name: _____

Title: _____

STATE OF COLORADO)
) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____,
20__ by _____, as _____ of
_____.

My commission expires: _____

Witness my hand and official seal.

Notary Public



City of Northglenn
11701 Community Center Drive
Northglenn, Colorado 80233

BOND FORM

PERFORMANCE, PAYMENT, MAINTENANCE AND WARRANTY BOND

KNOWN ALL MEN BY THESE PRESENTS, that _____, as Principal, herein called Contractor, and _____, as surety, herein called Surety, are hereby held and firmly bound unto the **City of Northglenn**, as Obligee, herein called the Owner, the amount of _____ Dollars (\$_____) for the payment whereof Contractor and Surety find themselves their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written Agreement dated _____, 20____, entered into a Contract with the Owner for the _____.

Project Number _____ in accordance with Plans and Specifications prepared by _____ which Contract is by reference made a part hereof, and is herein referred to as the Contract.

WHEREAS, Contractor and Surety are jointly and severally liable under the provisions hereof and action against either or both may proceed without prior action against the other, and both may be jointed in one action.

WHEREAS, the Surety hereby waives notice of any alteration of the Contract or extension of time made by Owner.

NOW, THEREFORE, the conditions of this obligation are as follows:

FIRST. The Contractor shall: (1) faithfully perform all requirements and obligations of the Contract, and other applicable law, and satisfy all claims and demands incurred for the same; and (2) fully indemnify and save harmless the City from all costs and damages which the City may incur in making good any default.

SECOND. To the extent permitted by law, the Contractor shall protect, defend, indemnify and save harmless the City and its officers, agents, servants and employees, from and against suits, actions, claims, losses, liability or damage of any character, and from and against costs and expenses, including, in part, attorney fees incidental to the defense of such suits, actions, claims losses, damages or liability on account of injury, disease, sickness, including death, to any person, or damage to property, including, in part, the loss of use, resulting therefrom, based upon or allegedly based upon any act, omission or occurrence of the Contractor, or his employees, servants, agents, subcontractors or suppliers, or anyone else under the Contractor's direction and control (regardless of whether or not cause in part by a party indemnified hereunder), and arising out of, occurring in connection with, resulting from, or caused by the performance or failure of performance of any Work called for by the Contract, or from conditions created by the performance or non-performance of said Work.

Whenever Contractor shall be, and declared by Owner to be in default under Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

1. Complete the Contract in accordance with its terms and conditions or

2. Obtain a Bid or Bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible Bidder, or if the Owner elects upon determination by the Owner and the Surety Jointly of the lowest responsible bidder, arrange form a Contract between such Bidder and Owner, and make available as Work progresses (even though there should be a default or succession of defaults under Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph, shall mean the total amount payable by Owner to Contractor under Contract and any Contract Change Orders thereto, less the amount properly paid by Owner to Contractor.

THIRD. The Contractor shall pay all persons, firms and corporations, all just claims due them for the payment of all laborers and mechanics for labor performed, for all materials and equipment used or rented in the performance of the work covered by the Contract subject, however, to the following conditions.

1. A claimant is defined as one having a direct Contract with the Principal, or with a Subcontractor of the Principal for labor material or both, used or reasonably required for use in performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.
2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's Work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be due the claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.
3. No suit or action shall be commenced hereunder by any claimant:
 - a. Unless claimant, other than one having a direct Contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the Work or labor was done or performed. Such notice shall be served by mailing same by registered mail or certified, postage prepaid, in an envelope addressed to the Principal, Owner, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid Project is located, save that such service need not be made by a public officer.
 - b. After expiration of six (6) months following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof is situated, or in the United States District Court for the District in which the Project, or any part thereof, is situated, and not elsewhere.

FORTH. The Contractor and Surety shall guarantee and warrant that all Work shall remain in good order and repair for a period of **two (2) years** from date of probationary acceptance from all causes arising from defective workmanship and materials, and shall make all repairs arising from said causes during such period without further compensation, and shall guarantee the Facilities and Work and areas within the public rights-of-way affected by such Facilities in good order and repair without further compensation for a period of two (2) years from and after final acceptance thereof by the City. The determination of the necessity for the repair or replacement of any Work or Facilities shall rest entirely with the City, and the City's decision upon the matter shall be final and obligatory upon the Contractor, subject to judicial review pursuant to applicable law.

The Surety shall be deemed and held, notwithstanding any Contract provision, or other agreement to the contrary, to consent without notice to:

1. Any extension of time to the Contractor in which to perform any Work, Permit conditions or obligations.
2. Any change in the Permit or other Permit documents.

Further, the Surety shall pay to the City all costs and attorney fees necessary to enforce the provisions of the bond provisions contained herein.

Unless prohibited by law, an action on this bond may be brought by the City or any person entitled to the benefits of this bond at any time with two (2) years from the date of final acceptance of the Work performed pursuant to the Permit.

Upon full compliance with all the obligations of the Contract, the City shall release this bond, in writing. This bond shall remain in effect until released by the City or the City consents in writing to acceptance of a substitute bond.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this _____ day of _____, 20 ____.

Witness

Contractor

Title

Title

Witness

Surety

Title

Title



City of Northglenn
11701 Community Center Dr.
Northglenn, CO 80233

NOTICE OF AWARD

TO: _____

PROJECT NAME: _____

PROJECT NUMBER: _____

PROJECT MANAGER: _____

The **City of Northglenn (CITY)** has considered the BID submitted by you for the above described work in response to its Invitation For Bid dated _____ and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of _____, and two executed Agreements were presented to the Northglenn City .

You are required by the Instructions to Bidders to furnish the required Certificate of Insurance within ten (10) calendar days from the date of this Notice to you.

You are required to return an acknowledged copy of this NOTICE OF AWARD to CITY at the attention of the Engineering Department.

Dated this _____ day of _____, 20____.

CITY of Northglenn, Colorado

By _____

Name _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged:

CONTRACTOR:

(Name of Contractor)

By _____

Name _____
(Please Type or Print)

Title _____

Consultant:

Return one signed original to:
City of Northglenn
Engineering Division
11701 Community Center Dr.
Northglenn, CO 80233



City of Northglenn
11701 Community Center Dr.
Northglenn, CO 80233

NOTICE TO PROCEED

TO: _____

DATE: _____

PROJECT NAME: _____

PROJECT NUMBER: _____

PROJECT MANAGER: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 20_____, on or before _____ 20_____, and you are to complete the WORK within _____ days thereafter. The date of completion of all work is therefore _____, 20_____.

CITY of Northglenn, Colorado

By _____
Name _____
Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged this _____ day of _____, 20_____.

CONTRACTOR:

(Name of Contractor)

By _____
Name _____
(Please Type or Print)
Title _____

Return one signed original
Notice To Proceed to:

City of Northglenn
Engineering Division
P.O. Box 330061
Northglenn, CO 80233-8061



Owner: City of Northglenn
 11701 Community Center Drive
 Northglenn, CO 80233-8061

Payment Application and Certification

Project: Project Name _____ Address _____ City, State Zip _____	Payment Application No.: 1 _____ Period From: _____ Period To: _____ Project Number: # _____ Contract Date: _____ Project Manager: Company _____ Address _____ City, State Zip _____	Distribution: <input type="checkbox"/> Owner <input type="checkbox"/> Construction Manager <input type="checkbox"/> Project Manager <input type="checkbox"/> Contractor
Contractor: Company _____ Address _____ City, State Zip _____		

Application for Payment Summary	Certification for Payment																																																																																															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">1. Original Contract Sum</td> <td style="width: 10%; text-align: right;">\$</td> <td style="width: 10%; text-align: center;">-</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td>2. Net Change By Change Orders</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td colspan="5">a. Total changes approved in previous months</td> </tr> <tr> <td style="padding-left: 20px;">Additions</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Deductions</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td colspan="5">b. Total changes approved this month</td> </tr> <tr> <td style="padding-left: 20px;">Additions</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td style="padding-left: 20px;">Deductions</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>3. Contract Sum To Date (Line 1 + Line 2)</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>4. Total Completed and Stored (Column G, page 2)</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>5. Total Retainage</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td colspan="5">a. Completed Work Retainage (Retainage for Column D + Column E, page 2)</td> </tr> <tr> <td style="padding-left: 20px;">Completed Work Retainage</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td colspan="5">b. Stored Material Retainage (Retainage for Column F, page 2)</td> </tr> <tr> <td style="padding-left: 20px;">Stored Material Retainage</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>6. Total Completed and Stored Less Retainage (Line 4-Line 5)</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>7. Less Previous Payment Applications (Line 6 of previous application)</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>8. Current Payment Due (Line 6 less Line 7)</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> <tr> <td>9. Balance to Finish, Including Retainage (Line 3 less Line 6)</td> <td style="text-align: right;">\$</td> <td style="text-align: center;">-</td> <td></td> <td></td> </tr> </table>	1. Original Contract Sum	\$	-			2. Net Change By Change Orders	\$	-			a. Total changes approved in previous months					Additions	\$	-			Deductions	\$	-			b. Total changes approved this month					Additions	\$	-			Deductions	\$	-			3. Contract Sum To Date (Line 1 + Line 2)	\$	-			4. Total Completed and Stored (Column G, page 2)	\$	-			5. Total Retainage	\$	-			a. Completed Work Retainage (Retainage for Column D + Column E, page 2)					Completed Work Retainage	\$	-			b. Stored Material Retainage (Retainage for Column F, page 2)					Stored Material Retainage	\$	-			6. Total Completed and Stored Less Retainage (Line 4-Line 5)	\$	-			7. Less Previous Payment Applications (Line 6 of previous application)	\$	-			8. Current Payment Due (Line 6 less Line 7)	\$	-			9. Balance to Finish, Including Retainage (Line 3 less Line 6)	\$	-			<p>Contractor certifies that the amount requested on this Payment Application is based on work completed in accordance with the terms of the contract for Project No. #</p> <p>Contractor Signature: _____</p> <p>By: _____ Date: _____</p> <p>Amount Certified: \$ _____ -</p> <p>Project Manager Signature: _____</p> <p>By: _____ Date: _____</p> <p>Construction Manager Signature: _____</p> <p>By: _____ Date: _____</p> <p>Notary Signature: _____</p> <p>By: _____ Date: _____</p>
1. Original Contract Sum	\$	-																																																																																														
2. Net Change By Change Orders	\$	-																																																																																														
a. Total changes approved in previous months																																																																																																
Additions	\$	-																																																																																														
Deductions	\$	-																																																																																														
b. Total changes approved this month																																																																																																
Additions	\$	-																																																																																														
Deductions	\$	-																																																																																														
3. Contract Sum To Date (Line 1 + Line 2)	\$	-																																																																																														
4. Total Completed and Stored (Column G, page 2)	\$	-																																																																																														
5. Total Retainage	\$	-																																																																																														
a. Completed Work Retainage (Retainage for Column D + Column E, page 2)																																																																																																
Completed Work Retainage	\$	-																																																																																														
b. Stored Material Retainage (Retainage for Column F, page 2)																																																																																																
Stored Material Retainage	\$	-																																																																																														
6. Total Completed and Stored Less Retainage (Line 4-Line 5)	\$	-																																																																																														
7. Less Previous Payment Applications (Line 6 of previous application)	\$	-																																																																																														
8. Current Payment Due (Line 6 less Line 7)	\$	-																																																																																														
9. Balance to Finish, Including Retainage (Line 3 less Line 6)	\$	-																																																																																														

Project No.:	RFI Number:	
Project Name:	Date Received:	
Project Manager:	Date Required:	
Project Engineer:	Forwarded To:	
Contractor:	Date Responded:	
Specification No.:	Page No.:	
check one: <input type="checkbox"/> RFI	<input type="checkbox"/> Design Modification	<input type="checkbox"/> Proposed VE
check one: <input type="checkbox"/> Standard Specification	<input type="checkbox"/> Supplemental Specification	<input type="checkbox"/> Special Provision
Plan Sheet No.:	Detail:	

REQUEST:

PROPOSED SOLUTION (If applicable):

By: _____ Signature: _____ Date: _____

RESPONSE:

By: _____ Signature: _____ Date: _____

After reviewing the response, does the contractor anticipate:

That a change order will be required? Yes No

That there will be an increase in the cost of the project? Yes No

Project: Project Name
Address
City, State Zip
To: Company
Address
City, State Zip

Field Change Directive:
Date:
Number: Project Number
Contract Date:

YOU ARE HEREBY DIRECTED TO MAKE THE FOLLOWING CHANGES TO THE ABOVE NAMED CONTRACT:

Item #	Description	Amount
1	Description	\$0.00
Total		\$0.00

Contract Status Per This Change Order

The Time To Complete The Contract Is:

Unchanged _____

Increased By _____ Days

Decreased By _____ Days

The Date Of Completion Is Now: _____

City of Northglenn
Owner

Company
Contractor

Name

Name

Title

Title

Signature

Signature

Date

Date

Project: Project Name

Change Order #: 1
Date:

To: Company
Address
City, State Zip

Contract Number: Project Number
Contract Date:

YOU ARE HEREBY DIRECTED TO MAKE THE FOLLOWING CHANGES TO THE ABOVE NAMED CONTRACT:

Item #	Description	Amount
1	Description	
Total		\$0.00

Contract Status Per This Change Order

Original Contract Sum	_____
Net Change By Previous Change Orders	\$0.00
Contract Sum Prior To This Change Order	\$0.00
Net Change Made By This Change Order	\$0.00
New Contract Sum	\$0.00

The Time To Complete The Contract Is:

Unchanged x

Increased By _____ Days

Decreased By _____ Days

The Date Of Completion Is Now: _____

City of Northglenn _____

Owner _____

Heather Geyer _____

Name _____

City Manager _____

Title _____

Signature _____

Date _____

Company _____

Contractor _____

Name _____

Title _____

Signature _____

Date _____

City of Northglenn _____

Engineer _____

Kent Kisselman, P.E. _____

Name _____

Director of Public Works _____

Title _____

Signature _____

Date _____

CITY OF NORTHGLENN Farmers Ditch Bridge

LOCATED IN
TOWNSHIP 2 SOUTH, RANGE 68 WEST, 6th P.M.
COUNTY of ADAMS, STATE of COLORADO
NOVEMBER, 2023

OWNER

City of Northglenn
11701 Community Center Drive
Northglenn, CO 80233
303-451-8326

ENGINEER

J&T Consulting, Inc.
Jason Murray
305 Denver Ave., Ste. D
Fort Lupton, CO 80621
303-857-6222
Fax: 303-857-6224

STRUCTURAL ENGINEER

The Lepetsos Group, Inc.
Greg Lepetsos
11 Paonia
Littleton, CO 80127
720-231-1876

NOTES:

- IF ANY DISCREPANCIES BETWEEN THESE PLANS ARE FOUND NOTIFY THE ENGINEER IMMEDIATELY.
- ALL BACKFILL TO BE COMPACTED TO 95% ASTM D698 AT 0 - 2% ABOVE OPTIMUM MOISTURE.

REINFORCING STEEL:

- FABRICATE AND PLACE REINFORCING BARS IN ACCORDANCE WITH CRSI "MANUAL OF STANDARD PRACTICE" AND CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS."
- REINFORCING STEEL TO COMPLY WITH ASTM A615, GRADE 60.
- LAP WALL STEEL IN CAST CONCRETE AROUND CORNERS AS SHOWN ON THE DRAWINGS.

BAR SIZE	LAP LENGTH	90° HOOK DIMENSION
#5	3'-4"	10"

REINFORCED CONCRETE:

- ALL CONCRETE SHALL BE CDOT CLASS D AND HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,500 PSI.
- CEMENT SHALL CONFORM TO ASTM C150, TYPE II; AGGREGATES TO ASTM C33.
- CONCRETE SHALL CONTAIN 5-8% AIR ENTRAINMENT.

HORIZONTAL CONTROL:

PROJECT CONTROL COORDINATE TABLE (ASSUMED COORDINATE BASIS)				
PT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
7	1204904.58	3136155.45	5417.20	MAG NAIL IN CONCRETE
44	1204918.78	3136274.71	5417.10	MAG NAIL IN CONCRETE



200 100 0 100 200
SCALE IN FEET

VICINITY MAP
SCALE 1" = 100'±



SHEET INDEX

1	Cover Sheet
2	General Notes
3	Site Plan
4	Bridge Details
5	Erosion Control Details

ISSUED FOR BID

J&T Consulting, Inc.

305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.jtconsulting.com

Farmers Canal Bridge

Cover Sheet

City of Northglenn

REVISIONS

Description

No.

Date

By

Chk

Job # 22035

Date

Drawn By WSS

Designed By WSS

Checked By JCY

File JT-Bridge Cover.dwg

Scale As Shown

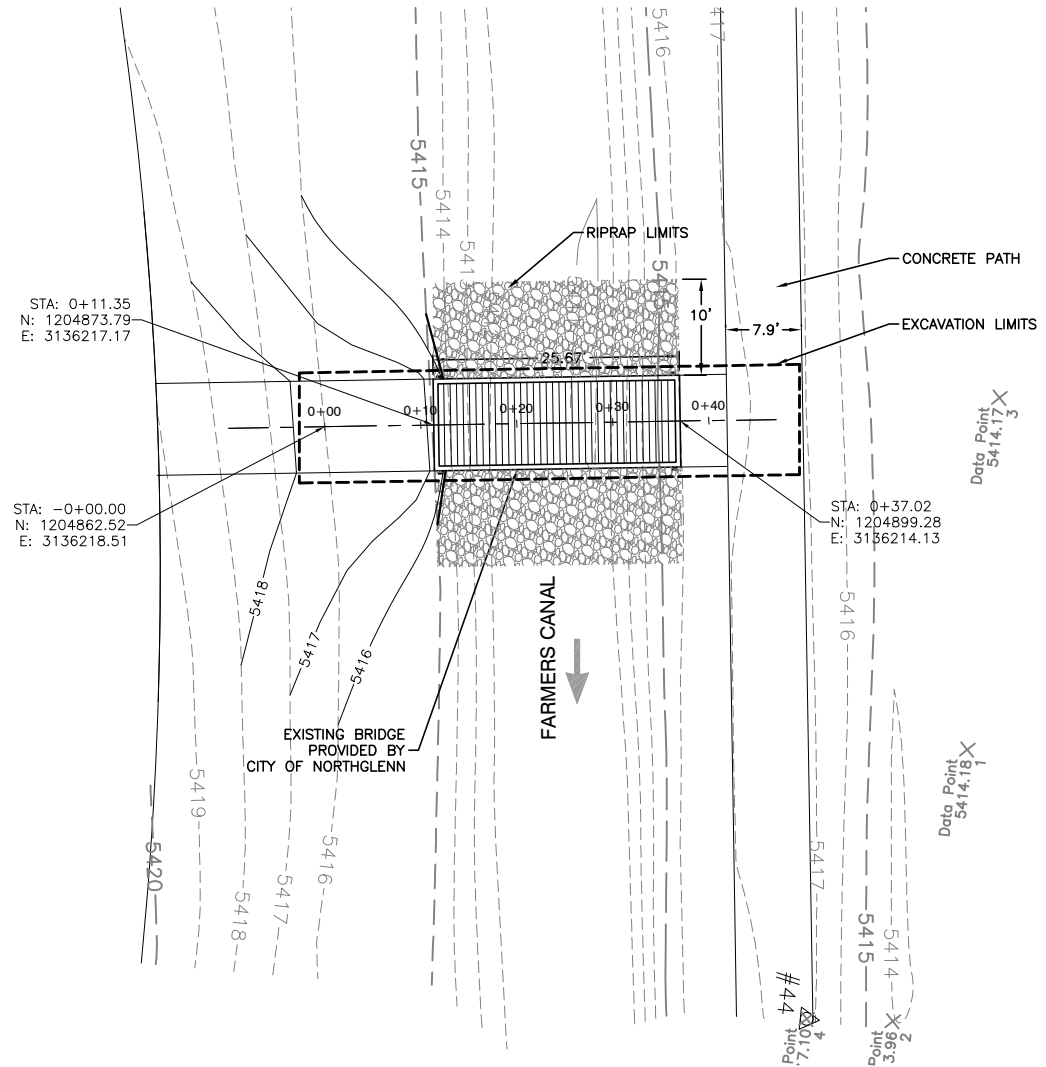
Sheet: 1 of 5



Engineer's Certification

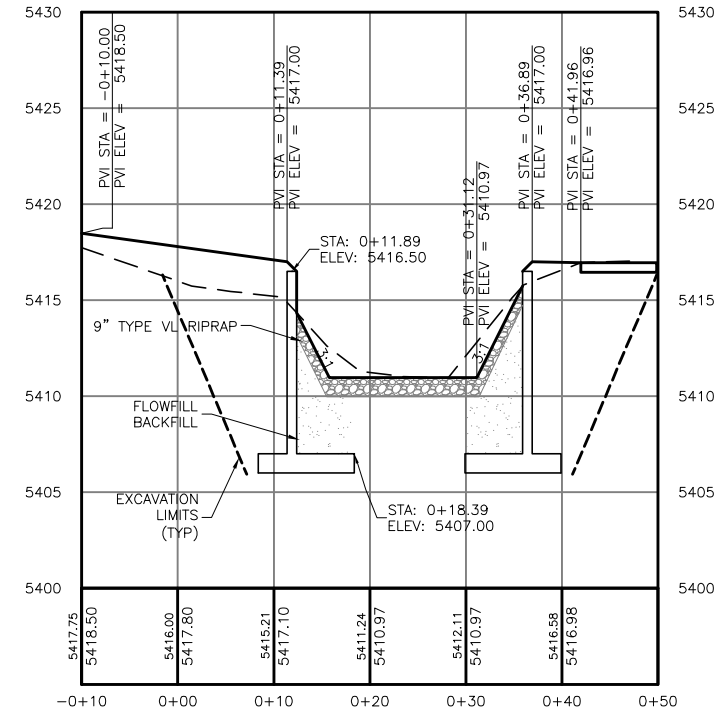
I hereby certify that these plans for the construction of the Northglenn Farmers Canal Flume Improvements Project were prepared by me or under my direct supervision for the Northglenn Urban Renewal Authority.

James C. York, P.E.
Colorado Registration No. 36846

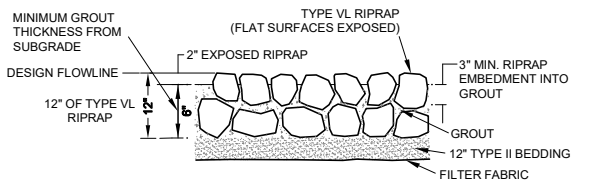


NOTES:

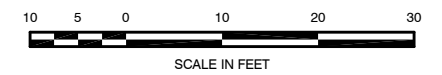
1. CONTRACTOR TO SAND BLAST BRIDGE REMOVING ALL RUST AND PAINT.
2. REPAINT BRIDGE WITH TNEMEC SERIES 49 MULTI-PURPOSE EPOXY.
3. REPAIR ANY SECTIONS AS DIRECTED.
4. TRANSPORT BRIDGE SECTION FROM CITY YARD AND SET BRIDGE ON NEW FOUNDATION.
5. NATIVE MATERIAL, CLAY, TO BE USED FOR BACKFILL TO RECONSTRUCT CANAL.



TYPE VL RIPRAP ($d_{50} = 6''$)	
ROCK SIZE (inches)	% PASSING BY WEIGHT
12	70-100
9	50-70
6	35-50
2	2-10



TYPICAL BEDDING



ISSUED FOR BID



J&T Consulting, Inc.
305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.jtconsulting.com

Farmers Canal Bridge

Bridge Plan & Profile

City of Northglenn

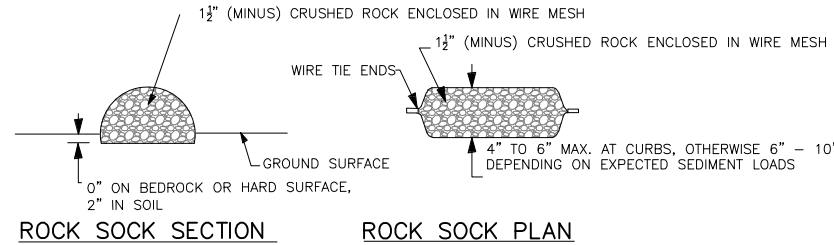
REVISIONS		Description
No	Date	By

Job #	22035
Date	
Drawn By	WSS
Designed By	WSS
Checked By	JCY
File	JT-Bridge profile.dwg
Scale	As Shown

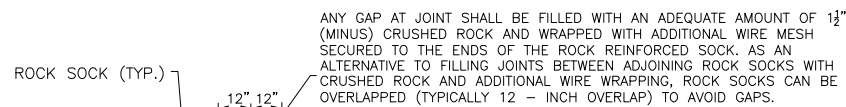
Sheet: **3** of **5**

SEDIMENT AND EROSION CONTROL

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEDIMENT AND EROSION CONTROL AT THE SITE THROUGHOUT CONSTRUCTION.
- ROCK SOCKS SHALL AND SEDIMENT CONTROL LOGS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITY (STOCKPILING, STRIPPING, GRADING, ETC.)
- BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE USED AS NECESSARY TO ADDRESS SEDIMENT AND DUST FROM SITE DISTURBANCE. ADDITIONAL MEASURES MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.
- BMP'S MAY INCLUDE, BUT ARE NOT LIMITED TO:
 - MINIMAL DISTURBANCE FOR MINIMAL TIME PERIODS
 - GRAVEL CONSTRUCTION ENTRIES
 - SILT FENCE, STRAW BALE OR SAND BAG BARRIERS, ROCK CHECK DAMS
 - STORM SEWER INLET PROTECTION
 - SEDIMENT CAPTURE PONDS
 - SITE WATERING FOR DUST SUPPRESSION
- BMP'S SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL INSPECT BMP'S WEEKLY AND AFTER SIGNIFICANT (GREATER THAN 0.1" PRECIPITATION) STORM EVENTS. THE MAINTENANCE AND REPAIR SHALL BE COMPLETED IN A TIMELY MANNER. SEDIMENT AND DEBRIS SHALL BE REMOVED WHEN THEY REACH HALF THE BMP HEIGHT OR IMPACT THE FUNCTION OF THE BMP.
- SOIL STOCKPILES SHALL BE PROTECTED FROM SEDIMENT TRANSPORT BY SURFACE ROUGHENING, WATERING AND PERIMETER SILT FENCING. SOILS THAT WILL BE STOCKPILED FOR MORE THAN 30 DAYS SHALL BE MULCHED AND SEEDED WITH A GRASS COVER WITHIN 14 DAYS OF STOCKPILE CONSTRUCTION.
- THE CONTRACTOR SHALL INSURE THAT ALL LOADS OF CUT AND FILL SOILS IMPORTED TO OR EXPORTED FROM THE SITE ARE PROPERLY LOADED AND COVERED TO PREVENT LOSS DURING TRANSPORT.
- THE CONTRACTOR SHALL REMOVE ALL SEDIMENT, MUD, AND CONSTRUCTION DEBRIS RESULTING FROM THIS PROJECT FROM FLOWLINES AND PAVEMENT OF PUBLIC STREETS IN A TIMELY MANNER.
- SOILS EXPOSED DURING LAND DISTURBING ACTIVITY SHALL BE KEPT IN A ROUGHENED CONDITION BY RIPPING OR DISCING ALONG LAND CONTOURS UNTIL MULCH, VEGETATION OR OTHER PERMANENT EROSION CONTROL IS IN PLACE. NO SOILS SHALL REMAIN EXPOSED BY LAND DISTURBING ACTIVITY FOR MORE THAN THIRTY (30) DAYS BEFORE REQUIRED TEMPORARY OR PERMANENT EROSION CONTROL IS INSTALLED UNLESS OTHERWISE APPROVED.
- ALL TEMPORARY SEDIMENT CONTROLS WILL BE REMOVED WITHIN 30 DAYS AFTER THE FINAL STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, WHICHEVER OCCURS FIRST.
- NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHENEVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.



ROCK SOCK SECTION **ROCK SOCK PLAN**



ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
NO. 4	
2"	100
1 1/2"	90 - 100
1"	20 - 55
3/4"	0 - 15
3/8"	0 - 5

MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.

ROCK SOCK INSTALLATION NOTES

- SEE PLAN VIEW FOR LOCATION OF ROCK SOCKS.
- CRUSHED ROCK SHALL BE 1-1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1 1/2" MINUS).
- WIRE MESH SHALL BE FABRICATED OD 10 GAGE POULTRY MESH OR EQUIVALENT WITH A MAXIMUM OPENING OF 1/2", RECOMMENDED MINIMUM ROLL WIDTH OF 48".
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

ROCK SOCK DETAIL

N.T.S.

PORTABLE CONCRETE WASHOUT CONTAINER

DESCRIPTION
A PORTABLE, SELF-CONTAINED AND WATERTIGHT CONTAINER THAT CONTROLS, CAPTURES, AND CONTAINS CAUSTIC CONCRETE WASTEWATER AND WASHOUT MATERIAL.

PURPOSE & OBJECTIVE
ALLOWS TRADE PERSONNEL TO EASILY WASHOUT CONCRETE TRUCKS, PUMPS, AND OTHER EQUIPMENT ASSOCIATED WITH CEMENT ON SITE AND ALLOWS EASY OFF SITE RECYCLING OF THE SAME CONCRETE MATERIAL AND WASTEWATER.

APPLICATION
CONSTRUCTION PROJECTS WHERE CONCRETE, STUCCO, MORTAR, GROUT, AND CEMENT ARE USED AS A CONSTRUCTION MATERIAL OR WHERE CEMENTITIOUS WASTEWATER IS CREATED.

MAINTENANCE
INSPECT AND CLEAN OUT WHEN 3/4 FULL, NOT ALLOWING THE CONTAINER TO OVERFLOW. INSPECT WASTEWATER LEVEL AND REQUEST VACUUM IF NEEDED. INSPECT SUBCONTRACTORS TO ENSURE THAT PROPER HOUSEKEEPING MEASURES ARE EMPLOYED WHEN WASHING OUT EQUIPMENT.

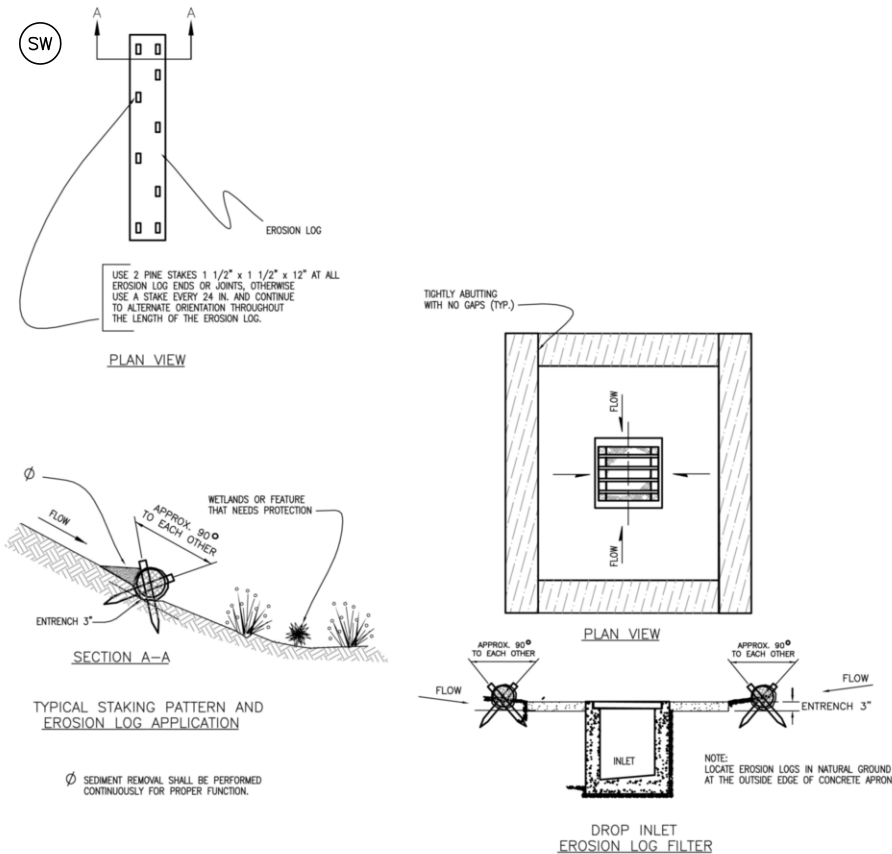
SPECIFICATIONS
THE CONTAINER MUST BE PORTABLE AND TEMPORARY, WATERTIGHT, AND HAVE A HOLDING CAPACITY TO ACCEPT WASHOUT FROM APPROXIMATELY 100 YARDS OF POURED CONCRETE. A VACUUM SERVICE MUST ACCOMPANY WASHOUT CONTAINER AND BE USED BY SITE SUPERINTENDENT AS NEEDED. THE WASH WATER MUST BE DISPOSED OF OR TREATED AND RECYCLED IN AN ENVIRONMENTALLY SAFE MANNER WITHIN FEDERAL, STATE, OR LOCAL REGULATORY GUIDELINES.

TARGETED POLLUTANTS
CAUSTIC WASTEWATER (HIGH PH LEVEL NEAR 12 UNITS)
SUSPENDED SOILS
ASSORTED METALS: CHROMIUM VI, NICKEL, SULFATE, POTASSIUM, MAGNESIUM, AND CALCIUM COMPOUNDS.

LEGEND:

RS ROCK SOCK CWA CONCRETE WASH AREA

SW STRAW WADDLES



STRAW WADDLE DETAIL

N.T.S.

ISSUED FOR BID

J&T Consulting, Inc.

305 Denver Avenue - Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222 Fax: 303-857-6224
www.jtconsulting.com

Farmers Canal Bridge

Erosion Control Details

City of Northglenn

REVISIONS		Description
No.	Date	By

Job #	22035
Date	
Drawn By	WSS
Designed By	WSS
Checked By	JCY
File	JT-eros ctr det.dwg
Scale	As Shown
Sheet:	5 of 5

ISSUED FOR BID

TECHNICAL SPECIFICATIONS

FARMERS DITCH BRIDGE



NOVEMBER, 2023

PREPARED FOR:

CITY OF NORTHGLENN
12301 CLAUDE COURT
NORTHGLENN, CO 80241

PREPARED BY:



J&T Consulting, Inc.

305 DENVER AVENUE – SUITE D
FT. LUPTON, CO 80621
PHONE: 303-857-6222
FAX: 303-857-6224

DOCUMENT 00 01 10

TABLE OF CONTENTS

Section	Title
00 01 10	Table of Contents
DIVISION 01 - GENERAL REQUIREMENTS	
01 00 00	Special Conditions
01 32 16	Construction Progress Schedule
01 33 00	Submittal Procedures
01 40 00	Quality Requirements
01 70 00	Execution and Closeout Requirements
DIVISION 03 - CONCRETE	
03 10 00	Concrete Forming and Accessories
03 20 00	Concrete Reinforcing
03 30 00	Cast-In-Place Concrete
03 35 00	Concrete Finishing
03 39 00	Concrete Curing
03 60 00	Grouting
DIVISION 31 - EARTHWORK	
31 05 13	Soils for Earthwork
31 10 00	Site Clearing
31 23 16	Excavation
31 23 17	Trenching, Backfilling, and Compaction
31 25 13	Erosion Controls
DIVISION 32 – EXTERIOR IMPROVEMENTS	
32 92 19	Open Space Revegetation

END OF SECTION

SECTION 010000 - SPECIAL CONDITIONS TO THE CONSTRUCTION CONTRACT

PART 1 GENERAL

1.01 PROJECT SIGNS – Not used

1.02 EXISTING CONDITIONS

The bidder represents that he has carefully examined the contract documents and the site where the work is to be performed in accordance with the provisions of the General Conditions, and that he has familiarized himself with all local conditions and federal, state, and local laws, ordinances, rules, and regulations that may affect the performance of the work. The bidder further represents that he has studied all documents pertaining to the job site, that he has performed such additional surveys and investigations as he deems necessary to assure himself of his ability to complete the work at this bid price, and that he has correlated the results of all such data with the requirements of the contract documents.

The submittal of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, including locality, uncertainty of weather and all other contingencies, and as to the character, quality quantities, and scope of work.

The plans and specifications for the work show subsurface conditions or otherwise hidden conditions as they might be expected to exist; but it is not intended nor is it to be inferred that showing said conditions constitute a representation that such conditions are accurate or complete.

Where the City or the Engineer or their consultants have made investigations of subsurface conditions in areas where the work is to be performed, such investigations were made only for the purpose of study and design. The conditions indicated by such investigations apply only at the specific location of each boring or excavation at the time the borings or excavations were made.

Where such investigations have been made, bidders or Contractors may inspect the records as to such investigations subject to the above limitations. The record of such investigations is not a part of the contract and is provided solely for the convenience of the bidder or Contractor.

No information derived from such inspection of records of investigation or compilation thereof made by the City, the Engineer, or their consultant will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the contract nor entitle the Contractor to any additional compensation.

Excavated soils which are excessively wet as determined by soil sampling and testing should be dried prior to being used in the backfill operation, or at the Contractor's option, be replaced with suitable backfill material from other areas of the project at no additional cost to the City. Also, excavated soils containing debris, rubble, organic, and deleterious substances are not acceptable for use as backfill and shall be disposed of properly by the Contractor at no cost to the City.

1.03 MOBILIZATION

The Contractor shall limit storage equipment and supplies and remain within the staging areas shown on the Drawings.

The Contractor shall supply portable sanitary facilities for the site.

Prior to mobilization, the Contractor shall document existing condition of site using photos and/or videos.

1.04 MATERIALS TESTING

The City of Northglenn will provide testing services for backfill compaction, concrete and asphalt testing, and verification of filter media testing.

The Contractor shall be responsible for coordinating testing. The Contractor shall give the testing service 24-hours notice for testing. The testing service reserves the right to reject any request for testing with less than 24-hours notice. The Contractor agrees to pay for all retesting due to failed tests at no cost to the Owner.

1.05 SURVEYING

The Contractor shall obtain and pay for surveying services for the staking of the project. The surveyor employed will be a Colorado Registered Licensed Surveyor and have the expertise to perform such services. All costs associated with surveying shall be included in the price of the project.

1.06 CONTRACTOR'S WORK HOURS

CONTRACTOR (and Subcontractor) regular working hours consist of up to 10 working hours between 7:00 a.m. and 5:00 p.m., on a regularly scheduled basis, excluding Saturdays, Sundays, and holidays.

1.07 CONNECTIONS TO EXISTING PIPE SYSTEMS

It shall be the Contractor's responsibility to verify the location of all existing valves and pipe systems, prior to the start of construction; and also verify the horizontal and vertical locations of all other utilities, sewers or water lines that may be affected by work.

1.09 COORDINATION AND NOTIFICATION OF SERVICE DISRUPTION – NOT USED

1.10 COMMUNICATION WITH THE PUBLIC – NOT USED

1.11 COORDINATION WITH CITY STAFF – NOT USED

1.12 CONSTRUCTION PHASING AND SCHEDULING

The anticipated Notice to Proceed is _____.

The date of Substantial Completion is March 31, 2024. The Farmers' Highline Canal is turned on in April.

1.13 LOCATING AND MARKING EXISTING UTILITIES

The Contractor shall have all existing utilities marked prior to construction and verify their location. Existing utility information shown on the Drawings has been confirmed by only limited locate and potholing data, and may not reflect the exact position of existing utilities, and may not show all the utility lines present.

The City will mark City-owned utilities, but other utilities will need to be located. Coordinate utility locates through the Utility Notification Center of Colorado, call 811.

City-located utilities will be marked only one time. The Contractor shall be responsible for maintaining the locate marks. The Contractor must request the locates of City-owned utilities periodically as the work progresses rather than as a single event. Requests for locates shall not precede the construction activity in any given area by more than 2 weeks.

Utility potholing for location of existing utilities is required. All potholing must be completed and the information provided to the Project Engineer prior to installing any pipe.

1.14 CONSTRUCTION MATERIAL STOCKPILE REQUIREMENTS

Construction stockpiles for earth, bedding materials and pipe materials should be placed in designated areas. Contractor shall coordinate and review stockpiling with the City prior to the work.

Excavated material and imported backfill material that is not scheduled to be placed as backfill within two days shall be moved to a permanent stockpile location. Measures to control migration of sediment from stockpiles should be put in place, especially if left overnight or over a weekend or other breaks in the work.

1.15 CONSTRUCTION EQUIPMENT

The City has expressed the need to maintain the condition of the existing pavement and concrete infrastructure outside the project work areas, and along equipment and material haul routes. The use of appropriate construction equipment that is adequate to complete the required work for this project while minimizing pavement and concrete damage outside the defined work areas shall be required. The Contractor shall be held responsible for damages outside the defined work areas created by his activities.

1.16 PROTECTION OF EXISTING UTILITIES

Existing utilities that are not scheduled for replacement, removal or relocation shall be protected to avoid disruption of service. Adequate shoring, bracing and blocking shall be put in place to avoid damage or shifting of the utility lines and trench materials. All repairs required due to the work of the Contractor shall be the responsibility of the Contractor.

1.17 OPERATING EXISTING VALVES AND HYDRANTS – NOT USED

1.18 CONSTRUCTION WATER

Use of a fire hydrant to supply construction water will require the Contractor to pay a \$1,123 fee for renting a meter and backflow preventer from the City. Water usage is applied to the fee paid, with any balance to be refunded when the meter and backflow preventer are returned. Construction water from the City may not be obtained from an unmetered source.

1.19 PROTECTION OF EXISTING LANDSCAPING

Existing landscaping in the vicinity of the work areas shall be protected from damage, including lawns, shrubs and trees. Landscaping that interferes with the work may be removed after approval from the City and must be replaced in a manner satisfactory to the City and the Engineer. Damaged landscaping shall be replaced in-kind at the expense of the Contractor.

1.20 END OF WORKDAY SITE CONDITIONS

Pipe trenches shall be backfilled to within a maximum of five (5) feet from the end of the pipe at the end of each work day. A solid traffic-duty cover shall be placed over any open trench.

Areas where there is active work and/or stockpiles placed shall be swept daily at the end of the work shift.

All backfilled and stabilized trenches shall be checked daily and repaired as required by the Engineer.

1.21 INSURANCE REQUIREMENTS

Additional Insured. Add the following new paragraph immediately after Paragraph 11.2.1:

11.2.2 In regard to commercial general liability, comprehensive automobile liability, and umbrella liability, the certificates of insurance shall also name the Engineer as listed in the Contract Documents, as additional insured. Contractor shall deliver copies of the certificates of insurance to each additional insured.

Builder's Risk/Property Insurance. Add the following new paragraph immediately after Paragraph 11.3.1.2:

11.3.1.3 In regard to builder's risk/property insurance, the certificates of insurance shall also name the Engineer as listed in the Contract Documents, as additional insured. Contractor shall deliver copies of the certificates of insurance to each additional insured.

General Requirements. Add the following new sub-paragraph immediately after Paragraph 11.4.2.4:

11.4.2.5 With respect to worker's compensation and employer's liability, commercial general liability, comprehensive automobile liability, umbrella liability, Owner's protective liability, and all other liability insurance required by the Contract Documents to be provided by Contractor, Contractor shall require the insurance carriers to waive all rights of subrogation against Engineer, and their respective officers, directors, partners, employees, and agents.

1.22 PROJECT SCHEDULE – NOT USED

END OF SECTION

SECTION 012000 – MEASUREMENT AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Measurement and payment shall be as specified in this Section.
- B. Work to be performed under this contract will be paid for on a unit cost or lump sum basis under the appropriate unit cost or lump sum Bid Items shown on the Bid Schedule. No item of Work shown on the Drawings or in the Specifications will be considered for extra compensation due to a claim that it does not fall within the scope of one of the Bid items.
- C. Contractor shall, within 10 days of receipt of Notice to Proceed, submit a complete breakdown of lump sum and unit cost bid items (Schedule of Values) showing value assigned to each part of Work. Payment for materials delivered but not fully incorporated in Work will be made only if such materials are listed and assigned a value in Contractor's Schedule of Values.
- D. The work of this Contract consists of furnishing all labor, materials, equipment and incidentals required and performing all construction, installation and testing of all improvements, modifications and additions, all as shown on the Drawings and specified in these Specifications.

1.02 BID ITEMS

1. PROJECT MOBILIZATION / DEMOBILIZATION/ BONDS/ INSURANCE
Shall include all labor, materials, equipment, and incidentals required for the Contractor to mobilize. Shall include all costs for Contractor's insurance and bonds, construction permits, licenses and fees, job trailers and site administration expenses, utilities including power, telephone, etc. This item shall not exceed more than five (5) percent of the Base Bid. This item will be paid 50 percent of the total at 25 percent project completion, an additional 30 percent of the total at 50 percent project completion, and the remaining 20 percent of the total at 100 percent project completion.
2. EROSION CONTROL
Shall include all labor, materials, equipment, and incidentals required for construction.
3. CONSTRUCTION STAKING
Shall include all labor, materials, equipment, and incidentals required for construction.
4. PEDESTRIAN / TRAFFIC CONTROL, INCLUDING TEMPORARY PATH AROUND SITE
Shall include all labor, materials, equipment, and incidentals required for construction.
5. SOD LANDSCAPE RESTORATION AND IRRIGATION REPAIR OF ALL DISTURBED AREAS
Shall include all labor, materials, equipment, and incidentals required for construction.
6. REMOVER 6" THICK SIDEWALK WITH 12" CDOT CLASS 6 ROAD BASE, COMPLETE IN PLACE
Shall include all labor, materials, equipment, hauling, and incidentals required for construction.

7. 6" THICK SIDEWALK WITH 12" CDOT CLASS 6 ROAD BASE, COMPLETE IN PLACE
Shall include all labor, materials, equipment, hauling, testing, and incidentals required for construction.
8. BRIDGE ABUTMENTS WITH FOOTER, COMPLETE IN PLACE
Shall include all labor, materials, equipment, hauling, testing, and incidentals required for construction.
9. SAND BLAST BRIDGE AND PAINT, COMPLETE IN PLACE
Shall include all labor, materials, equipment, and incidentals required for construction.
10. BRIDGE REPAIR ALLOWANCE, AS DIRECTED BY CITY
Shall include all labor, materials, equipment, and incidentals required for construction.
11. TRANSPORTATION OF EXISTING BRIDGE AND INSTALLATION OF BRIDGE, COMPLETE IN PLACE
Shall include all labor, materials, equipment, hauling, and incidentals required for construction.
12. FLOWFILL BACKFILL, COMPLETE IN PLACE
Shall include all labor, materials, equipment, hauling, testing, and incidentals required for construction.
13. 12" THICK TYPE VL GROUTED RIPRAP, COMPLETE IN PLACE
Shall include all labor, materials, equipment, hauling, testing, and incidentals required for construction.
14. SITE GRADING
Shall include all labor, materials, equipment, and incidentals required for construction.
15. DEWATERING, AS REQUIRED
Shall include all labor, materials, equipment, and incidentals required for construction.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References.
- B. Quality assurance.
- C. Format.
- D. Schedules.
- E. Submittals.
- F. Review and evaluation.
- G. Updating schedules.
- H. Distribution.

1.2 REFERENCES

- A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, Washington, D.C., The Associated General Contractors of America (AGC).
- B. CPM in Construction Management - Project Management with CPM, O'Brien, McGraw-Hill Book Company, New York.

1.3 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel specializing in CPM scheduling with two years minimum experience in scheduling construction work of complexity comparable to this Project, and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: 2 years minimum experience in using and monitoring CPM schedules on comparable projects.

1.4 FORMAT

- A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable specification section number.

- B. Diagram Sheet Size: 24 inches high x 36 inches wide.
- C. Scale and Spacing: To allow for notations and revisions.

1.5 SCHEDULES

- A. Prepare network analysis diagrams and supporting mathematical analyses using Critical Path Method, under concepts and methods outlined in AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".
- B. Illustrate order and interdependence of activities and sequence of work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.
- C. Illustrate complete sequence of construction by activity, identifying work of separate stages. Indicate dates for submittals including dates for Owner furnished items and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.
- D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 - 1. Preceding and following event numbers.
 - 2. Activity description.
 - 3. Estimated duration of activity, in maximum 15 day intervals.
 - 4. Earliest start date.
 - 5. Earliest finish date.
 - 6. Actual start date.
 - 7. Actual finish date.
 - 8. Latest start date.
 - 9. Latest finish date.
 - 10. Total and free float; accrue float time to Owner and to Owner's benefit.
 - 11. Monetary value of activity, keyed to Schedule of Values.
 - 12. Percentage of activity completed.
 - 13. Responsibility.
- E. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, of accepting revised completion dates, and recomputation of scheduled dates and float.
- F. Required Sorts: List activities in sorts or groups:
 - 1. By preceding work item or event number from lowest to highest.
 - 2. By longest float, then in order of early start.
 - 3. By responsibility in order of earliest possible start date.
 - 4. In order of latest allowable start dates.
 - 5. In order of latest allowable finish dates.
 - 6. Contractor's periodic payment request sorted by Schedule of Values listings or specifications sections.
 - 7. Listing of basic input data generating report.
 - 8. Listing of activities on critical path.

- G. Coordinate contents with schedule of values in Section 01 33 00 - Submittal Procedures.

1.6 SUBMITTALS

- A. Within 10 days after date of Owner-Contractor Agreement, established in Notice to Proceed, submit proposed preliminary network diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.
- B. Participate in review of preliminary and complete network diagrams jointly with Engineer.
- C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analysis.
- E. Submit updated network schedules with each Application for Payment.
- F. Submit number of opaque reproductions Contractor requires, plus two copies Engineer will retain.
- G. Submit under transmittal letter form specified in Section 01 33 00 - Submittal Procedures.

1.7 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of network diagrams and analysis with Architect/Engineer at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise network diagrams and analysis incorporating results of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update diagrams to graphically depict current status of Work.
- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Indicate changes required to maintain Date of Substantial Completion.
- E. Submit sorts required to support recommended changes.

- F. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate contractors.

1.9 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Engineer, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Product data.
- E. Shop drawings.
- F. Samples.
- G. Design data.
- H. Test reports.
- I. Certificates.
- J. Manufacturer's instructions.
- K. Manufacturer's field reports.
- L. Construction photographs.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project, and deliver to Engineer. Coordinate submission of related items.

- F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit preliminary outline Schedules within 15 days after date of Owner-Contractor Agreement established in Notice to Proceed for coordination with Owner's requirements. After review, submit detailed schedules within 15 days modified to accommodate revisions recommended by Engineer.
- B. Submit revised Progress Schedules with each Application for Payment.
- C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- E. Submit computer generated network analysis diagram as specified in Section 01 32 16 - Construction Progress Schedule.
- F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.
- G. Indicate estimated percentage of completion for each item of Work at each submission.
- H. Submit separate schedule of submittal dates for shop drawings, product data, and samples, including Owner furnished products and products identified under Allowances, and dates reviewed submittals will be required from Engineer. Indicate decision dates for selection of finishes.
- I. Indicate delivery dates for Owner furnished products and products identified under Allowances.
- J. Revisions To Schedules:

1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect including effect of changes on schedules of separate contractors.

1.4 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Owner-Contractor Agreement Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

- A. Product Data: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit number of copies Contractor requires, plus two copies Engineer will retain.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 SHOP DRAWINGS

- A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.
 1. Include signed and sealed calculations to support design.

2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit number of opaque reproductions Contractor requires, plus two copies Engineer will retain.
- E. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.7 SAMPLES

- A. Samples: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Samples For Selection as Specified in Product Sections:
1. Submit to Engineer for aesthetic, color, or finish selection.
 2. Submit samples of finishes from full range of manufacturers' standard colors, in custom colors selected, textures, and patterns for Engineer selection.
- C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- D. Include identification on each sample, with full Project information.
- E. Submit number of samples specified in individual specification sections; Engineer will retain one sample.
- F. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- G. Samples will not be used for testing purposes unless specifically stated in specification section.
- H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01 70 00 - Execution and Closeout Requirements.

1.8 DESIGN DATA

- A. Submit for Engineer's knowledge as contract administrator or for Owner.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.9 TEST REPORTS

- A. Submit for Engineer's knowledge as contract administrator or for Owner.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

1.11 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.12 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Engineer's benefit as contract administrator or for Owner.
- B. Submit report in duplicate within 5 days of observation to Engineer for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.13 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Engineer.
- B. Twice monthly submit photographs.
- C. Photographs: One print color, matte; 3 x 5 inch size; mounted on 8-1/2 x 11 inch soft card stock, with left edge binding margin for three hole punch.
- D. Take two site photographs from differing directions and five interior photographs of indicating relative progress of the Work, 7 days maximum prior to submitting.

- E. Identify each print on front. Identify name of Project, phase, orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.
- F. Deliver negatives to Owner with project record documents. Catalog and index negatives in chronological sequence; include typed table of contents.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mock-up requirements.
- F. Testing and inspection services.
- G. Manufacturers' field services.
- H. Examination.
- I. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Owner-Contractor Agreement, except where specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.5 LABELING

- A. Attach label from agency approved by authority having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label.
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.

1.6 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this section and identified in respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be comparison standard for remaining Work.

- D. Where mock-up has been accepted by Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so by Engineer.

1.7 TESTING AND INSPECTION SERVICES

- A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.
- B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Engineer or Owner.
 - 1. Laboratory: Authorized to operate in State of Colorado.
 - 2. Laboratory Staff: Maintain full time registered Engineer on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Engineer or Owner.
- D. Reports will be submitted by independent firm to Engineer, Contractor, and authority having jurisdiction, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as non-compliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.
- F. The Owner's testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Engineer.
- H. Agency Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.

6. Perform additional tests required by Engineer.
 7. Attend preconstruction meetings and progress meetings.
- I. Agency Reports: After each test, promptly submit two copies of report to Engineer, Contractor, and authority having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
1. Date issued.
 2. Project title and number.
 3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product and specifications section.
 6. Location in Project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- J. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer subject to approval of Engineer or Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - Submittal Procedures, MANUFACTURERS' FIELD REPORTS article.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting and balancing.
- F. Protecting installed construction.
- G. Project record documents.
- H. Operation and maintenance data.
- I. Manual for materials and finishes.
- J. Manual for equipment and systems.
- K. Spare parts and maintenance products.
- L. Product warranties and product bonds.
- M. Maintenance service.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.
- B. Provide submittals to Engineer and Owner required by authorities having jurisdiction.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- D. Owner will occupy portions of project as specified in Section 01 10 00 - Summary.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
- C. Clean or Replace filters of operating equipment.
- D. Clean debris from roofs, gutters, downspouts, and drainage systems.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 STARTING OF SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer and Owner seven days prior to start-up of each item.
- C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative and Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01 33 00 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment and instruct in classroom environment at a location to be determined by Engineer and Owner, and instructed by qualified manufacturer's representative who is knowledgeable about the Project.

- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. Required instruction time for each item of equipment and system is specified in individual sections.

1.6 TESTING, ADJUSTING AND BALANCING

- A. Owner will appoint, employ, and pay for services of independent firm to perform testing, adjusting, and balancing.
- B. Reports will be submitted by independent firm to Engineer indicating observations and results of tests and indicating compliance or non-compliance with requirements of Contract Documents.

1.7 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.8 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed Shop Drawings, Product Data, and Samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish grade datum.
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 4. Field changes of dimension and detail.
 5. Details not on original Contract drawings.
- G. Submit documents to Engineer with final Application for Payment.

1.9 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. 1 Originals, 2 Photocopies of warranties and bonds.

1.10 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes in final form within 10 days after final inspection.
- E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.
- F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- H. Additional Requirements: As specified in individual product specification sections.

- I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.11 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes in final form within 10 days after final inspection.
- E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- G. Include color coded wiring diagrams as installed.
- H. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.
- I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- J. Include servicing and lubrication schedule, and list of lubricants required.
- K. Include manufacturer's printed operation and maintenance instructions.
- L. Include sequence of operation by controls manufacturer.
- M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- N. Include control diagrams by controls manufacturer as installed.
- O. Include Contractor's coordination drawings, with color coded piping diagrams as installed.

- P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- R. Include test and balancing reports as specified in Section 01 40 00 - Quality Requirements.
- S. Additional Requirements: As specified in individual product specification sections.
- T. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.12 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.
- B. Deliver to and place in location as directed by Owner; obtain receipt prior to final payment.

1.13 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time Of Submittals:
 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.14 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections during warranty period.
- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in place concrete.
 - 2. Shoring, bracing, and anchorage.
 - 3. Architectural form liners.
 - 4. Form accessories.
 - 5. Form stripping.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
 - 2. ACI 301 - Specifications for Structural Concrete.
 - 3. ACI 318 - Building Code Requirements for Structural Concrete.
 - 4. ACI 347 - Guide to Formwork for Concrete.
- B. American Forest and Paper Association:
 - 1. AF&PA - National Design Specifications for Wood Construction.
- C. The Engineered Wood Association:
 - 1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.
- D. ASTM International:
 - 1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - 2. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- E. West Coast Lumber Inspection Bureau:
 - 1. WCLIB - Standard Grading Rules for West Coast Lumber.

1.3 DESIGN REQUIREMENTS

- A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 318 to conform to design and code requirements to achieve concrete shape, line and dimension as indicated on Drawings.

1.4 PERFORMANCE REQUIREMENTS

A. Not applicable to this Project.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

1.6 SUSTAINABLE DESIGN SUBMITTALS

A. Not applicable to this Project.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 347, ACI 301, and ACI 318.

B. Perform Work in accordance with CDOT standards.

1.8 MOCK-UP

A. Not applicable to this Project.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Products storage and handling requirements.

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor. Contractor to provide submittal.

2.2 PREFABRICATED FORMS

A. Manufacturers: At discretion of Contractor. Contractor to provide submittal.

B. Steel Forms: Sheet steel, suitably reinforced, and designed for particular use indicated on Drawings.

C. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings.

2.3 ARCHITECTURAL FORM LINERS

- A. Not applicable to this Project.

2.4 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, metal, free of defects capable of leaving blemishes in concrete surface as determined by Engineer.
- B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Wire ties, wood spreaders or through bolts are not permitted.
- C. Form Anchors and Hangers:
 - 1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface.
 - 2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member.
 - 3. Penetration of structural steel members is not permitted.
- D. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
 - 1. Manufacturers:
 - a. Arcal Chemical Corporation Arcal-80.
 - b. Industrial Synthetics Company Synthex.
 - c. Nox-Crete Company Nox-Crete Form Coating.
 - d. Or approved equivalent
- E. Corners: Chamfer, rigid plastic or wood strip type; size as applicable.
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.
- G. Water Stops: Rubber and Polyvinyl chloride, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, ribbed profile, preformed corner sections, heat welded jointing.

2.5 COATINGS

- A. Not applicable to this Project.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

- B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.
- C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Engineer.

3.2 INSTALLATION

- A. Earth Forms:
 - 1. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on Drawings.
 - 2. Trim sides and bottom of earth forms.
 - 3. Construct wood edge strips at top of each side of trench to secure reinforcing and prevent trench from sloughing.
 - 4. Form sides of footings where earth sloughs.
 - 5. Tamp earth forms firm and clean forms of debris and loose material before depositing concrete.
- B. Formwork - General:
 - 1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
 - 2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
 - 3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
 - 4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.
 - 5. Complete wedging and bracing before placing concrete.
- C. Forms for Smooth Finish Concrete:
 - 1. Use steel, plywood or lined board forms.
 - 2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
 - 3. Install form lining with close-fitting square joints between separate sheets without springing into place.
 - 4. Use full size sheets of form lines and plywood wherever possible.
 - 5. Tape joints to prevent protrusions in concrete.
 - 6. Use care in forming and stripping wood forms to protect corners and edges.
 - 7. Level and continue horizontal joints.
 - 8. Keep wood forms wet until stripped.
- D. Architectural Form Liners:
 - 1. Erect architectural side of formwork first.
 - 2. Attach form liner to forms before installing form ties.
 - 3. Install form liners square, with joints and pattern aligned.
 - 4. Seal form liner joints to prevent grout leaks.
 - 5. Dress joints and edges to match form liner pattern and texture.

- E. Forms for Surfaces to Receive Membrane Waterproofing: Use plywood or steel forms. After erection of forms, tape form joints to prevent protrusions in concrete.
- F. Framing, Studding and Bracing:
 - 1. Size framing, bracing, centering, and supporting members with sufficient strength to maintain shape and position under imposed loads from construction operations.
 - 2. Construct beam soffits of material minimum of 2 inches thick.
 - 3. Distribute bracing loads over base area on which bracing is erected.
 - 4. When placed on ground, protect against undermining, settlement or accidental impact.
- G. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301 and ACI 318.
- H. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- I. Obtain Engineer's approval before framing openings in structural members not indicated on Drawings.
- J. Install chamfer strips on external corners of beams, joists, columns, and walls.
- K. Do not reuse damaged wood formwork. Do not patch formwork.

3.3 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
- D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer's specifications. Do not coat forms for concrete indicated to receive "scored finish". Apply form coatings before placing reinforcing steel.

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Install formed openings for items to be embedded in or passing through concrete work.
- B. Locate and set in place items required to be cast directly into concrete.

- C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install water stops continuous without displacing reinforcement. Heat seal joints watertight.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- H. Form Ties:
 - 1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
 - 2. Place ties at least 1 inch away from finished surface of concrete.
 - 3. Leave inner rods in concrete when forms are stripped.
 - 4. Space form ties equidistant, symmetrical and aligned vertically and horizontally
- I. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- J. Construction Joints:
 - 1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
 - 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
 - 3. Show no overlapping of construction joints.
 - 4. Arrange joints in continuous line straight, true and sharp.
- K. Embedded Items:
 - 1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
 - 2. Do not embed wood or uncoated aluminum in concrete.
 - 3. Obtain installation and setting information for embedded items furnished under other Specification sections.
 - 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 - 5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.
- L. Openings for Items Passing Through Concrete:
 - 1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
 - 2. Coordinate work to avoid cutting and patching of concrete after placement.

3. Perform cutting and repairing of concrete required as result of failure to provide required openings.
- M. Screeds:
1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
 2. Slope slabs to drain where required or as shown on Drawings.
 3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.
- N. Cleanouts and Access Panels:
1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
 2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.

3.5 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.6 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Engineer.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.
- D. Leave forms in place for minimum number of days as specified in ACI 347.

3.7 ERECTION TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301 and ACI 318.

3.8 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
- C. Notify Engineer after placement of reinforcing steel in forms, but prior to placing concrete.
- D. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Reinforcing bars.
 - 2. Welded wire fabric.
 - 3. Reinforcement accessories.
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 30 00 - Cast-In-Place Concrete.
 - 3. Section 32 13 13: Concrete Paving.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 318 - Building Code Requirements for Structural Concrete.
 - 3. ACI 530.1 - Specifications for Masonry Structures.
 - 4. ACI SP-66 - ACI Detailing Manual.
- B. ASTM International:
 - 1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
 - 3. ASTM A496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
 - 4. ASTM A497 - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
 - 5. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 6. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
 - 7. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
 - 8. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
 - 9. ASTM A775/A775M - Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
 - 10. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement.

11. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
 12. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
 13. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Steel Bars.
- C. American Welding Society:
1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- D. Concrete Reinforcing Steel Institute:
1. CRSI - Manual of Standard Practice.
 2. CRSI - Placing Reinforcing Bars.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Follow submittal procedures.
- B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel bending and cutting schedules, and supporting and spacing devices.
- C. Certificates: Submit AWS qualification certificate for welders employed on the Work.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
 1. Submit certified copies of mill test report of reinforcement materials analysis.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with CRSI - Manual of Standard Practice ACI 301 & ACI 318.
- B. Perform Work in accordance with CDOT standards.

1.6 QUALIFICATIONS

- A. Welders: AWS qualified within previous 12 months.

1.7 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCEMENT

- A. Deformed and Plain Reinforcement: ASTM A615/A615M; 40 and 60 ksi yield strength, steel bars, unfinished and epoxy coated finish.
- B. Welded Plain Wire Fabric: ASTM A185; in coiled rolls; unfinished.

2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type. Manufacturers: At discretion of Contractor.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Type; size and shape to meet Project conditions.
- D. Reinforcing Splicing Devices: Exothermic welding type; full tension and compression; sized to fit joined reinforcing.
 - 1. Manufacturers: At discretion of Contractor.
- E. Reinforcing Splicing Devices: Mechanical set screw, swaged or threaded type; full tension and compression; sized to fit joined reinforcing.
 - 1. Manufacturers: At discretion of Contractor.
- F. Epoxy Coating Patching Material: Type as recommended by coating manufacturer.

2.3 FABRICATION

- A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice & ACI 318.
- B. Form standard hooks for 180 degree bends, 90 degree bend, stirrup and tie hooks, and seismic hooks as indicated on Drawings.
- C. Form reinforcement bends with minimum diameters in accordance with ACI 318.
- D. Form ties and stirrups from the following:
 - 1. For bars No. 10 and Smaller: No. 3 deformed bars.
 - 2. For bars No. 11 and Larger: No. 4 deformed bars.
- E. Weld reinforcement in accordance with AWS D1.4.
- F. Epoxy-Coated Reinforcement: Clean surfaces, weld and re-protect welded joint in accordance with CRSI Manual of Practice.

- G. Locate reinforcement splices, at point of minimum stress. Review location of splices with Engineer.

2.4 SHOP FINISHING

- A. Epoxy Coated Finish for Steel Bars: Per CDOT Standards.
- B. Epoxy Coated Finish for Steel Wire: Per CDOT Standards.

2.5 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Make completed reinforcement available for inspection at manufacturer’s factory prior to packaging for shipment. Notify Engineer at least seven days before inspection is allowed.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.
 - 1. Do not weld crossing reinforcement bars for assembly except as permitted by Engineer.
- B. Accommodate placement of formed openings.
- C. Space reinforcement bars with minimum clear spacing in accordance with ACI 318 of one bar diameter, but not less than 1 inch.
 - 1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.
- D. Maintain concrete cover around reinforcement in accordance with ACI 318 as follows:

Reinforcement Location		Minimum Concrete Cover
Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	1-1/2 inches
Supported Slabs, Walls, and Joists	No. 14 bars and larger	1-1/2 inches
	No. 11 bars and smaller	3/4 inches
Beams and Columns		1-1/2 inches
Shell and Folded	No. 6 bars and larger	3/4 inches

Plate Members	No. 5 bars and smaller	1/2 inches
---------------	------------------------	------------

E. Bond and ground reinforcement in accordance with requirements of Section 26 05 26.

3.2 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Install reinforcement within the following tolerances for flexural members, walls, and compression members:

Reinforcement Depth	Depth Tolerance	Concrete Cover Tolerance
Greater than 8 inches	plus or minus 3/8 inch	minus 3/8 inch
Less than 8 inches	plus or minus 1/2 inch	minus 1/2 inch

C. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Field testing will be performed by Owner's testing laboratory in accordance with ACI 318.

C. Provide free access to Work and cooperate with appointed firm.

D. Reinforcement Inspection:

1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.
2. Welding: Inspect welds in accordance with AWS D1.1.
3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M.
5. Continuous Weld Inspection: Inspect reinforcement as required by ACI 318.
6. Periodic Weld Inspection: Other welded connections.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete for the following:
 - 1. Curb and Gutter
 - 2. Control, expansion and contraction joint devices.
 - 3. Raised Median
 - 4. Sidewalk
 - 5. Sign base.

- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 35 00 - Concrete Finishing.
 - 3. Section 03 39 00 - Concrete Curing.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 305 - Hot Weather Concreting.
 - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 - 4. ACI 308.1 - Standard Specification for Curing Concrete.
 - 5. ACI 318 - Building Code Requirements for Structural Concrete.

- B. ASTM International:
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 3. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 4. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 5. ASTM C42/C42M - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 - 6. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 7. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 - 8. ASTM C150 - Standard Specification for Portland Cement.
 - 9. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
 - 10. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - 11. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

12. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
13. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
14. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
15. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
16. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
17. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
18. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
19. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
20. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
21. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
22. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
23. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
24. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
25. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
26. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
27. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
28. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
29. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
30. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
31. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
32. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
33. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
34. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.3 PERFORMANCE REQUIREMENTS

- A. Not applicable to this Project.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on joint devices, attachment accessories, and admixtures.
- C. Design Data:
 - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 - 2. Identify mix ingredients and proportions, including admixtures.
 - 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
- D. Samples: Submit two samples of expansion/contraction joint and control joint.
- E. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.

1.5 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.6 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 & ACI 318.
- B. Conform to ACI 305 when concreting during hot weather.
- C. Conform to ACI 306.1 when concreting during cold weather.
- D. Acquire cement and aggregate from one source for Work.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with CDOT standards.

1.9 MOCKUP

- A. Not applicable to this Project.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.
- C. Maintain high early strength concrete temperature after installation at minimum 50 degrees F for minimum 3 days.

1.11 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Concrete Materials: Provide in accordance with CDOT standards.

2.2 ADMIXTURES

- A. Furnish materials in accordance with CDOT standards.

2.3 ACCESSORIES

- A. Bonding Agent: Two component modified epoxy resin.
 - 1. Manufacturers:
 - a. At the discretion of the Contractor. Contractor to provide submittal.

2.4 JOINT DEVICES AND FILLER MATERIALS

- A. Furnish materials in accordance with CDOT standards.
- B. Construction Joint Devices: Integral galvanized steel or extruded plastic, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.
- C. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric, vinyl, or neoprene filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; extruded aluminum or vinyl cover plate, of longest manufactured length at each location, recessed mounted; color as selected.

- D. Sealant and Primer: as specified in Section 07 90 00.

2.5 CONCRETE MIX

- A. Provide concrete to the following criteria:
 - 1. Class D:
 - a. Compressive Strength: 4,500 psi at 28 days.
 - b. Slump: Per approved mix design.
 - c. Minimum Cement Content: 615 pounds/cu yd.
 - d. Maximum Water/Cement Ratio: 0.45.
 - e. Air Entrainment: 5 – 8 percent.
- B. Cementitious materials to maximum percentage by mass of all cementitious materials:
 - 1. Fly Ash: Per approved mix design.
 - 2. Blast Furnace Slag: Per approved mix design.
 - 3. Fly Ash and Blast Furnace Slag: Per approved mix design.
- C. Use accelerating admixtures in cold weather only when approved by the Engineer in writing. Use of admixtures will not relax cold weather placement requirements.
- D. Use calcium chloride only when approved by the Engineer in writing.
- E. Use set retarding admixtures during hot weather only when approved by the Engineer in writing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.
- D. Remove water from areas receiving concrete before concrete is placed.

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301 & ACI 318.
- B. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and forms are not disturbed during concrete placement.
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends through taping edges and ends.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.
- G. Place joint filler in slab following pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface. Conform to Section 07 90 00 for finish joint sealer requirements.
- I. Install construction joint devices in coordination with slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Install joint device anchors. Maintain correct position to allow joint cover to be flush with slab finish.
- K. Install joint covers in longest practical length, when adjacent construction activity is complete.
- L. Apply sealants in joint devices in accordance with Section 07 90 00.
- M. Deposit concrete at final position. Prevent segregation of mix.
- N. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- O. Consolidate concrete.
- P. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- Q. Place concrete continuously between predetermined expansion, control, and construction joints.

- R. Do not interrupt successive placement; do not permit cold joints to occur.
- S. Place slabs in pattern indicated.
- T. Saw cut joints within 12 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- U. Screed slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.4 SEPARATE SLAB TOPPINGS

- A. Prior to placing floor topping, [roughen substrate concrete surface and] remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing and other items to be cast in.
- C. Apply bonding agent to substrate.

3.5 CONCRETE FINISHING

- A. Finish concrete to requirements of Section 03 35 00.
- B. Place curing compound on exposed concrete surfaces immediately after finishing.

3.6 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure concrete in accordance with ACI 308.1

3.7 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements and Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform field testing in accordance with CDOT standards.
- C. Inspect reinforcing placement for size, spacing, location, support.
- D. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- E. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.

2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured.
 3. Sample concrete and make one set of four cylinders for every 50 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area paving.
 4. Make one additional cylinder during cold weather concreting, and field cure.
- F. Field Testing:
1. Slump Test Method: ASTM C143/C143M.
 2. Air Content Test Method: ASTM C173/C173M and ASTM C231.
 3. Temperature Test Method: ASTM C1064/C1064M.
 4. Measure slump and temperature for each compressive strength concrete sample.
 5. Measure air content in air entrained concrete for each compressive strength concrete sample.
- G. Cylinder Compressive Strength Testing:
1. Test Method: ASTM C39.
 2. Test Acceptance: In accordance with CDOT standards.
 3. Test one cylinder at 7 days.
 4. Test two cylinders at 28 days.
 5. Retain one cylinder for testing when requested by Engineer.
 6. Dispose remaining cylinders when testing is not required.
- H. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.8 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections as directed by Engineer in accordance with ACI 301 & ACI 318.

3.9 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Architect/Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.10 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. All concrete: 4,500 psi 28 day concrete, light broom finish for flatwork, rough form finish with tie patching for formwork.

3.11 SCHEDULE - JOINT FILLERS – NOT USED

END OF SECTION

03 30 00 - 9

SECTION 03 35 00
CONCRETE FINISHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Finishing concrete slabs.
 - 2. Slab surface treatment.
 - 3. Handicap Ramp Truncated Domes.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 03 39 00 - Concrete Curing.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
- B. ASTM International:
 - 1. ASTM E1155 - Standard Test Method for Determining Floor Flatness and of Levelness Using the F-number System.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Follow submittal procedures.
- B. Product Data: Submit data on concrete hardener, sealer, curing compounds and slip resistant treatment, compatibilities, and limitations.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit data on maintenance renewal of applied coatings.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302.1.

- B. Perform Work in accordance with CDOT standards.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum 5 years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.

1.8 MOCK-UP - NOT USED

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Deliver materials in manufacturer's packaging including application instructions.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

1.11 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate the Work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
 1. Hanoveer
 2. Davis Colors
 3. Or Approved Equivalent.

2.2 COMPOUNDS - SEALERS

- A. Sealer:
Manufacturers: At the discretion of the Contractor. Contractor to provide submittal.

2.3 SLIP RESISTANT TREATMENT

- A. Slip Resistant Finish: At the discretion of the Contractor. Contractor to provide submittal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify slab surfaces are acceptable to receive the Work of this section.

3.2 SLAB FINISHING

- A. Finish concrete slab surfaces in accordance with ACI 301 & ACI 302.1.
- B. Steel trowel surfaces which are to be exposed.
- C. Light broom finish

3.3 SLAB SURFACE TREATMENT – NOT USED

3.4 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation of Surface Flatness For Exposed Concrete Slabs: 1/4 inch in 10 ft.
- C. Correct defects in defined slab floor by grinding or removal and replacement of defective Work. Areas requiring corrective Work will be identified by Engineer. Re-measure corrected areas by same process.

END OF SECTION

SECTION 03 39 00
CONCRETE CURING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes initial and final curing of horizontal and vertical concrete surfaces.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 03 35 00 - Concrete Finishing.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
 - 3. ACI 308.1 - Standard Specification for Curing Concrete.
 - 4. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM International:
 - 1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
 - 2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 - 4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on curing compounds, mats, film, compatibilities, and limitations.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301, ACI 302.1, ACI 318.
- B. Perform Work in accordance with CDOT standard.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Deliver curing materials in manufacturer's packaging including application instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Membrane Curing Compound Type 1 clear or approved equivalent. Contractor to provide submittal on membrane curing compound.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify substrate surfaces are ready to be cured.

3.2 INSTALLATION - HORIZONTAL SURFACES

- A. Cure concrete in accordance with ACI 308.1.
- B. Membrane Curing Compound: Apply curing compound in two coats with second coat applied at right angles to first.

3.3 INSTALLATION - VERTICAL SURFACES

- A. Cure concrete in accordance with ACI 308.1.
- B. Membrane Curing Compound: Apply compound in two coats with second coat applied at right angles to first.

3.4 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.
- B. Do not permit traffic over unprotected floor surface.

3.5 SCHEDULES

- A. Concrete Pavement, Curb/Gutter & Sidewalk: Membrane curing compound, clear color.
- B. Other Colored & Patterned Areas: Per Manufacturer's recommendation, and Engineer's approval.

END OF SECTION

03 39 00 - 3

SECTION 03 60 00

GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portland cement grout.

1.2 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
- B. American Society of Testing and Materials:
 - 1. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 2. ASTM C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
 - 3. ASTM C150 - Standard Specification for Portland Cement.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit product data on grout.

1.4 SUSTAINABLE DESIGN SUBMITTALS (NOT USED)

1.5 QUALITY ASSURANCE

- A. Visually inspect grout as it is delivered to site to determine if adequate slump is maintained to allow for grout to be pumped into abandoned dewatering pipe.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Grout to be delivered to site via mixer trucks.

1.7 ENVIRONMENTAL REQUIREMENTS (NOT USED)

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT MATERIALS

- A. Portland Cement: ASTM C150, Type I and II.
- B. Water:

03 60 00- 1

1. Potable; containing no impurities, suspended particles, algae or dissolved natural salts in quantities capable of causing:
 - a. Corrosion of steel.
 - b. Volume change increasing shrinkage cracking.
 - c. Efflorescence.
 - d. Excess air entraining.
- C. Fine Aggregate:
 1. Washed natural sand.
 2. Gradation in accordance with ASTM C33 and represented by smooth granulometric curve within required limits.
 3. Free from injurious amounts of organic impurities as determined by ASTM C40.
- D. Mix:
 1. Portland cement, sand and water. Do not use ferrous aggregate or staining ingredients in grout mixes.

PART 3 - EXECUTION

3.1 PLACING GROUT

- A. Place grout material by pumping quickly and continuously to ensure abandoned dewatering pipe fills to refusal.
- B. Place vent pipes in dewatering pipes as necessary to assist in filling pipe with grout.
- C. No grout shall be placed adjacent to any fill section of the embankment prior to the section being constructed to its full height.
- D. No grout shall be placed prior to Engineer's approval of the embankment construction for the embankment adjacent to the dewatering pipe to be grouted.

3.2 FIELD QUALITY CONTROL

- A. Submit proposed mix design and grouting method to Engineer for review prior to commencement of Work.
- B. Visually inspect grout as it is delivered to site to determine if adequate slump is maintained to allow for grout to be pumped into abandoned dewatering pipe.

END OF SECTION

SECTION 31 05 13

SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Subsoil materials
 - 2. Topsoil materials.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 2. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - 3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Materials Source: Submit name of imported materials source.
- C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 QUALITY ASSURANCE

- A. Furnish each subsoil or topsoil material from single source throughout the Work.

PART 2 PRODUCTS

- A. Random Backfill:
 - 1. Excavated and re-used material.
 - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

3. 40 - 100% passing the #4 screen, 15 - 60% passing the #200 screen.
4. Liquid Limit no greater than 45, Plasticity Index no greater than 20

B. Select Backfill for Canal Lining:

1. Excavated and re-used material, imported borrow, or local borrow of clay soil.
2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
3. The compacted clay backfill for reconstruction of the canal shall consist of inorganic mixtures of clay soil. The material placed shall be classified CL or CH according to the Unified Soil Classification System with a minimum of 60 percent passing the No. 200 sieve. The materials shall be obtained from required excavation of on-site materials, borrow areas, or other sources.

Sieve Size	Mass Percent passing Square Mesh Sieves
2 in	100%
#200	60-100%

2.2 TOPSOIL MATERIALS

A. Topsoil:

1. Excavated and reused material. Unclassified.
2. Graded.
3. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
 - a. Screening: Double screened.

2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Services and Testing and analysis of soil material.
- B. Moisture/Density Relationship Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698.
- C. Moisture/Density Relationship Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698.
- D. When tests indicate materials do not meet specified requirements, change material and retest.
- E. If possible, furnish materials of each type from same source throughout the Work. If not possible, identify potential borrow sources at the beginning of construction to provide sufficient time to evaluate the sources.

PART 3 EXECUTION

3.1 EXCAVATION

- A. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas. Remove all trash, debris, deleterious material, and roots larger than 2-inches.
- B. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.
- C. Remove excavated materials not meeting requirements for subsoil materials and topsoil materials from site.

3.2 STOCKPILING

- A. Stockpile materials on site at locations indicated and designated by Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Prevent intermixing of soil types or contamination.
- E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- F. Stockpile hazardous materials, if they are encountered, on impervious material and cover to prevent erosion and leaching, until disposed of.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Removing surface debris.
 - 2. Removing designated paving, curbs, gutter, and sidewalk.
 - 3. Removing designated trees, shrubs, and other plant life.
 - 4. Removing abandoned utilities.
 - 5. Excavating topsoil.
- B. Related Sections:
 - 1. Section 31 23 23 – Fill

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data for herbicide. Indicate compliance with applicable codes for environmental protection.

1.3 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this project.

1.4 QUALITY ASSURANCE

- A. Conform to code for environmental requirements, disposal of debris, and use of herbicides.
- B. Perform Work in accordance with CDOT and Northglenn standards.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

- B. Verify existing plant life designated to remain is tagged or identified.
 - C. Identify waste area or salvage area for placing removed materials.
- 3.2 PREPARATION
- 1. Call Local Utility Line Information and request underground utilities to be located and marked within and surrounding construction areas before performing Work.
- 3.3 PROTECTION
- A. Locate, identify, and protect utilities indicated to remain, from damage.
 - B. Protect trees, plant growth, and features designated to remain, as final landscaping as specified in Section 01 50 00 - Temporary Facilities and Controls.
 - C. Protect bench marks, survey control points, and existing structures from damage or displacement.
- 3.4 CLEARING
- A. Clear areas required for access to site and execution of Work.
 - B. Remove trees and shrubs indicated. Remove entire stumps
 - C. Clear undergrowth and deadwood, without disturbing subsoil.
 - D. Apply herbicide to remaining stumps to inhibit growth.
- 3.5 REMOVAL
- A. Remove debris, rock, and extracted plant life from site.
 - B. Remove paving, curbs, sidewalks, and utilities where identified on the Drawings.
- 3.6 TOPSOIL EXCAVATION
- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.
 - B. Do not excavate wet topsoil.
 - C. Stockpile material on impervious material (36 mil Hypalon material), until reuse or disposal.
 - D. Remove excess topsoil not intended for reuse, from site.

3.7 SCHEDULES

- A. Remove as identified on the Drawings or as directed by Engineer.

END OF SECTION

SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil densification.
 - 2. Excavating for paving, roads, and parking area drives.
 - 3. Excavating for slabs-on-grade.
 - 4. Excavating for site structures.
 - 5. Excavating for landscaping.
- B. Related Sections:
 - 1. Section 31 05 13 - Soils for Earthwork
 - 2. Section 31 23 23 - Fill.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 3. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
 - 4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - 5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 6. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- B. Local utility standards when working within 24 inches of utility lines.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
- B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with CDOT standards.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

- A. Call Local Utility Line Information service and not less than three working days before performing Work.
- B. Request underground utilities to be located and marked within and surrounding construction areas.
- C. Identify required lines, levels, contours, and datum.
- D. Protect utilities indicated to remain from damage.
- E. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- F. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.2 SOIL DENSIFICATION - VIBRO-COMPACTION

- A. Not applicable to this Project.

3.3 EXCAVATION

- A. Excavate subsoil to accommodate paving and site structures, construction operations, and local traffic
- B. Compact disturbed load bearing soil in direct contact with foundations to at least 95% of maximum density as determined by ASTM D698.
- C. Prepare excavation slopes to meet the excavation projection plan.
- D. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- E. Trim excavation. Remove loose matter.
- F. Remove lumped subsoil, boulders, and rock. Remove larger material as specified in Section 31 23 23.
- G. Notify Engineer of unexpected subsurface conditions.

H. Correct areas over-excavated with structural fill specified in Section 31 23 23 as directed by Engineer.

I. Remove excess and unsuitable material from site.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements & Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Request visual inspection of bearing surfaces by Engineer before installing subsequent work.

3.5 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect exposed surfaces of bottom of excavations, soil adjacent to and beneath foundation, and areas to receive fill from freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 17

TRENCHING, BACKFILLING, AND COMPACTION

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards that may be referenced in this Section
1. City of Northglenn Design and Construction Standards
 2. American National Standards Institute (ANSI) - Z53.1, Safety Color Code
 3. American Public Works Association (APWA) - Uniform Color Code for Temporary Marking of Underground Utility Locations
 4. American Society for Testing and Materials (ASTM)
 - a. ASTM C33 - Standard Specification for Concrete Aggregates
 - b. ASTM C94 - Standard Specification for Ready-Mixed Concrete
 - c. ASTM C117 - Standard Test Method for Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
 - d. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
 - e. ASTM C150 - Standard Specification for Portland cement
 - f. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
 - g. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils
 - h. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³)(600 kN-m/m³)
 - i. ASTM D1140 - Standard Test Methods for Amount of Material in Soils Finer than the No. 200 (75 μm) Sieve
 - j. ASTM D4253 - Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table
 - k. ASTM D4254 - Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

- l. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - m. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
9. American Association of State Highway and Transportation Officials (AASHTO)
- a. AASHTO T180 – Moisture / Density Relations of Soils Using 4.54-kg [10-lb] Rammer and 457-mm [18-in.] Drop
 - b. AASHTO T99 - Moisture-Density Relations of Soils Using a 2.5 kg (5.5 lb) Rammer and a 305 mm (12 inch) Drop

1.02 DEFINITIONS

- A. Base Rock: Granular material upon which manhole bases and other structures are placed.
- B. Bedding Material: Granular material upon which pipes, conduits, cables, or duct banks are placed.
- C. Imported Material: Material obtained by the Contractor from source(s) offsite.
- D. Lift: Loose (uncompacted) layer of material.
- E. Pipe Zone: Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.
- F. Prepared Trench Bottom: Graded trench bottom after stabilization and installation of bedding material.
- G. Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D698. Corrections for oversize material may be applied to either the as-compacted field dry density or the maximum dry density, as determined by the Engineer.
- H. Relative Density: As defined by ASTM D4253 and ASTM D4254.
- I. Selected Backfill Material: Material available onsite that the Engineer determines to be suitable for a specific use.

1.03 SUBMITTALS (SEE SECTION 01300)

- A. Samples:
 1. Trench stabilization material
 2. Bedding and pipe zone material

3. Granular backfill
 4. Earth backfill
- B. Quality Control Submittals: Catalog and manufacturer's data sheets for compaction equipment.
1. Certified Gradation Analysis: Submit not less than 30 days prior to delivery for imported materials or anticipated use for excavated materials, except for trench stabilization material that will be submitted prior to material delivery to site.
 2. Controlled Low Strength Material (Flow Fill): Certified mix design and test results. Include material types and weight per cubic yard for each component of mix.

PART 2 PRODUCTS

2.01 TRENCH STABILIZATION MATERIAL

- A. Base Rock:
1. Clean, hard, durable 3-in minus crushed rock or gravel, or pit run, free from clay balls, other organic materials, or debris.
 2. Clean, washed rock uniformly graded between 1-1/2-in and 2-in.
 3. Clean, washed rock uniformly graded between 1-in and 1-1/2-in.

2.02 BEDDING MATERIAL AND PIPE ZONE MATERIAL

- A. Unfrozen, friable, and no clay balls, roots, or other organic material.
- B. Clean or gravelly sand with less than 5 percent passing No. 200 sieve, as determined in accordance with ASTM D1140.
- C. Conforming to the following limits when tested by means of laboratory sieves:

Sieve Size	Total Passing by Sizes (Percentage by Weight)
3/8-in	100
No. 200	0 - 5

2.03 EARTH BACKFILL

- A. Excavated material suitable for use as backfill that is free from organic material, free from hazardous materials or contaminants, has particle sizes less than 3 inches, and has an in-situ moisture content less than 3 percent above optimum moisture.

2.04 IMPORTED EARTH BACKFILL

- A. Earth Backfill, meeting the following additional requirement:

1. If suitable onsite material is not available then CDOT Class 1 structural backfill or CDOT Class 6 may be used at the direction of the engineer.

2.05 CONTROLLED LOW STRENGTH FILL (Flow Fill or Flash Fill)

- A. Select and proportion ingredients to obtain compressive strength between 50 and 150 psi at 28 days in accordance with ASTM D4832.
- B. Materials:
 1. Cement: ASTM C150, Type I or II
 2. Aggregate: ASTM C33, Size 7
 3. Fly Ash (if used): ASTM C618, Class F
 4. Water: Clean, potable, containing less than 500 ppm of chlorides

2.06 TOPSOIL

- A. Import or use onsite material

2.07 SOURCE QUALITY CONTROL

- A. Perform gradation analysis in accordance with ASTM C136 for:
 1. Earth backfill, including specified class(es)
 2. Trench stabilization material
 3. Bedding and pipe zone material
- B. Certify Laboratory Performance of Mix Designs:
 1. Controlled low strength fill
 2. Concrete

PART 3 EXECUTION

3.01 TRENCH PREPARATION

- A. Water Control:
 1. As specified in Section 02140, Dewatering and Drainage.
 2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.

3. Provide continuous water control until trench backfill is complete.

B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

3.02 TRENCH BOTTOM

A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.

B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify Engineer. Engineer will determine the depth of overexcavation, if any, required.

3.03 TRENCH STABILIZATION MATERIAL INSTALLATION

A. Rebuild trench bottom with trench stabilization material of the type shown on the Drawings.

B. Place material over full width of trench in 6-in lifts to required grade, providing allowance for bedding thickness.

C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.

3.04 BEDDING

A. Place over the full width of the prepared trench bottom in two equal lifts when the required depth exceeds 8-in. Do not allow material to free fall into the trench.

B. Hand grade and compact each lift to provide a firm, unyielding surface.

C. Minimum Bedding Thickness: As follows:

1. As shown in standard detail

D. Check grade and correct irregularities in bedding material. Loosen top 1 to 2-in of compacted bedding material with a rake or by other means to provide a cushion before laying each section of pipe, conduit, direct-buried cable, or duct bank.

E. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.

F. Bell or Coupling Holes: Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

3.05 BACKFILL PIPE ZONE

A. Upper limit of pipe zone shall not be less than following:

1. Pipe: 6-in above top of pipe, unless shown otherwise

- B. Restrain pipe as necessary to prevent movement during backfill operations.
- C. Minimum difference between 2 or more buried items installed in the same trench: 12-in minimum; 18-in maximum.
- D. Place material simultaneously in lifts on both sides of pipe, conduit, cables, and duct banks, and, if applicable, between items installed in same trench.
 - 1. Pipes: 6-in lifts
- E. Pipes 16-in and smaller in diameter,:
 - 1. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by "walking in" and slicing material under haunches with a shovel to ensure that voids are completely filled before placing each succeeding lift. Prevent pipe flotation.
 - 2. Do not cut or damage the outer pipe coating. If non-metallic pipe is damaged, replace it.
 - 3. Compact bedding and pipe zone material with a hand-operated, vibratory device to a minimum density of 95% optimum density determined by ASTM D-698. Special precautions shall be taken to prevent flotation of the pipe.
 - 4. Do not use power-driven impact compactors to compact pipe zone material.

3.06 BACKFILL ABOVE PIPE ZONE

- A. General:
 - 1. Process excavated material to meet specified gradation requirements, or use imported material, if excavated material is not suitable.
 - 2. Adjust moisture content as necessary to obtain specified compaction.
 - 3. Do not allow backfill to free fall into the trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2-ft of backfill has been provided over the top of pipe.
 - 4. Do not use power driven impact type compactors for compaction until at least 1-ft of backfill is placed over top of pipe.
 - 5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.
 - 6. Backfill around structures with same class backfill as specified for adjacent trench unless otherwise shown or specified.
- B. Controlled Low Strength Fill (Flow Fill):

1. Discharge from truck mounted drum type mixer into trench.
2. Place in lifts as necessary to prevent uplift (flotation) of new and existing facilities.

3.07 COMPACTION TESTING

- A. The compaction the backfill shall be tested at a rate of at least five (5) tests per 500 feet of trench or as directed by the Engineer. The testing shall be at varying depths and locations as determined by the Engineer. Testing shall be performed around each manhole and valve boxes.

3.08 REPLACEMENT OF TOPSOIL

- A. Replace topsoil in top 6-in of backfilled trench.
- B. Maintain the finished grade of topsoil even with adjacent area and grade as necessary to restore drainage.

3.09 MAINTENANCE OF TRENCH BACKFILL

- A. After each section of trench is backfilled, maintain the surface of the backfilled trench even with the adjacent ground surface until final surface restoration is completed.
- B. Topsoil: Add topsoil where applicable and as necessary to maintain the surface of the backfilled trench level with the adjacent ground surface.
- C. Other Areas: Add excavated material where applicable and keep the surface of the backfilled trench level with the adjacent ground surface.

END OF SECTION

SECTION 31 25 13
EROSION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Inlet Protection Systems
 - 2. Curb Socks
 - 3. Portable Concrete Washout Systems

- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 30 00 - Cast-In-Place Concrete.
 - 3. Section 31 05 13 - Soils for Earthwork.
 - 4. Section 31 10 00 - Site Clearing.
 - 5. Section 31 23 16 - Excavation.
 - 6. Section 31 23 23 - Fill.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T88 - Standard Specification for Particle Size Analysis of Soils.
 - 2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

- B. ASTM International:
 - 1. ASTM C127 - Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
 - 2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - 3. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - 4. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

- B. Product Data: Product Data: Submit data on erosion control products.

- C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Not applicable to this Project.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Northglenn standards.

1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing work of this section.

PART 2 PRODUCTS

2.1 INLET PROTECTION MATERIALS

- A. Furnish materials in accordance with City of Northglenn and CDOT standards.
- B. Per the drawings.

2.2 CURB SOCK MATERIALS

- A. Furnish materials in accordance with City of Northglenn and CDOT standards.
- B. Per the drawings.

2.3 PORTABLE CONCRETE WASHOUT SYSTEM

- A. Furnish materials in accordance with City of Northglenn and CDOT standards.
- B. Per the drawings.

2.4 SOURCE QUALITY CONTROL (AND TESTS)

- A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of existing conditions before starting work.
- B. Verify compacted subgrade is acceptable and ready to support devices and imposed loads.

- C. Verify gradients and elevations of base or foundation for other work are correct.
- 3.2 INLET PROTECTION MATERIALS
- A. Install Work per the drawings.
 - B. Install Work in accordance with City of Northglenn and CDOT standards.
- 3.3 CURB SOCK MATERIALS
- A. Install Work per the drawings.
 - B. Install Work in accordance with City of Northglenn and CDOT standards.
- 3.4 PORTABLE CONCRETE WASHOUT SYSTEMS
- A. Install Work per the drawings.
 - B. Install Work in accordance with City of Northglenn and CDOT standards.
- 3.5 SITE STABILIZATION
- A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.
 - B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
 - C. Stockpile and waste pile heights shall not exceed 35 feet. Slope stockpile sides at 2: 1 or flatter.
 - D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than the allowable days per Northglenn Standards.
 - 1. During non-germinating periods, apply mulch at recommended rates.
- 3.6 FIELD QUALITY CONTROL
- A. Section 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
 - B. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.
- 3.7 CLEANING
- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

- B. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.
- C. Do not damage structure or device during cleaning operations.
- D. Do not permit sediment to erode into construction or site areas or natural waterways.
- E. Clean channels when depth of sediment reaches approximately one half channel depth.

3.8 PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- C. Do not permit construction traffic over paving for 7 days minimum after finishing or until 75 percent design strength of concrete has been achieved.
- D. Protect paving from elements, flowing water, or other disturbance until curing is completed.

END OF SECTION

SECTION 32 92 19

OPEN SPACE REVEGETATION

Reseeding Required for Open Space Area

1.01 SEED TYPES

Seed Mix - Perennial Cover

<u>Species</u>	<u>Common Name - Variety</u>	<u>Rate-PLS lb/ac*</u>
<i>GRASSES</i>		
<i>Bouteloua curtipendula</i>	Sideoats Grama	6.80
<i>Bouteloua gracilis</i>	Blue grama - Alma or native	12.40
<i>Buchloe dactyloides</i>	Buffalograss - Native	18.00
<i>Calamovilfa longifolia</i>	Prairie Sandreed	6.20
<i>Schizachyrium scoparium</i>	Little Bluestem	4.80
<i>Sporobolus airoides</i>	Alkali Sacaton-Native	0.80

* Rate for drill seeding; PLS = PURE LIVE SEED (Bulk rate =PLS rate/(% purity x % germination).
Regreen or similar approved 1-year annual cover crop must be added at 50 lbs./acre.

1.02 SEEDING RATE

Seeding shall be done at a rate of 49 PLS lb/ac.

1.03 PURITY

Grass seed specified will conform with all current state regulations regarding weed seed content and will meet the required pure live seed content as adjusted for batch purity and germination.

1.04 SOIL AMENDMENTS (NOT USED)

1.05 MULCH

Mulch is required to conserve moisture, prevent crusting, reduce runoff and erosion and help establish a plant cover. The need for mulch will be at the sole discretion of the City of Northglenn. Mulching material shall be applied immediately or immediately after seeding. One of the mulching methods listed below will be acceptable:

- A. Areas under one acre: application of hydro-mulch (wood fibers in a water slurry) -- minimum rate of 2,000 lbs/acre. A guar-based tackifier, shall be included in the hydro-mulch.
- B. Areas over one acre: grain straw shall be used at an application rate of 4,000 lbs/acre of air dried material. At least 50-percent of the mulch by weight shall be 10 inches or more in length. Mulch shall be anchored immediately after distributing with a mulch crimper, and tackifier.

1.06 GRADING / SEEDBED PREPARATION

In general, graded areas will match the undisturbed surface elevations ensuring positive drainage. In areas of pipeline installation grades over the pipe itself may be slightly elevated where the project engineer may believe that settling is likely to occur. Upon establishment of approved grades, the soil surface shall be loosened by rototilling to a minimum of 8 inches, and all materials over 2 inches in diameter shall be removed. The surface shall then be finish-graded and compacted to the approved elevations. Seedbed preparation shall be approved by the City of Northglenn prior to the installation of seed.

1.07 SEEDING

Dry land seeding, sometimes referred to as “native” seeding, shall be accomplished with mechanical power-drawn drills which have depth bands set to maintain a planting depth between ¼ inch and ½ inch and shall be set to space the rows not more than 2 inches apart. In addition the drill will be equipped with multiple seed boxes from which large smooth, small smooth, and appendaged (i.e. fluffy or trashy) seed can be metered evenly. Seed that is extremely small shall be sowed from a separate hopper adjusted to the proper rate of application. When requested by the contractor and approved by the City, seeding may be accomplished by means of approved broadcast or hydraulic-type seeders. Seed shall not be drilled or sown during windy weather or when the ground is frozen or otherwise untillable.

All seed sown by broadcast-type seeders shall be “raked in” or otherwise covered with soil to a depth of at least 1/4-inch. Hand method of broadcasting seed will be permitted only on small areas not accessible to machine methods. If inspections indicate that strips wider than the specified space between the rows planted have been left or other areas skipped, the City may require immediate resowing of seed in such areas at the Contractor’s expense.

During all seeding operations, proper functioning of the seed drill will be demonstrated to the satisfaction of the City of Northglenn upon request.

1.08 IRRIGATION – NOT USED

1.09 WEED MANAGEMENT

In the two years following seeding, seeded areas will be monitored to assess the presence of serious weeds that require eradication or other treatment. Manual control will be undertaken where species and circumstances allow. However, chemical treatment may become necessary in some areas, to be determined by the City of Northglenn.

1.10 ACCEPTANCE

Acceptance of the seeding shall be per the Terms and Conditions of this License Agreement. A minimum of 80% coverage will be required, with no visible bare spots.

END OF SECTION