PROJECT MANUAL

Bidding Requirements, Contract Conditions
of the Contract and Specifications

LAYTON CITY PROJECT 22-1:

ADAMS CANYON TRAILHEAD

450 N. Eastside Dr., Layton, Utah

Owner:
Layton City Corporation
465 North Wasatch Drive
Layton, Utah 84041

Think Architecture
Curtis Tanner, PLA, ASLA
801-269-0055

January 10, 2023

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SECTION 00 010
INVITATION TO BIDDERS

Sealed bids will be accepted until 1:00 p.m. February 7, 2023, in the office of Layton City Parks and Recreation, 465 N Wasatch Drive, Layton, UT 84041 at which time they will be opened for the following project:

LAYTON CITY:

ADAMS CANYON TRAILHEAD, Project 22-1
450 N. Eastside Dr., Layton, Utah

Bids will be received for site improvements of the Adams Canyon Trailhead as delineated in the drawings. Major work items will include the following work: Prepare site for the installation of a CXT restroom and drinking fountain; install concrete pathways; construct kiosk; install benches, bike rack, bike repair stand and landscaping improvements. Limit site work as shown in the drawings.

Project bidding documents are available at www.questcdn.com (Quest project #8369405) or https://qcpi.questcdn.com/cdn/posting/?group=3971843&provider=3971843. Documents may be viewed online until prequalification requirements are met after which the documents may be downloaded for $30.00. Please contact the Project Manager at 801-336-3926 if you have any questions.

Contractors shall submit the Contractor's Qualification Statement available at the questcdn.com website, under the Q & A section, to be reviewed by the OWNER prior to 12:00 p.m. January 31, 2023. Upon Layton City approval, contractors will be given a password to purchase and download the bid documents. Layton City reserves the right to approve or deny bidders based upon similar project experience. Contractor's Qualification Statements shall be emailed to jgrandy@laytoncity.org or received in writing by 12:00 p.m. on January 31, 2023 in the Layton City Parks and Recreation Department located at 465 North Wasatch Drive, Layton UT 84041.

Bidders will be required to furnish a 5% bid bond. Bids will be accepted until 1:00 p.m February 7, 2023. At which time they will be opened and read aloud.

The documents required at bid opening are as follows:

1) Bid forms provided.
2) Cashier or certified check or bid bond made payable to Layton City in an amount equal to at least five percent (5%) of the total bid.
3) Copy of state license.
4) Anticipated schedule (include start and finish dates)

The successful bidder will be required to submit to Layton City a Labor and Materials Payment Bond and a Performance Bond both in the amount of 100% of the total amount of the bid prior to the execution of any contract documents.

Layton City reserves the right to accept or reject any or all bids or any part of any bid and to waive any informalities in any bid as its best interest appear. A decision on the rejection of any or all bids, or Notice of Award will be made within (45) calendar days after the bid opening.

Layton City Corporation

END OF SECTION 00 010

SECTION 00 020
INSTRUCTIONS TO BIDDERS

DEFINITIONS

Addenda are written or graphic instructions issued by the Project Manager prior to the execution of the bid contracts, which modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections. Addenda shall become part of the Contract Documents and shall be included in any bid proposal.

Bid is a complete and properly signed proposal to do the work, or designated portion thereof, for the sums stipulated therein, supported by data called for by the Bidding Documents, including the Addenda.

Unit Price, if required, is an amount stated in the bid (or Change Order) as a price per unit of measurement for materials and services.

Contractor is the bidder who enters into a prime contract with the City of Layton for the work described in the Contract Documents.

City, Owner, or Project Manager are terms synonymous with the City of Layton, Utah.

BIDDING DOCUMENTS

Complete sets of Bidding Documents shall be used in preparing bids; the Project Manager and the City of Layton assume no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents, or omissions resulting from bids prepared from partial sets based upon assumed trade jurisdiction. The Project Manager will not issue partial sets of Drawings and Specifications. Bidding Documents will be issued to each bidder at www.questcdn.com (Quest project #8369405) or https://qcpi.questcdn.com/cdn/posting/?group=3971843&provider=3971843.

EXAMINATION OF DOCUMENTS AND SITE

Each bidder, by making a bid, represents that s/he has read and understands the Bidding Documents and that s/he has visited the site to obtain first hand knowledge of existing local conditions under which the work is to be performed. Bidders will not be given extra payments for conditions which can be determined by examination of the Documents and the site. The submission of a bid shall be construed evidence that the bidder has made such examinations.

WITHDRAWAL OF BIDS

Any bidder may withdraw his/her bid, either personally or by written request, at any time prior to the scheduled time for opening of bids.

No bidder may withdraw his/her bid for a period of 45 days after the date set for the opening thereof, and all bids shall be subject to acceptance by Layton City during this period.

END OF SECTION 00 020

SECTION 00 030
ADDENDA AND MODIFICATIONS

Substitution of Products for Consideration During Bidding

Reference in the Specifications or on the Drawings to any material, product, article, or piece of equipment by manufacturer's name, model, catalog number, or the like, shall not be construed as limiting competition unless otherwise noted.

Bidders shall base their bids upon the use of the products, manufacturers, or methods specifically specified herein. Any requests for changes or substitutions will be considered no later than seven (7) days prior to bid date, and only written approvals received prior to bid date are acceptable. Any other changes or substitutions without prior written review shall be subject to rejection and no Contract Amount adjustments shall be warranted.

If a bid is based upon the use of substituted items other than those specifically named in the Bid Documents, it shall be the responsibility of the Bidder submitting the proposal to fully satisfy the Project Manager and the Owner that the items meet the requirements of the Contract Documents. Substituted items (not receiving prior favorable review) incorporated into the work shall be removed as directed by the owner and/or the Project Manager and the new work shall be installed using specified items.

Requests for substitutions shall be directed, in writing, to:

Layton City Parks and Recreation
JoEllen Grandy
465 N Wasatch Drive
Layton, UT 84041
jgrandy@laytoncity.org

Accompany requests for substitutions with complete data substantiating compliance of proposed substitution with contract Documents, including product identification and description, reference standards, performance and test data, and samples, where applicable and an itemized comparison on the proposed substitution with products and methods specified with data relation to changes in construction contracts. Include accurate cost data on proposed substitution designation of any known detrimental aspects of substitution such as danger to installer or user, if applicable.

All requests for substitutions shall be made through the Project Manager. Contractor shall stamp and sign request certifying substituted item is equal to specified item. Any request for a substitution must include all costs associated with related work (i.e. Structural, Architectural, Mechanical, and Electrical). This would include any design fees and all costs associated with work required by others to complete the substitution.

By making request for substitution, the Contractor represents that:

1. The Contractor has personally investigated proposed product or method and determined that it is equal or superior in all respects to that specified.

2. The Contractor will provide the same guarantee for the substitution as for the product or method specified.

3. The Contractor will coordinate installation of accepted substitution into the work, making such changes as required for work to be completed in all respects.

Interpretation or correction of Bidding Documents

Bidders shall promptly notify the Project Manager of any ambiguity, inconsistency, or error which they may discover upon examination of the Bidding Documents or of the site and local conditions. Bidders requiring a clarification or interpretation of the Bidding Documents shall make a written request to reach the Project Manager no Later than seven (7) days prior to the bid date.

Any interpretation, correction, or change to the Bidding Documents will be made by Addendum. Interpretations, corrections, substitutions or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections, and changes, especially any verbal directives given by the City Engineer office personnel, or the Owner's personnel.

Addenda

If any Bidder is in doubt as to the true meaning of any part of the Drawings and Specifications, the Bidder shall submit to the Project Manager a written request for interpretation of correction of the Contract Documents. Such request shall be made no later than seven (7) days prior to bid. Any written interpretation or correction will be made by written addendum. All oral communication with the Project Manager, staff and consultants, and the Owner shall have no force to alter the Contract Documents.

Each Bidder shall look for Addenda prior to submitting a bid. The bid shall acknowledge the receipt of any Addenda.

Modifications

After execution of the Agreement Between Construction Manager and Contractor, no modification may be made to the Contract except in writing by Supplemental Instruction of Change Order. Verbal directive shall have no force except it they are followed up in writing.

END OF SECTION 00 030

SECTION 00 040
BID FORM

Project: Layton City Adams Canyon Trailhead, Project 22-1
- Adams Canyon Trailhead – 450 N. Eastside Drive Layton, UT – Improvements

Submitted to: Layton City Corporation
Parks and Recreation Department
465 N Wasatch Drive
Layton, UT 84041

PROPOSAL OF _____ (hereinafter called "BIDDER"), organized and existing under the laws of the STATE OF UTAH, doing business as _____.**(Insert "a corporation", "a partnership", "an individual") To the city of Layton (hereinafter called "OWNER").

In compliance with your advertisement for bids, the undersigned Bidder proposes and agrees to enter into an agreement with the City to perform and furnish all work as specified or indicated for the construction of the LAYTON CITY ADAMS CANYON TRAILHEAD, Project 22-1 – 450 N. Eastside Drive in strict accordance with the contract documents, within time set forth therein, and at the prices stated below.

By submission of this bid, the bidder, including all bidders in a joint bid, certifies 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 competitor.

Bidder accepts all of the terms and conditions of Invitation to Bid and Instructions to Bidder, including without limitation those dealing with the disposition of Bid Security. This bid will remain subject to acceptance for forty-five (45) consecutive calendar days after the day of Bid opening. Bidder will sign and deliver the required number of counterparts of the Agreement with the Bonds and other documents required by the Bidding Requirements, within ten (10) days after the date of Owner's Notice of Award.

In submitting this Bid, Bidder represents that:

Bidder has examined and carefully studied the Bidding Documents and the following Addenda receipt of which is hereby acknowledged:

Addenda Number	Addendum Date

Bidder has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, performance and furnishing of the Work.

Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

Bidder is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.

Bidder acknowledges Layton City reserves the right to accept or reject any or all bids or any part of any bid and to waive any informalities in any bid as its best interest appear. A decision on the rejection of any or all bids, or Notice of Award will be made within (45) calendar days after the bid opening.

Bidder has correlated the information known to Bidder, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

Bidder has given Project Manager written notice of all conflicts, errors, ambiguities or discrepancies that the Bidder has discovered in the Contract Documents and the written resolution thereof by Project Manager is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

This bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid. Bidder has not solicited or induced any person, firm or corporation to refrain from bidding. Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID

For all work shown on the Drawings and described in the Specifications. I/We agree to perform the work for the sum of:

_____DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATES:

For your consideration, we further propose the following ALTERNATES as listed in the drawings.

BID ALTERNATE #1: None.

_____DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

BASE BID: Unit Price Breakdown PROJECT 22-1

Layton City Adams Canyon Trailhead, Project 22-1:

Adams Canyon Trailhead - 450 N. Eastside Drive

BASE BID					
Item No.	Items Written in Words	Qty	Unit	Amount	
				Dollars	Cents
1	Mobilization / General Conditions	1	LS		
2	Construction Surveying & Staking	1	LS		
3	Traffic Control / Construction Fencing	1	LS		
4	Testing (Concrete / Compaction)	1	LS		
5	Erosion Control Elements & Protection	1	LS		
6	Clear & Grub Site	1	LS		
7	Earthwork & Grading	1	LS		
8	Concrete Paving	1	LS		
9	Restroom Facility (See Note #1 Below)	1	LS		
10	Kiosk and Related Appurtenances	1	LS		
11	Drinking Fountain + Installation	1	LS		
12	Water & Sewer Connections to Drinking Fountain	1	LS		
13	Benches	1	LS		
14	Bike Rack & Bike Repair Stand	1	LS		
15	Landscape Irrigation System & Related Appurtenances	1	LS		
16	Fine Grading	1	LS		
17	Landscaping	1	LS		
Adams Canyon Trailhead Total Base Bid:					

*** NOTE #1**: Restroom Facility as noted in plans is to be furnished by City and Installed by CXT. Contractor is responsible to prepare the pad for the restroom and to have all utilities stubbed up ready for hook-up upon arrival of the restroom. Owner will coordinate with CXT in purchasing the restroom and notify the Contractor of the timeline as to when the restroom will be delivered and ready for placement.

Bidder guarantees to complete all other work within 120 calendar days after receipt of Notice to Proceed. Bidder accepts the provisions of the Agreement as to liquidated damages in the amount of $250 per calendar day.

Bidder further proposes to (1) execute a contract with Layton City Corporation promptly after request from the Project Manager, (2) begin the work within seventy-two hours after notified to do so by the Project Manager, and (3) complete the work in accordance with the provisions of said contract.

The undersigned also propose to furnish Performance and Labor and Material Payment Bonds with the contract, signed by a surety company, in amounts equal to the amount of the contract conditioned to insure that the terms of the contract and the requirements of the specifications will be fully complied with.

The following is the name and place of business of the surety company which the bidder proposes will sign the attached bonds as surety if said surety is acceptable to the Project Manager.

If the bidder is a corporation, the following information must be given:

State Chartered under_____ Name_____

_____
Name of President

_____
Name of Secretary

_____
Name of Treasurer

If the bidder is a partnership, the name of each partner must be listed below:

_____

_____

By:_____

Title:_____

END OF SECTION 00 040

SECTION 00 050
BID BOND

Know All Men by These Presents,

That_____as Principal, and _____
as_____, a corporation duly organized under the laws of the state of _____ and licensed to transact business in the State of Utah, as Surety, (hereinafter called the "surety") are held and firmly bound unto Layton City Corporation (hereinafter called "Project Manager") in the sum of:

_____Dollars,
(5% of the total amount of the bid)

for the payment sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly, and severally, firmly by these presents.

WHEREAS said Principal has submitted a bid to said Project Manager to perform all work required under the bidding schedule(s) of the Contract Documents entitled **Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah.**

NOW THEREFORE, if said Principal is awarded a contract by said Project Manager and, within the time and in a manner required in the Proposal enters into a written contract form attached to said Construction Documents, furnishes the required certificates of insurance, and furnishes the required Performance Bond and Payment Bond with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and materials furnished in the prosecution thereof, all within ten (10) calendar days after receipt of contract from said Project Manager, then this obligation shall be null and void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by said Project Manager and judgment is recovered, said Surety shall pay, in addition to the amount of this bond, all costs incurred by Said Project Manager in such suit, including a reasonable attorney's fee to be fixed by the Court.

SIGNED AND SEALED, this _____day of_____,20____

_____(Seal)_____
(Principal) (Surety)

By:_____By:_____
(Signature) (Signature)

(Seal and Notarial Acknowledgement of Surety)

END OF SECTION 00 050

SECTION 00 060
NOTICE OF AWARD

To: _____
_____
_____

PROJECT Description: Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah.

You are hereby notified that your bid has been reviewed by City Council and has been accepted for items in the amount of $_____.

You are required by the invitation for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Labor and Material Payment BOND and certificates of insurance within ten (10) calendar days from the date of this notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____day of _____, 20___.

By: _____
Title: David R. Price, Parks & Recreation Director____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by:_____

this the _____ day of _____, 20_____

By: _____

Title: _____

END OF SECTION 00 060

SECTION 00 070

AGREEMENT

This AGREEMENT, made this _____day of _____, 20___, by and between LAYTON CITY CORPORATION, hereinafter called "OWNER" and _____, doing business as a CORPORATION hereinafter called "CONTRACTOR".

"WITNESSETH" That for and in consideration of the payments and agreements hereinafter mentioned.

1. The CONTRACTOR will commence and complete the CONSTRUCTION OF **: Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah.**
2. The 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.
3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within 10 calendar days after the date of the NOTICE TO PROCEED and will complete the work within 120 calendar days, unless the period for beginning or completion is extended otherwise by the CONTRACT DOCUMENTS. Bidder further agrees to pay as liquidated damages, the sum of two hundred fifty dollars ($250) for each consecutive calendar day after the completion date unless the period for beginning or completion is extended otherwise by the CONTRACT DOCUMENTS.
4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum shown in the bid schedule.
5. The term "CONTRACT DOCUMENTS" means and includes the following:
   - (A) INVITATION TO BIDDERS
   - (B) INSTRUCTIONS TO BIDDERS
   - (C) ADDENDA AND MODIFICATIONS
   - (D) BID FORM
   - (E) BID BOND
   - (F) NOTICE OF AWARD
   - (G) AGREEMENT
   - (H) LABOR AND MATERIAL PAYMENT BOND
   - (I) PERFORMANCE BOND
   - (J) NOTICE TO PROCEED
   - (K) CHANGE ORDER(S)
   - (L) GENERAL CONDITIONS AND SUPPLEMENTAL GENERAL CONDITIONS
   - (M) DRAWINGS
   - (N) SPECIFICATIONS
   - (O) ADDENDA

     No._____, dated _____,20___

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions and Contract Documents, such amounts as required by the CONTRACT DOCUMENTS.

7. These Agreements shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns. IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized official, this Agreement in four copies, each of which shall be deemed an original on the date first above written.

OWNER: LAYTON CITY CORPORATION

BY: _____

(SEAL) NAME: ALEX JENSEN

TITLE: CITY MANAGER

ATTEST:

BY: _____

NAME: KIMBERLY S READ

TITLE: CITY RECORDER

CONTRACTOR:

BY: _____

(SEAL) NAME: _____

TITLE: _____

ATTEST:

BY: _____

NAME: _____

TITLE: _____

STATE OF _____

COUNTY OF _____

On this _____ day of _____, 20___, personally appeared before me _____ _____, who is the _____ of _____, and that the document was signed in behalf of said corporation, and _____ acknowledged to me that said corporation executed the same.

_____

NOTARY PUBLIC

ATTEST:

BY: _____

NAME: _____

TITLE: _____

END OF SECTION 00 070

SECTION 00 080
LABOR AND MATERIAL PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS,

That _____as principal, hereinafter called the contractor, and _____a corporation organized under the laws of the State of _____ _____, and licensed to transact business in the State of Utah as surety, hereinafter called Surety, are held firmly bound unto Layton City (hereinafter called "Owner" and/or "Project Manager") and _____ _____ (hereinafter called the Construction Manager) in the amount of _____ _____dollars, for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly, and severally, firmly by these presents.

WHEREAS, said Contractor has been awarded and is about to enter into the annexed contract (the "Contractor") to perform all work required under bidding schedule(s)_____of the **Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah** which contract is by this reference made part hereof.

NOW THEREFORE, if said Contractor, or subcontractor, failed to pay for any materials, equipment, or other supplies, or for rental of same, used in connection with the performance of work contracted to be done, or for amounts due under applicable State law for any work or labor thereon, said Surety will pay for the same in an amount not exceeding the sum specified above, and, in the event suit is brought upon this bond, reasonable attorneys fees. This bond and any persons, companies, or corporations entitled to file claims under applicable State Law.

PROVIDED, that any alterations in the work to be done or the materials to be furnished, or changes in the time of completion, which may be made pursuant to the terms of said contract, shall not in any way release said Contractor or said Surety thereunder, nor shall any extensions of time granted under the provisions of said contract release either said Contractor or said Surety, and notice of such alterations or extensions of the contract is hereby waived by said Surety.

SIGNED AND SEALED, this _____day of _____20____.

_____(Seal)_____(Seal)

By:_____ By:_____
(Signature) (Signature)

(Seal and Notarial Acknowledgement of Surety)

END OF SECTION 00 080

SECTION 00 090
PERFORMANCE BOND

Know all persons by these presents,

That _____ as Contractor and _____ a corporation duly organized under the laws of the State of _____ and licensed to transact business in the State of Utah as Surety, hereinafter called the Surety, are held firmly bound unto Layton City (hereinafter called "Owner") in the sum of _____ dollars, and their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Said Contractor has been awarded and is about to enter into the annexed contract with said Owner to perform all work required under the biding schedule(s)_____ of the **Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah** Contract is by reference made a part hereof and is hereinafter referred to as the "Contract".

NOW THEREFORE, if said Contractor shall perform all the requirements of said contract required to be performed on his part, at the times and in the manner specified therein, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

PROVIDED, that any alterations in the work to be done or the materials to be furnished, or changes in the time or completion, which may be made pursuant to the terms of said contractor, shall not in any way release said Contractor or said surety thereunder, nor shall any extensions of time granted under the provisions of said contract release either said Contractor of said Surety and notice of such alterations or extension of the contract is waived by said Surety.

SIGNED AND SEALED, this _____ day of _____, 20__.

_____ _____
(Contractor) (Surety)

By:_____ By:_____
(Signature) (Signature)

(Seal and Notarial Acknowledgement of Surety)

END OF SECTION 00 090

SECTION 00 100
NOTICE TO PROCEED

To: _____
_____
_____

PROJECT Description: Site Development work for **Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah**

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 ____ _____ consecutive days thereafter. The date of completion of all work is therefore _____ _____, 20___.

You are further notified that if the work does not begin within ten (10) days following the Notice to proceed date, the City will consider the contract breached and proceed with legal action against the Contractor and the bonding company OR the City will access the liquidated damages for each day until the project begins.

By: _____

Title: _____

_____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____ _____

This the _____day of _____, 20___.

By: _____

Title: _____

END OF SECTION 00 100

SECTION 00 110
CHANGE ORDER

Order No._____.

Date:_____.

Agreement Date:_____.

NAME OF PROJECT:____Layton City Adams Canyon Trailhead, Project 22-1 - 450 N. Eastside Drive _____, Layton UT

OWNER: LAYTON CITY CORPORATION

CONTRACTOR:_____

The Following changes are hereby made to the CONTRACT DOCUMENTS

Justification:_____

Change to CONTRACT PRICE:_____

Original CONTRACT PRICE: $_____

Current CONTRACT PRICE adjusted by previous CHANGE ORDER: $_____

The CONTRACT PRICE due to this CHANGE ORDER will be (increased)(decreased) by:
$_____

The new CONTRACT PRICE including this CHANGE ORDER will be: $_____

Change to CONTRACT TIME:_____

The CONTRACT TIME will be (increased)(decreased) by _____ calendar days.

The Date for completion of all work will be _____(date)

Approvals Required:

Approved by:_____ (Contractor)

Approved by:_____ Engineer/Project Manager)

Approved by:_____ (Owner)

Approved by:_____

END OF SECTION 00 110

Section 01 010
SUMMARY OF WORK

GENERAL – PART 1

1.1 SUMMARY

A. Project Identification:

Layton City Project:
Layton City Adams Canyon Trailhead, Project 22-1 – 450 N. Eastside Drive Layton, Utah

B. Project summary:

- Major work items will include the following work: Prepare site for the installation of a CXT restroom and drinking fountain; install concrete pathways; construct kiosk; install benches, bike rack, bike repair stand and landscaping improvements. Limit site work as shown in the drawings.

C. Permits:

Apply for, and obtain permits required for the work.

D. Codes:

Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communication to city.

E. Dimensions:

Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials.

F. Existing Conditions:

Notify City of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.

G. Definition of terms used in specifications:

1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.

H. Intent:

Drawing and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the City. Anything not expressly set forth by which is reasonably implied or necessary for proper performance of the project shall be included.

I. Writing style:

Specifications are written in the imperative mode. Except for where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, 'Provide sod' means 'Contractor shall provide sod'.

END OF SECTION 01 010

SECTION 01 025
MEASUREMENT & PAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Administrative and procedural requirements governing Contractor's Application for Payment.

B. Related Sections
   1. Section 01 300, Submittals – Contractor's Construction Schedule and Submittal Schedule

1.2 SCHEDULE OF VALUES

A. Submit schedule of dollar values to Project Manager not less than 20 calendar days prior to first request for payment as a condition precedent to processing first payment. Coordinate preparation of Schedule of Values with preparation of Contractor's Construction Schedule. Correlate line items in Schedule of Values with other required administrative schedules and forms, including –
   1. Contractor's construction schedule.
   2. Payment Request forms.
   3. List of subcontractors and principle suppliers and fabricators.
   4. Schedule of allowances.
   5. Schedule of alternates.
   6. Schedule of submittals.

B. Format and Content – Submit Schedule of Values on owner's standard payment request form. The break down shall include pro rata part of overhead and profit for each line item so sum of items will equal contract price. Breakdown shall correspond to items in construction schedule including work of Subcontractors.

1.3 APPLICATION FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Project Manager and paid by Owner. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involves additional requirements specified below.

B. At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the City a partial payment estimate filled out and signed by the Contractor covering the Work performed during the period covered by the partial payment estimate and supported by such data as the City may reasonably require.

   .

   1. If payment is requested on the basis of materials and equipment not incorporated into the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the City, as will establish the City's title to the material and equipment and protect City's interest therein, including applicable insurance.
   2. The City will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing approval of payment, or return the partial payment estimate to the Contractor indicating in writing the City's reason for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment.

3. The City will within ten (10) days of presentation to the Owner of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate.
4. The City shall **retain 5%** (five percent) [Utah Law UCA 13-8-5 (3) (a) @ July 1, 1999] of the amount of each payment until final completion and acceptance of all Work covered by the Contract Documents.
5. When the Work is substantially complete (operational or beneficial occupancy), the retained amount may be further reduce below 5% (five percent) to only that amount to assure completion.

C. Upon completion and acceptance of the Work, the City shall issue a certificate attached to the final payment request that the Work has been accepted by the City under the conditions of the Contract Documents. The entire balance found to be due to the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the City, shall be paid to the Contractor within thirty (30) days of completion and acceptance of the Work.

D. The Contractor will indemnify and hold the City or the City's agents and employees harmless from the claims growing out of the lawful demands of Subcontractors, laborers, workers, mechanics, materialism, and finisher (s) of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the Work.

E. The Contractor shall, at the City's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so, the City may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims, until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor may be resumed, in accordance with the Contract documents. But in no event shall the provisions of this section be construed to impose any obligations upon the City, to either the Contractor, contractor's Surety, or the third party. In paying any unpaid bills of the Contractor, any payment so made by the City shall be considered as a payment made under the Contract Documents by the City to the Contractor and the City shall not be liable to the Contractor for any such payments made in good faith.

F. Transmittal – Submit one executed original of each Payment request Form to Project Manager. Include waivers of lien and similar attachments, when required. Transmit each copy with transmittal form listing attachments, and recording appropriate information related to application in a manner acceptable to Project Manager.

G. Initial Application For Payment – Administrative actions and submittals that shall precede or coincide with submittal of first Application for Payment include the following –
1. List of subcontractors and principle suppliers and fabricators.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary in not final).
4. Schedule of unit prices.
5. Submittal Schedule (preliminary if not final).
6. Copies of building permits.
7. Copies of authorizations and licenses from governing authorities for performance of the Work.
8. Initial progress report.
9. Minutes of pre-construction meeting.

H. Payment Request At Substantial Completion – Following issuance of Certificate of Substantial Completion, submit a Payment Request. Administrative actions and submittals that shall precede or coincide with this application include (if applicable) –
1. Occupancy permit and similar approvals.
2. Meter readings.

3. Operation & Maintenance Manuals.
4. Change over information related to Owner's occupancy, use, operation and maintenance.
5. Final cleaning.
6. Application for reduction of retainage, and consent of surety.

I. Final Payment Request – Administrative actions and submittals that shall precede or coincide with Payment Request include the following (if applicable) –

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Assurance that unsettled claims will be settled.
4. Assurance that Work not and accepted will be completed without undue delay.
5. Transmittal of required Project construction records to Owner.
6. Proof that taxes, fees and similar obligations have been paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.

1.4 ACCEPTANCE OF FINAL PAYMENT AS RELEASE

A. The acceptance by the Contractor of final payment shall be and shall operate as a release to the City of all claims and all liability to the Contactor other than claims in stated amounts as may be specifically accepted by the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the City and others relating to or arising out of this Work.

B. Any payment, however, final or otherwise, shall not release the Contractor or Contractor's Sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bonds.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 025

SECTION 01 035
MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections
   1. Section 01 020, Allowances – Procedural requirements governing handling and processing allowances.
   2. Section 01 025, Measurement & Payment –
      a. Administrative procedures governing application for payment.
      b. Administrative requirements governing use of unit prices.
   3. Section 01 300, Submittals – Requirements for Contractor's Construction Schedule.
   4. Section 01 600, Materials and Equipment – Administrative procedures for handling request for substitutions made after award of Contract.

1.2 MINOR CHANGES IN THE WORK

A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to Contract Sum or Contract Time, will be issued by Project Manager as Owner's Field Order.

1.3 CHANGE ORDER PROPOSAL REQUEST

A. Owner-Initiated Proposal Requests
   1. Proposal changes in the Work will be issued by Project Manager, with a detailed description of proposed change and supplemental or revised Drawings and specifications. Proposal requests issued by Project Manager are for information only. Do not consider them instruction either to stop work in progress or to execute proposed change.
   2. Unless otherwise indicated in proposal request, within 7 calendar days of receipt of proposal request, submit to Project Manager for Owner's review an estimate of costs as specifies in Conditions of the Contract.

B. Contractor-Initiated Change Order Proposal Requests
   1. When Contractor identifies conditions that require modifications to Contract Documents, Contractor may propose changes by submitting request for change to Project Manager.
      a. Outline reasons for change and effect of change on the Work. Provide complete description of proposed change including proposed modifications to Contract Documents. Indicate effect of proposed changes on Contract Sum and Contract Time.
      b. Estimate costs broken down as specified in General conditions.
      c. Comply with requirements in Section 01 600 if proposed change in the Work requires substitution of one product or system for product or system specified.
   2. Should Project Manager agree proposed modifications are necessary, Project Manager will issue a detailed description of proposed change and supplemental or revised Drawings and specifications. Proposal requests issued by Project Manager are for information only. Do not consider them instruction either to stop work in progress or to execute proposed change.
   3. Unless otherwise indicated in proposal request, within 7 calendar days of receipt of proposal request, submit final estimate of costs as specified in the Conditions of the Contract.

1.4 ALLOWANCES

A. Allowance adjustment – Base each Change Order Proposal Request for allowance cost adjustment solely on difference between actual purchase amount and allowance, multiplied by final measurement of work in place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
   1. Include installation costs in purchase amount only where indicated as part of allowance.
   2. When requested, prepare explanations and documentation to substantiate margins claimed.
   3. Submit substantiation of change in scope of work claimed in Modification related to unit-cost allowances.
   4. Owner reserves the rights to establish actual quantity of work in place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of change in scope or nature of allowance described in contract Documents, whether for purchase order amount or Contractor's handling, labor, installation, overhead, and profit, within 20 days of receipt of change order or construction change directive authorizing work to proceed. Claims submitted later than 20 days will be rejected.
   1. Change Order cost amount shall not include Contractor's or Subcontractor's indirect expense except when it is clearly demonstrated that either nature or scope of work required was changed from that which could have been foreseen from description of allowance and other information in Contract Documents.
   2. No change to Contractor's indirect expense is permitted for selection of higher or lower priced materials or system of same scope and nature as originally indicated.

1.5 CHANGE ORDER PROCEDURES

A. Upon Owner's approval of Change Order Proposal Request, Project Manager will issue a Change Order for signatures of Owner and Contractor, as provided in Conditions of the Contract.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 035

SECTION 01 040
COORDINATION

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Administrative and supervisory requirements necessary for Project coordination including –
   a. Coordinate.
   b. Administrative and supervisory personnel.
   c. General installation provisions.
   d. Cleaning and Protection.

B. Related Sections
   1. Section 01 200, Project Meetings – Progress meetings, coordination Meetings, and pre-installation conferences.
   2. Section 01 300, Submittals – Requirements for Contractor's Construction Schedule.

1.2 PROJECT COORDINATION

A. Coordinate construction activities included in Contract Documents to assure efficient and orderly installation of each part of the Work. Coordinate construction operations that are dependent upon each other for proper installation, connection and operation.
   1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in sequence required to obtain best results.
   2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports and attendance at meetings. Prepare similar memoranda for Owner and separate Contractors where coordination of their Work is required.

C. Administrative Procedures – Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following –
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Project Close-out activities.

D. Conservation – Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions – Require installer of each major component to inspect both substrate and conditions under which Work is to be performed. Notify Project Manager in writing of unsatisfactory conditions. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions – Comply with Manufacturer's installation instructions and recommendations, to extent that those instructions and recommendations are more explicit and stringent the requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work, Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects – Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain best visual effect. Refer questionable choices to Project Manager for final decision.

F. Recheck measurements and dimensions before starting each installation.

G. Install each component during weather conditions and Project status that will ensure best possible results. Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize necessity of uncovering completed construction for that purpose.

I. Mounting heights – Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry or local codes for particular application indicated. Refer questionable mounting height decisions to Project Manager for final decision.

3.2 CLEANING & PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration until Substantial Completion.

B. Clean and maintain completed construction as frequently as necessary throughout construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures – Supervise construction activities to ensure that no part of construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

END OF SECTION 01 040

SECTION 01 090
REFERENCES

PART 1 GENERAL

1.1 REFERENCE STANDARDS

A. Industry standards

1. Except where Contract Documents include more stringent requirements, applicable construction industry standards have same force and effect as if bound or copied directly into Contract Documents to extent referenced. Such standards are made a part of Contract Documents by reference.
2. Comply with standard in effect as of date of Contract Documents, unless specific date is specified.
3. Where compliance with two or more standards is specified, and standards may establish different or conflicting requirements for minimum quantities or levels, refer requirements that are different, but apparently equal, and uncertainties to Project Manager for final decision before proceeding. Quantity or quality levels shown or specified shall be at minimum provided or performed. Actual installation may comply exactly with minimum quantity or quality specified, or it may exceed minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for context of requirements. Refer uncertainties to Project Manager for decision before proceeding.
4. Each entity engaged in construction on Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with Contract Documents. Where copies of standards are needed for performance of a required construction activity, Contractor shall obtain copies directly from publication source.
5. Trade association names and titles of general standards are frequently abbreviated. Following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean associated names. Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

AABC	American Air Balance Council, 1518 K St NW, Suite 503, Washington, DC 20005 (202) 737-0202
AAMA	American Architectural Manufacturers Assoc, 1540 K Street NW, Palantine, IL 60067 (708) 202-1350
AAN	American Association of Nurserymen, 1250 Eye St NW, Suite 500, Washington, DC 20005 (202) 789-2900
AASHTO	American Association of State Highway & Transportation Officials, 444 North Capitol St, Suite 249, Washington, DC 20001 (202) 624-5800
ACI	American Concrete Institute, P.O. Box 19150, 22400 West 7 Mile Rd, Detroit, MI 48219 (313) 532-2600
AGA	American Gas Assoc, 1515 Wilson Blvd, Arlington VA 22209 (703) 841-8400
AIA	American Institute Of Architects, 1735 New York Ave NW, Washington, DC 20006 (202) 626-7300
AISC	American Institute of Steel Construction, One East Wacker Drive, Suite 3100, Chicago, IL 60601-2001 (312) 670-2400
AISI	American Iron & Steel Institute, 1101 17th St NW, Washington, DC 20036-4700 (202) 452-7100
AITC	American Institute of Timber Construction, 7012 South Revere Parkway #140, Englewood CO 80112 (303) 792-9559
AMCA	Air Movement & Control Assoc, 30 West University Dr, Arlington Heights, IL 60004 (312) 394-0150

ANSI	American National Standards Institute, 11 West 42nd St, New York NY 10036 (212) 642-4900
APA	American Plywood Assoc, P.O. Box 11700 (98411, 7011 South 19th St (98466), Tacoma, WA (206) 565-6600
ARI	Air Conditioning & Refrigeration Institute, 4301 Fairfax Drive, Suite 425, Arlington, VA 22203 (703)524-8800
ASHRAE	American Society of Heating, Refrigeration, & Air conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329 (404) 636-8400
ASME	American Society of Mechanical Engineers, 345 East 47th St. New York, NY 10017 (212) 705-7722
ASTM	American Society for Testing & Materials, 1916 Race St, Philadelphia, PA 19103 (215) 299-5400
AWI	Architectural Woodwork Institute, 13924 Braddock Road, Suite 100, P O Box 1550, Centreville, VA 22020 (703) 222-1100
AWPA	American Wood Preservers' Assoc, P O Box 286, Woodstock MD 21163-0286 (410) 465-3169
AWS	American Welding Society, 550 LeJeune Road NW, P O Box 351040, Miami, FL 33135 (305) 443-9353
AWWA	American Water Works Assoc, 6666 West Quincy Ave, Denver, CO 80235 (303) 794-7711
BHMA	Builders' Hardware Manufacturers Assoc, 355 Lexington Ave, 17th Floor, New York NY 10017 (212) 661-4261
BIA	Brick Institute of America, 11490 Commerce Park Drive, Suite 300, Reston VA 22091 (703) 620-0010
CRI	Carpet & Rug Institute, P O Box 2084, Dalton, GA 30722 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute, 933 Plum Grove Rd, Schaumburg, IL 60173 (312) 517-1200
DHI	Door & Hardware Institute, 14170 Newbrook Drive, Chantilly, VA 22021 (703) 222-2010
EIMA	EIFS Industry Manufacturers Association, 2759 State Road 580, Suite 112, Clearwater FL 34621 (813) 726-6477
FM	Factory Mutual Research Organization, 1151 Boston-Providence Turnpike, Norwood, MA 02062 (617) 762-4300
GA	Gypsum Association, 810 First Street NE, Suite 510 Washington, DC 20002 (202) 289-5440
IEEE	Institute of Electrical & Electronic Engineers, 345 East 47th St, New York, NY 10017 (212) 705-7900
LPI	Lightning Protection Institute, 33365 North Arlington Heights Road, Arlington Heights, IL 60004 (800) 488-6864
MFMA	Maple Flooring Manufacturers' Assoc, 60 Revere Dr, Suite 500, Northbrook, IL 60062 (708) 480-9138
NAAMM	National Association of Architectural Metal Manufacturers, 600 South Federal St, Suite 400, Chicago, IL 60605 (312) 922-6222
NEC	National Electric Code (from NFPA)
NEMA	National Electrical Manufacturer's Association, 2101 'L' St, NW, Washington, DC 20037 (202) 457-8400
NFPA	National Fire Protection Assoc, One Batterymarch Park, P O Box 9101, Quincy, MA 02269-9101 (80) 344-3555
NFRC	National Fenestration Rating Council, 1300 Spring Street, Suite 120, Silver Spring, MD 20910 (301) 589-6372
NSF	National Sanitation Foundation, 3475 Plymouth Rd, P O Box 1468, Ann Arbor, MI 48106 (313) 769-8010
NWWDA	National Wood Window and Door Association, 1400 East Touhy Ave, #G54, Des Plaines, IL 60018 (213) 299-5200

PCA	Portland Cement Assoc, 5420 Old Orchard Road, Skokie, IL 60077 (312) 966-6200
PCI	Prestressed Concrete Institute, 175 West Jackson Blvd, Chicago, IL 60604 (312) 786-0300
PEI	Porcelain Enamel Institute, 102 Woodmont Boulevard, Suite 360, Nashville, TN 38205 (615) 385-0758
SDI	Steel Door Institute, 30200 Detroit Road, Cleveland OH 44145 (216) 899-0010
SIGMA	Sealed Insulating Glass Manufacturers Association, 401 North Michigan Avenue, Chicago IL 60611 (312) 644-6610
SJI	Steel Joist Institute, 1205 48th Avenue North, Suite A, Myrtle Beach, SC 29577 (803) 449-0487
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, 4201 Lafayette Center Drive, Chantilly, VA 22116 (703) 803-2980
SPIB	Southern Pine Inspection Bureau, 4709 Scenic Highway, Pensacola, FL 32504 (904) 434-2611
TCA	Tile Council of America, P O Box 326, Princeton, NJ 08542 (609) 921-7050
TPI	Truss Plate Institute, 583 D'Onofrio Drive, Suite 200, Madison, WI 53719 (608) 833-5900
UL	Underwriters Laboratories, 333 Pfingsten Rd, Northbrook, IL 60062 (708) 272-8800
WWPA	Western Wood Products Assoc, Yeon Building 522 SW 5th Avenue, Portland OR 97204-2122 (503) 224-3930

B. Federal Government agencies – Names and titles of federal government standard or specification producing agencies are often abbreviated. Following acronyms or abbreviations, as referenced in Contract Documents indicate names of standard or specification producing agencies of the federal government. . Names and addresses are subject to change and are believed to be, but are not assured to be, accurate and up to date as of date of Contract Documents.

CS	Commercial Standard (U>S> Department of Commerce), Government Printing Office, Washington, DC 20402 (202) 377-2000
DOT	Department of Transportation, 400 Seventh St SW, Washington, DC 20590 (202) 366-4000
EPA	Environmental Protection Agency, 401 'M' St SW, Washington, DC 20460 (202) 382-2090
FCC	Federal Communications Commission, 1919 'M' St NW, Washington, DC 20554 (202) 632-7000
FHA	Federal Housing Administration (U.S. Department of Housing and Urban Development), 451 Seventh ST SW, room 9158, Washington, DC 20201 (202) 708-1422
FS	Federal Specification (from GSA), Specification Unit (WFSIS), 7th & D St SW, Washington, DC 20406 (202) 708-9205
GSA	General Services Administration, F St & 18th St NW, Washington, DC 20405 (202) 472-1082
MIL	Military Standardization Documents (U.S. Department of Defense), Naval Publications & Forms Center, 5801 Tabor Ave, Philadelphia, PA 19120
OSHA	Occupational Safety & Heath Administration (U.S. Department of Labor), 200 Constitution Ave NW, Washington, DC 20410 (202) 219-6091
PS	Product Standards of NBS (U.S. Department of Commerce), Government Printing Office, Washington, DC 20402 (202) 783-3238
USDA	U.S. Department of Agriculture, Independence Ave between 12th and 14th Sts SW, Washington, DC 20250 (202) 447-8732

1.2 GOVERNING REGULATIONS/AUTHORITIES

A. Contact authorities having jurisdiction directly for information and decisions having bearing on the Work.

B. Obtain copies of regulations required to be retained at Project site, available for reference by parties who have a reasonable need for such reference.

1.3 SUBMITTALS

A. For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 090

SECTION 01 100
PROJECT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Provide coordination of Work
   1. Supervisory personnel.
   2. Pre-construction conference.
   3. Weekly On-Site Meetings.
   4. Other Meetings.

B. Submit daily and special reports.

C. Submit Progress Schedule, bar-chart type, updated monthly.

D. Prepare submittal schedule; coordinate with progress schedule.

E. Submit schedule of values.

F. Submit schedule of required tests including payment and responsibility.

G. Perform Construction Staking and Surveying:
   1. Laying out the work and verifying locations and elevations during construction.

H. Submit and post lists of emergency telephone numbers and addresses for individuals to be contacted in case of emergency.

I. Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

J. Submit payment request procedures.

K. Perform quality control during installation.

L. Clean and protect work.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 100

SECTION 01 200
PROJECT MEETINGS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Administrative and procedural requirements for project meetings including
   2. Pre- Construction Conferences.
   3. Pre-installation Conferences.
   4. Progress Meetings.

B. Related Sections
   1. Section 01 300, Submittals – Construction Schedules

1.2 PRE-CONSTRUCTION CONFERENCE

A. Schedule pre-construction conference and organizational meeting at Project site or other convenient location no later than 15 days after issuance of Notice To Proceed and prior to commencement of construction activities. Conduct meeting to review responsibilities and personnel assignments.

B. Attendees – Owner, Project Manager, and their consultants, Contractor and Contractor's Superintendent, major Subcontractors and other concerned parties shall each be represented at conferences by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda – Discuss items of significance that could affect progress including such topics as
   1. Tentative construction schedule.
   2. Critical Work sequencing.
   3. Designation of responsible personnel.
   4. Procedures for processing interpretations and Modifications.
   5. Procedures for processing Payment Requests.
   6. Distribution of Contract Documents.
   7. Submittal of Product Data, Shop Drawings, Samples, Quality Assurance/Controls submittals.
   8. Preparation of record documents and O & M Manual.
   9. Use of the premises.
   10. Office, work, and storage areas.
   11. Equipment deliveries and priorities.
   12. Safety procedures.
   13. First Aid.
   14. Security.
   15. Housekeeping.
   16. Working hours.
   17. Resolving current problems.
   18. Further orientation as to requirements of Contract Documents.
   19. Project Manager's responsibility to Owner for inspection.
   20. Working out general schedule of Project Manager's inspection.

1.3 PROGRESS MEETINGS

A. Project Manager will conduct progress meetings at project site at regularly scheduled intervals, at least once a month.

B. Attendees – In addition to representatives of Owner and Project Manager, Contractor and each Subcontractor concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with Project and authorized to conclude matters relating to progress.

C. Agenda

1. Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to current status of Project.
2. Progress since last meeting will be reviewed. Where each activity is in relation to Contractor's Construction Schedule, whether on time ahead or behind schedule will be determined. How construction behind schedule is to be expedited will be determined and commitments secured from parties involved to do so. Schedule revisions required to ensure that current and subsequent activities will be completed within Contract Time will be discussed.
3. Present and future needs of each entity present will be discussed, including such items as-
   a. Interface requirements.
   b. Time.
   c. Sequences.
   d. Deliveries.
   e. Off-site fabrication problems.
   f. Access.
   g. Site utilization.
   h. Temporary facilities and services.
   i. Hours of Work.
   j. Hazards and risks.
   k. Housekeeping
   l. Quality and Work standards.
   m. Modifications.
   n. Documentation of information for Payment Requests.

D. Reporting

1. No later than 3 days after each progress meeting date, copies of minutes will be distributed to each party present and to other parties who should have been present. Included will be a brief summary, in narrative form, of progress since previous meeting and report.
2. Contractor shall revise construction schedule after each progress meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

1.4 PRE-INSTALLATION MEETINGS

A. Conduct pre-installation meeting at site prior to commencement of work specified in trade Sections requiring such a meeting. Attendees shall be Project Manager, Contractor, applicable Subcontractors, item or system suppliers/installers, Manufacturer's representatives, and others as specified or invited. These meetings shall be scheduled by the Contractor to be held in conjunction with Project Manager's regularly scheduled inspection visits, if possible.

1. Review progress of other construction activities and preparations for particular activities under consideration at each pre-installation meeting, including requirements for –
   a. Reviewing and confirming requirements of Contract Documents including related Modifications.
   b. Verify that completed work is ready for installation of items or systems.
   c. Resolving conditions not in compliance with installation requirements.
   d. Establishing installation and inspection schedule.
   e. Coordinate between trades.
   f. Other trades which affect work of trade Section.

g. Other items specified in individual Sections.
h. Deliveries.
i. Product Data, Shop Drawings, Samples, Quality Assurance/Controls submittals.
j. Possible conflicts.
k. Compatibility problems.
l. Weather limitations.
m. Manufacturer's recommendations.
n. Compatibility of materials.
o. Temporary facilities.
p. Space and access limitations.
q. Governing regulations.
r. Safety.
s. Testing requirements.
t. Required performance results.
u. Recording requirements.
v. Protection.

2. Record significant discussions and agreements and disagreements of each meeting, along with approved schedule. Distribute record of meeting promptly to everyone concerned, including Owner and Project Manager.
3. Do not proceed with work of affected Section of conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene conference within one week.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 200

SECTION 01 300
SUBMITTALS

PART 1 GENERAL

1.1 SUMMARY

A. Comply with project formats for submittals.

B. Provide types of Submittals listed in individual sections and number copies required.
1. Shop drawings, reviewed and annotated by Contractor – three (3) blackline prints.
2. Product data – 3 copies
3. Inspection and test reports – 3 copies
4. Warranties – 3 copies
5. Survey data – 3 copies
6. Closeout submittals – 3 copies

C. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.

D. Shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and detail, including adjacent construction and related work. Note special coordination required. Note and deviation from requirements of the Contract Documents.

E. Provide warranties as specified; warrantees shall not limit length of time for remedy of damages Owner may have by legal statute. Warrantees shall be signed by Contractor, Supplier or Installer responsible for performance of warranty.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 300

SECTION 01 600
PRODUCTS AND SUBSTITUTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as recommended by manufacturers of primary materials.

B. Provide products selected or equal which shall be reviewed by Project Manager prior to Bid. Products submitted for substitution shall be submitted with acceptable documentation, and include costs of substitution including related work.

C. Conditions for substitution include:
1. An 'or equal' phrase in the specifications.
2. Specified material cannot be coordinated with other work.
3. Specified material is not acceptable to authorities having jurisdiction.

D. Substitutions shall be submitted prior to award of contract, unless otherwise acceptable. Review of shop drawings, product data, or samples does not constitute substitution acceptance unless clearly presented as a substitution at the time of submittal.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 600

SECTION 01 700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SUMMARY

A. The following a prerequisites to substantial completion. Provide the following:
   1. Punch List
   2. Supporting documentation.
   3. Warranties.
   4. Certifications.

B. Provide the following prerequisites to final acceptance:
   1. Final Payment request with supporting affidavits.
   2. Completed punch list.

C. Provide a marked-up set of drawings including changes which occurred during construction.

D. Provide the following closeout procedures:
   1. Submission of record documents.
   2. Submission of maintenance manuals.
   3. Training and turnover to Owner's personnel.
   4. Final Cleaning and touch-up.

PART 2 PRODUCTS – Not used

PART 3 EXECUTION – Not used

END OF SECTION 01 700

SECTION 01 800
QUALITY CONTROL

PART 1– General

1.1 SUMMARY

This Section specifies requirements for quality control services. Quality control services include inspections and test performed by independent agencies, governing authorities, as well as the Contractor.

A. Testing Responsibilities: The Contractor shall provide inspections and tests specified or required by governing authorities. The Contractor shall engage and pay for services of an independent agency to perform inspections and test specified in the schedule attached herein.

B. Retesting: The Contractor is responsible for retesting costs where results prove unsatisfactory and do not indicate compliance with Contract Documents, regardless of whether the original test was the Contractor's responsibility.

1. Cost of retesting construction revised or replace by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

C. Associated Services: The Contractor shall cooperate with agencies performing inspections or tests and provide auxiliary services as requested. Notify the agency in advance of operations to permit assignment of personnel. Auxiliary services include but are not limited to:

1. Provide access to the Work and furnish incidental labor and facilities necessary to facilitate inspections and tests.
2. Take representative samples of materials that require testing or assist the agency in taking samples.
3. Provide facilities for storage and curing of samples, and deliver samples to testing laboratories.
4. Provide a preliminary design mix proposed for use for material mixes that require control by the testing agency.
5. Provide security and protection of samples and test equipment at the Project site.

D. Duties of the Testing Agency: The agency engaged to perform inspections and testing of materials and construction shall cooperate with the Architect and Contractor in performance of its duties, and provide qualified personnel to perform inspections and tests.

1. The agency shall notify Architect and Contractor promptly of deficiencies observed during performance of its services.
2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

E. Coordination: This Contractor and each agency engaged to perform inspections and tests shall coordinate the sequence of activities to avoid removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling inspections, tests, taking samples and similar activities.

F. Submittals: The testing agency shall submit a certified written report or each inspection and test to the Architect, in duplicate unless the Contractor is responsible for the service. If the Contractor is responsible, submit a certified written report of each inspection and test through the Contractor, in duplicate. Submit additional copies of each report to the governing authority, when the authority so directs.

G. Report Date: Written reports of each inspection or test shall include, but no be limited to:
Date of Issue
Project title and number

Name, address and telephone number of testing agency
Dates and locations of samples and test or inspections
Names of individuals making the inspection or test
Designation of the Work and test method
Identification of product and Specification Section
Complete inspection or test data
Test results and an interpretation of test results
Ambient conditions at the time of sample taking and testing
Comments or professional opinion as to whether inspected or tested work complies with Contract Document requirements
Name and signature of laboratory inspector
Recommendations or retesting

H. Qualifications for Service Agencies: Engage inspection and testing agencies which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and specialize in the types of inspections and tests to be performed. Each inspection and testing agency engaged shall be authorized to operate in the State in which the Project is located.

I. Repair and Protection: Upon completion of inspection and testing repair damaged construction and restore substrates and finishes to eliminate deficiencies. Comply with requirements for "Cutting and Patching". Protect construction exposed by or for quality control service activities and protect repaired construction. The Contractor is responsible for repair and protection regardless of the assignment of responsibility for inspection and testing.

PART 2 – SCHEDULE OF CONTRACTOR PROVIDED TESTING SERVICES

A. Earthwork: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.

1. Field density tests may also be performed by the nuclear method in accordance with ASTM D 2922, providing that the calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gages in accordance with STM D 3017.
2. If field tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Project Architect.

B. Footing Subgrade: For each strata of soil on which footings will be placed, perform at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to Project Architect.

C. Paved Areas: Perform at least one field density test of subgrade for every 2,000 sq. ft. of paved area of slab, but in no case fewer than three tests. In each compacted fill layer, perform one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case fewer than three tests.

D. Asphalt Paving: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness.

E. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
Base Course: 1/2", plus or minus
Surface Course: 1/4", plus or minus

F. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with, and at right angles to centerline of paved area. Surface will not be acceptable if exceeding the following tolerances for smoothness:

Base Course Surface: 1/4"
Wearing Course Surface: 3/16"

Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template; 1/4". Check surface areas at intervals as directed by Architect.

G. Portland Cement Concrete (Paving & Structural): Sampling and testing for quality control during placement of concrete may include the following, as direct by Architect.

H. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
2. Air Content: ASTM C 173, volumetric method for lightweight of normal weight concrete; ASTM D 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entranced concrete.
3. Compression Test Specimen: ASTM C 31; one set of 3 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
4. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, one specimen tested at 28 days, and one specimen retained in reserve for later testing if required. When total quantity of a given class of concrete is less than 50 cu. yds, strength test may be waived by Architect, if, in the Architect's judgment, adequate evidence of satisfactory strength is provided. When strength of field-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

END OF SECTION 01 800

GENERAL CONDITIONS

1. DEFINITIONS

1.1 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.

1.2 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.

1.3 BID - The offer or proposal of the Bidder submitted on the prescribed forms setting forth the prices for the Work to be preformed.

1.4 BIDDER - Any person, firm or corporation submitting a Bid for the Work.

1.5 BONDS - Bid, Performance and Payment Bonds and other instruments of security, furnished by the Contractor and the Contractor's surety in accordance with the Contract Documents.

1.6 CHANGE ORDER - A written order to the 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 or Contract time.

1.7 CONTRACT DOCUMENTS - The contract, including Advertisement for Bids, Information for bidders, Additional information for bidders, Bid Bond, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Specifications, and Addenda.

1.8 CONTRACT PRICE - The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

1.9 CONTRACT TIME - The number of calendar days stated in the Contract Documents for the completion of the Work.

1.10 CONTRACTOR - The person, firm or corporation with whom the Owner has executed the agreement.

1.11 DRAWINGS - The part of the Contract Documents which show the characteristics and scope of the Work to be performed and which have been prepared by the Engineer.

1.12 ENGINEER - The person, firm or corporation named as such in the Contract Documents.

1.13 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 to the Contractor during construction.

1.14 NOTICE OF AWARD - The written notice of the acceptance of the Bid from the Owner to the successful bidder.

1.15 NOTICE TO PROCEED - The written communication issued by the Owner to the Contractor authorizing the Contractor to proceed with the work and establishing the date of commencement of the work.

1.16 OWNER - Layton City Corporation, and Political subdivision of the State of Utah.

1.17 PROJECT - The undertaking to be performed as provided in the Contract Documents.

1.18 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the Owner who is assigned to the Project site or any part thereof.

1.19 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, subcontractor, manufacturer, supplier or distributor which illustrate how specific portions of the Work shall be fabricated or installed.

1.20 SPECIFICATIONS - A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, constructions systems, standards and workmanship.

1.21 SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.

1.22 SUBSTANTIAL COMPLETION - That date as certified by the Engineer 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 purpose for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to the General Conditions required by the Owner amending or expanding the General Conditions.

1.24 SUPPLIER - Any person 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.

1.25 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.

1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at the last given address or delivered in person to said party or an authorized representative on the Work.

2. ADDITIONAL INSTRUCTIONS AND DETAILS DRAWINGS

2.1 The Contractor may be furnished additional instructions and detail drawings, by the Engineer, as necessary to carry out the Work required by the Contracts Documents.

2.2 The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the Contract Documents for the Work to be preformed.

3.2 Prior to the first partial payment estimate the Contractor shall submit construction progress schedules showing the order in which he proposes to carry on the Work, including dates at which he will start various parts of the Work, estimated date of completion of each part and as applicable:

3.2.1 The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The Contractor shall also submit a schedule of payments that he anticipates he will earn during the course of the Work.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the Drawings and Specifications is that the 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.

4.2 In case of conflict between the Drawings and the Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale

dimensions, and detailed drawings shall govern over general drawings.

4.3 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 Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's Risk.

5. SHOP DRAWINGS

5.1 The Contractor shall provide Shop Drawings as may be necessary for the prosecution of the work as required by the Contract Documents. The engineer shall promptly review all shop drawings. The engineer's approval of any shop drawing shall not release the Contractor from responsibility for deviations from the Contract Documents. The approval of any shop drawing which substantially deviates from the requirement of the Contract Documents shall be evidenced by a Change Order.

5.2 When submitted for the Engineer's review, shop drawings shall bear the 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.

5.3 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 Shop drawing and each approved sample shall be kept in good order by the contractor at the site and shall be available to the Engineer.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specially stated in the Contract Documents, the 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.

6.2 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.

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

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.

6.5 Materials, supplies or equipment to be incorporated into the work shall not be purchased by the 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.

7. INSPECTIONS AND TESTING

7.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

7.2 The Owner shall provide all inspections and testing services not required by the Contract Documents.

7.3 The Contractor shall provide at the Contractor’s expense the testing and inspection services required by the Contract Documents.

7.4 If the Contractor Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to specifically be inspected, tested or approved, by someone other that the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

7.5 Inspections, test or approvals by the engineer or others shall relieve the Contractor from obligations to perform the work in accordance with the requirements of the Contract Documents.

7.6 The Engineer and the Engineer’s representatives will at all times have access to the Work. 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 Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.

7.7 If any work is covered contrary to the written instruction of the Engineer, it must, if requested by the

Engineer, be uncovered for observation and replaced at the Contractor's expense.

7.8 If the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Engineer's request, will 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 Contractor will 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 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 shall be issued.

8. SUBSTITUTION

8.1 Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to a brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract price and the Contract Documents shall be appropriately modified by Change Order. No Contract price increase will be allowed for substitutions recommended by the Contractor. The Contractor warrants that if substitutes are approved, no mayor changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be may by the Contractor without a change in the Contract Price or the Contract Time.

9. PATENTS

9.1 The Contractor shall pay all applicable royalties and license fees. The Contractor shall defend all suits or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The Owner shall furnish all boundary surveys and establish all base lines for locating the principal components parts of the work together with a suitable number of bench marks adjacent to the Work as shown in the Contract Documents. From the information provided by the Owner, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope staked, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

10.2 The Contractor shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permit and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise stated in the Supplemental General Conditions. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Section 13, Changes in the Work.

11. PROTECTION OF WORK, PROPERTY, AND PERSONS

11.1 The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons 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.

11.2 The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The Contractor will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. The Contractor will notify owners of adjacent utilities when prosecution of Work may affect them. The contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them 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 Contractor.

11.3 In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization form the Engineer or Owner, shall act to prevent threatened damage, injury or loss. The Contractor will give the Engineer prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY THE CONTRACTOR

12.1 The Contractor will supervise and direct the Work. The Contractor will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

13. CHANGES IN THE WORK

13.1 The Owner may at any time, as the need arises, order changes within the scope of the 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, an equitable adjustment shall be authorized by Change Order.

13.2 The Engineer, also, may at any time, by issuing a Field Order, make changes in the details of the work. The contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer unless the Contractor believes that such Field Order necessitates a change in Contract Price or Time, or both, in which event he shall give the Engineer written notice thereof within seven (7) days after the receipt of the ordered change. Thereafter the Contractor shall document the basis for the change in Contract Price or Time within thirty (30) days. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instructions from the Owner.

14. CHANGES IN CONTRACT PRICE

14.1 The Contract Price may be changed only by a Change Order. The value of any Work covered by a Change Order or of any claim for increase or decrease in the Contract Price shall be determined by one or more of the following methods in the order of precedence listed below:

a. Unit price previously approved.

b. An agreed lump sum.

c. The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the Work to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 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.

15.2 The Contractor will 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 Contractor and the Owner, that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

15.3 If the Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Bid for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

15.4 The Contractor shall 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 Contractor has promptly given Written Notice of such delays to the Owner or Engineer.

15.4.1 To any preference, priority or allocation order duly issued by the Owner.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of subcontractors occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The contractor shall promptly remove from the premises all Work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the 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 Contractors destroyed by such removal or replacement.

16.2 All removal and replacement Work shall be done at the Contractor's expense. If the 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 at the expense of the Contractor.

17. SUBSURFACE CONDITIONS

17.1 The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Owner by Written Notice of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract documents: r

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

17.2 The Owner shall promptly investigate the conditions, and if conditions materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Contract Documents shall be modified by a Change Order, Any claim of the Contractor for adjustment hereunder shall not be allowed unless the Contractor has given the required Written Notice: provided that the Owner may, if the Owner determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The Owner may suspend the Work or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the Contractor, by Written Notice to the Contractor, which notice shall fix the date on which the Work shall resume. The Contractor will resume that Work on the date so fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

18.2 If the Contractor is adjudged a bankrupt or insolvent, or makes a general assignment for the benefit of creditors, or if a trustee or receiver is appointed for the Contractor or for any of the Contractor’s property, or if the Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if the Contractor repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if the Contractor repeatedly fails to make prompt payments to Subcontractors or for labor, materials or equipment or if the Contractor disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the Work or if the Contractor disregards the authority of the Engineer, or if the Contractor otherwise violates any provision of the Contract Documents, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor and the Contractor’s surety a minimum of ten (10) days from delivery of a Written Notice, terminate the services of the Contractor and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, and finish the work by whatever method deemed expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional service, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the Contractor WILL PAY THE DIFFERENCE TO THE OWNER.

Such costs incurred by the Owner will be determined by the Engineer and incorporated in a Change Order.

18.3 Where the Contractor's services have been so terminated by the Owner, said termination shall not affect any right of the Owner against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents.

18.4 After ten (10) days from delivery of a Written Notice to the Contractor, the Owner may, without cause and without prejudice to any other right or remedy, elect to abandon the Project and terminate the Contract. In such case, the Contractor shall be paid for all Work executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) days by the Owner or under an order of court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the Owner fails to pay the Contractor substantially the sum approved by the Engineer or awarded by arbitrators within thirty (30) days of its approval and presentation, then the Contractor may, after ten (10) days from delivery of a Written Notice to the Owner, terminate the Contract and recover from the Owner payment for all Work executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT. if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until the Contractor has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified. within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME. or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), The CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by, such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER's title to the material and equipment and protect any interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing any reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. The OWNER at any time, however, after fifty (50) percent of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five (5%) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS. payment may be made in full, including retained percentages, less authorized deductions.

19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the

CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility, for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUB-CONTRACTORS, laborers, workmen, mechanics, materialmen, and furnisher of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the, nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, the Contractor's Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the 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 this Work. Any payment, however, final or otherwise, shall not release the Contractor or the Contractor's sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bonds.

21. INSURANCE

21.1 The Contractor shall purchase and maintain such insurance as will protect the Contractor, the Owner and the Engineer from claims set forth below which may arise out of or result from the Contractor's execution of the Work, whether such execution be by the Contractor or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of any employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the Owner shall be filled with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverage afforded under the policies will not be cancelled unless at least fifteen (15) days prior Written Notice has been given to the Owner.

21.3 The Contractor shall procure and maintain, at the Contractor's own expense, during the Contract time, liability insurance as hereinafter specified;

21.3.1 Contractor's General Public Liability and Property Damage Insurance including vehicle coverage issued to the Contractor and protecting from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the Contract Documents, whether such operations are performed by the Contractor or by any Subcontractor, or anyone directly or indirectly employed by the Contractor or by a Subcontractor under him. Insurance shall be written with a limit of liability of not less than $1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than $2,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $2,000,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.1.a The Contractor's General Public Liability and Property Damage Insurance shall include the Owner and the Engineer as additional insured during the Contract time and shall be provided at no expense to the Owner or Engineer.

21.3.2 The Contractor shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the Project to the full insurable value thereof for the benefit of the Owner, the Contractor, and Subcontractors as their interest may appear. This provision shall in no way release the Contractor or Contractor's surety from obligations under the Contract Documents to fully complete the Project.

21.4 The Contractor shall procure and maintain, at the Contractor’s own expense, during the Contract Time, in accordance with the provisions of the laws of the State in which the work is performed, Workman's Compensation Insurance, including occupational disease provisions, for all of the Contractor’s employees at the site of the Project and in case any work is sublet, the Contractor shall require such Subcontractor similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the Project is not protected under Workmen's Compensation statute, the Contractor shall provide, and shall cause each Subcontractor to provide, adequate and suitable insurance for the protection of all employees not otherwise protected.

21.5 The Contractor shall secure, if applicable, "All Risk" type Builder's Risk Insurance for Work to be preformed. Unless specifically authorized by the Owner, the amount of such insurance shall not be less than the Contract Price totaled in the Bid. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft and smoke during the Contract Time, and until the Work is accepted by the Owner. The policy shall name as the insured the Contractor, the Engineer and the Owner.

22. CONTRACT SECURITY

22.1 The Contractor shall within ten (10) days after the receipt of the 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 Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supply labor and materials in the prosecution of the Work provided by the Contract Documents, Such bonds shall be executed by the 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 Contractor. If ant 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 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 Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable Bond to the Owner.

23. SECTION DELETED

24. INDEMNIFICATION

24.1 The Contractor will indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use

resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, or the Engineer's agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications.

25. SEPARATE CONTRACTS

25.1 The Owner reserves the right to let other contracts in connection with Project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly connect and coordinate the Work with of all Contractors. If the proper execution or results of any part of the Contractor's Work depends upon the Work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such Work that render it unsuitable for such proper execution and results.

25.2 The Owner may perform additional Work related to the Project, or may let other contracts containing provisions similar to these. The Contractor will afford the other Contractors who are parties to such Contracts (or the Owner, if performing the additional Work), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate the Work of all Contractors.

25.3 If the performance of additional Work by other Contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional Work. If the Contractor believes that the performance of such additional Work by the Owner or others involves an additional expense or requires an extension of the Contract Time, the Contractor may make a claim therefor as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors.

26.2 The Contractor shall not award Work to Subcontractor(s), in excess of fifty (50%) percent of the Contract Price, without prior written approval of the Owner.

26.3 The Contractor shall be fully responsible to the Owner for the acts and omissions of the Subcontractors, and of persons either directly or indirectly employed by them, as well as for the acts and omissions of the Contractors direct employees.

26.4 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind Subcontractors to the Contractor by terms of the Contract Document insofar as applicable to the Work of Subcontractors and to give the Contractor the same power as regards termination any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

27. ENGINEER'S AUTHORITY

27.1 The Engineer shall act as the Owner's representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and Work performed. He shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.

27.2 The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship and execution of the Work. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The Engineer shall promptly make decisions relative to interpretation of the Contract Documents.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of Notice to Proceed, the Owner shall obtain all land and rights-of-way necessary for

carrying out and for the completion of the Work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

28.2 The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The Contractor shall provide at the Contractor's own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary facilities, or for storage of materials.

29. GUARANTY

29.1 The Contractor shall guarantee all materials and equipment furnished and Work performed for a period of one (1) year from the date of Substantial Completion. The Contractor warrants and guarantees for a period of one (1) year from the date of Substantial Completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the 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 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 Contractor the cost thereby incurred. The performance Bond shall remain in full force and effect through the guarantee period.

30. ARBITRATION

30.1 All claims, disputes and other matters in question arising out or, or relating to the Contract Documents or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgement may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the demand for arbitration shall be filed in writing with the other party to the Contract Documents and with the American Arbitration Association. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

30.3 The Contractor will carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

31.1 The Contractor will pay all sales, consumer-use and other similar taxes required by the law of the place where the Work is performed.

SUPPLEMENTAL GENERAL CONDITIONS

CONTENTS

1. **ENUMERATION OF DRAWINGS**

The drawings for this project are as follows:

NAME	DRAWING NUMBER
ADAMS CANYON TRAILHEAD IMPROVEMENTS	**CONSTRUCTION BID SET**
CXT PRECAST PRODUCTS: ARAPAHOE	**PRELIMINARY PLAN SET**

2. **INSURANCE REQUIREMENTS FOR CONTRACTORS**

Contractors shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damages to property which may arise from, or in connection with the performance of the work hereunder by the Contractor, and the Contractor's agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Contractor's bid or proposal.

A. MINIMUM SCOPE OF INSURANCE

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001, Ed. 01-96).

2. Insurance Services Office form number CA 0001 (Ed 06-92) covering Automobile Liability, code 1 "any auto."

3. Workers' Compensation insurance as required by the State of Utah including Employers Liability insurance.

B. MINIMUM LIMITS OF INSURANCE

Contractor shall maintain limits no less than:

1. General Liability: $1,000,000 combined single limit per occurrence for bodily injury, property damage, and contractual liability. The Commercial General Liability Insurance general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be three times the required occurrence limit.

2. Automobile Liability: $1,000,000 combined single limit per accident for bodily injury and property damage. "Any Auto" coverage is required.

3. The General Aggregate Limit shall be amended to apply separately to each of the Contractor's projects away from premises owned by or rented by the Contractor.

4. Worker's compensation and Employer's Liability: Worker's compensation limits as required by the State of Utah and Employer's Liability Limits of $1,000,000 per accident.

C. DEDUCTIBLES AND SELF-INSURED RETENTION

Any deductibles or self-insured retention must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retention as respects the City, its officers, officials, employees, volunteers and agents; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

D. NOTICE OF INCIDENT OR ACCIDENT

Contractor shall agree to disclose to City all incidents or occurrences of accident, injury, and/or property damage covered by the insurance policy or policies.

E. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain the following provisions:

1. Commercial General liability and Automobile Liability Coverage

a. The City, its officers, officials, employees, volunteers and agents are to be covered as additional insured with respects to liability arising out of:

(i) Work or operations performed by or on behalf of the Contractor, including materials, parts or equipment furnished in connection with such work or operations;

(ii) The insured's general supervision of the Contractor or subcontractor;

(iii) Products and completed operations of the Contractor;

(iv) Premises owned, occupied or used by or on behalf of the Contractor;

(v) Automobiles owned, leased, hired or borrowed by or on behalf of the Contractor.

The coverage shall contain no special limitations on the scope of the protection afforded to the City, its officers, officials, employees or volunteers. Endorsement Form CG 20-09
(Ed. 03-97), Additional Insured – Owners, Lessees or Contractors (Form A) shall be used.

b. The Contractor's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees and volunteers. Any insurance of self-insurance maintained by the City, its officers, employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the City, its officers, officials, employees, volunteers or agents.

d. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. Worker's Compensation and Employer's Liability Coverage

The insurer shall agree to waive all rights of subrogation against the City, its officers, officials, employees, volunteers and agents for losses arising form work performed by the Contractor for the City.

3. All Coverage

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the City.

F. ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with a current A.M. Best & Company rating of no less than A: VII, or equivalent, to be acceptable to the City.

G. VERIFICATION OF COVERAGE

Contractor shall furnish the City with certificates of insurance and with original endorsements effecting coverage required by this clause. The endorsements should be on forms provided by the City or other than City forms or a separate owner's policy, provided these forms or policies are approved by the City and amended to conform with the City's requirements. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Where by statute, the City's Insurance commissioner is to be substituted. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the rights to require complete, certified copies of all required insurance policies, with all endorsements, at any time.

H. SUBCONTRACTORS

Contractors shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.

I. CONTRIBUTION NOT REQUIRED

As respects: (a) wok performed y the Named Insured for or on behalf of the City; or (b) products sold by the Named Insured to the City; or (c) premises leased by the Named Insured from the City, the insurance afforded by this policy shall be primary insurance as respects the city, its elected or appointed officers, officials, employees, volunteer, or agents; or stand in an unbroken chain of coverage excess of the Names Insured's scheduled primary coverage. In either event, any other insurance maintained by the city, its elected or appointed officers, officials, employees, volunteers, or agents shall be in excess of this insurance and shall not contribute with it.

J. INSURANCE

1.0 The Contractor shall purchase and maintain such insurance as will protect the Contractor, the Owner, its officers, employees, volunteers, agents, and the Engineer from claims set forth below which may arise out of or result from the Contractor's execution of the work, whether such execution by the Contractor or by an Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1.1 Claims under worker's compensation, disability benefit and other employee benefit acts;

1.2 Claims for damages because of bodily injury, occupational sickness or death of the Contractor's employees;

1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and

1.5 Claims for damages because of injury to or destruction of tangible property including loss of use resulting therefrom.

2. Certificates of insurance, with attached endorsements, amendments, and/or additions reflecting levels, types and amounts of insurance, acceptable to the Owner shall be filed with the Owner

prior to commencement of the Work. The Owner expressly reserves the right to receive a copy of applicable insurance policy or policies, upon request. These Certificates and endorsements shall contain a provision that coverage afforded under the policies will not be canceled unless at least thirty (30) days prior Written Notice (certified mail) has been provided to the Owner.

2.1 All required insurance must be in effect prior to awarding this contract and during the entire duration of the contract term. Contractor shall not commence work under this contract until it has obtained the insurance required herein and further specified in the Supplemental Conditions.

3. The Contractor shall procure and maintain, at the Contractor's own expense, during the Contract time, liability insurance as hereinafter specified.

3.1 Contractor's Commercial General Liability insurance, including vehicle coverage, issued to the Contractor and protecting the Contractor from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the Contract Documents, whether such operations be by the Contractor or by any Subcontractor under the Contractor, or anyone directly or indirectly employed by the Contractor or by a Subcontractor under the Contractor. Insurance coverage shall be "occurrence" based unless specifically waived by the Owner. Insurance shall be written with a limit of liability of not less than $1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damage sustained by two or more persons in any one accident. Said amount of coverage shall be for this specific project. Any aggregation may require additional coverage.

3.1.a The Contractor's Commercial General Liability Insurance shall include the Owner, its officers, officials, employees volunteers, agents and the Engineer as additional insured's during the Contract time and shall be provided at no additional expense. The insurance coverage for the additional insured's shall pay for all damages attributed to them and shall pay for the costs of defending any action filed hereunder when the additional insured's are made parties to that action.

3.1.b Minimum liability levels may be increased in the Supplemental General Conditions section of the contract if activity has a severe loss potential. Total aggregate liability levels for personal injury including death, and all claims for destruction of property arising out of or in connection with any operations under the contract Documents, will be a multiple of the occurrence limit and must equal or exceed the aggregate level set in the Supplemental General Conditions section of the Contract.

3.2 The Contractor shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the Project to the full insurable value thereof for the benefit of the Owner, the Contractor, and Subcontractors as their interest may appear. This provision shall in no way release the Contractor's surety from obligations under the Contract Documents to fully complete the Project. Otherwise each subcontractor shall each meet the insurance requirement as set forth in this agreement.

4. The Contractor shall procure and maintain, at Contractor's expense, during the Contract Time, in accordance with the provisions of the laws of the State in which the work is performed. Worker's Compensation Insurance, including occupational disease provisions, for all the Contractor's employees at the site of the Project and in the case of any work is sublet, the Contractor shall require such Subcontractor similarly to provide Worker's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of

employees engaged in hazardous work under this contract at the site of the Project is not protected under Worker's compensation statue, the Contractor shall provide, and shall cause each Subcontractor to provide, adequate and suitable insurance for the protection of employees not otherwise protected.

5. The Contractor shall secure, if applicable, "All Risk" type Builder's Risk Insurance for Work to be performed. Unless specifically authorized by the Owner, the amount of such insurance shall not be less than the Contract Price totaled in the Bid. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft and smoke during the Contract time, and until the Work is accepted by the Owner. The policy shall name as the insured the Contractor, the Engineer and the Owner.

6. The Contractor's policy or policy endorsement must state the Contractor's insurance is primary protection, and Owner's insurance will not be called upon to contribute to a loss that should otherwise be paid by the Contractor's insurer.

7. Contractor's insurer or insurance underwriter must have at minimum an A.M. Best & Company rating of "A.VII" or equivalent. Coverages shall be with insurance carriers licensed and admitted to do business in the State o Utah.

8. Contractor shall disclose all deductibles or self-insured retentions (SIR). At Owner's option, all deductibles and SIRs shall be covered by an endorsement eliminating them, or a bond shall be posted covering them and any defenses required thereby.

3. COORDINATION OF DRAWINGS AND SPECIFICATIONS

Any part of the work which is not mentioned in these specifications, but is shown on the drawings, or any part not shown on the drawings but described in the specifications, shall be furnished and installed by the Contractor as if fully described in the specifications and shown on the drawings.

4. INCIDENTAL WORK

All minor details of work and materials which are not shown on the drawings, as well as such items which are not specifically mentioned in the specifications, but are obviously necessary for the proper completion of the work, shall be considered as incidental, and as being a part of and included with the work for which prices are given in the proposal, and no extra compensation shall be allowed the Contractor for the performance thereof.

5. COMPETENT PERSONNEL AND EQUIPMENT TO BE EMPLOYED

A. The Contractor shall employ suitable and competent mechanics for every kind of work. If any person employed by the Contractor is incompetent, disorderly or disobedient to the Engineer or the Engineer's inspectors, or rude or abusive to any of the general public the person shall be removed from the work and not again be employed upon the work without the consent of the Engineer.

B. The Contractor shall provide needed and approved equipment in good repair, to do any and all work specified and required as well as sufficient qualified workmen, as required and he shall prosecute the work diligently at all times and shall maintain the workspace in a clean and safe condition during the entire performance of this contract.

C. The Contractor shall and will perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings covered by this contract any and all supplemental plans and drawings, and in accordance with the directions of the Engineer as given from time to time during the progress of this work. The Contractor shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

D. The Contractor shall observe, comply with and be subject to all terms, conditions, requirements, and limitations of the contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Engineer and the Owner.

6. CODES AND STANDARDS

A. All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations.

In case of difference between building codes, specifications, state laws, local ordinances, industry standards and utility company regulations and the contract documents, the most stringent shall govern. The Contractor shall promptly notify the Engineer in writing of any such differences. If extra compensation is claimed because of such differences it shall be negotiated and resolved before the work is done.

When applicable regulations, codes and standards have been revised or superseded, the revision, edition or expression in effect at date of advertisement for bids shall govern the work.

B. NON-COMPLIANCE. Should the Contractor perform any work that does not comply with the requirements of applicable building codes, state laws, local ordinances, industry standards, and utility company regulations, the Contractor shall bear all costs arising in correcting the deficiencies.

C. APPLICABLE CODES AND STANDARDS. Applicable codes and standards shall include all state laws, local ordinances, utility company regulations, and the applicable requirements of national and state-accepted codes and standards; including, but not limited to the following:

1. Building Codes
   UBC - Uniform Building Code
   UPC - Utah Plumbing Code
   UOSHA - Utah Occupational Safety and Health Rules and Regulations - General Standard

2. Industry Standards, Codes and Specifications
   AASHTO - American Association of State Highway and Transportation Officials
   ACI - American Concrete Institute
   AGA - American Gas Association
   AISC - American Institute of Steel Construction
   AISI - American Iron and Steel Institute
   AMCA - Air Moving & Conditioning Association
   ANSI - American National Standards Institute
   ASHRAE - American Society of Heating, Refrigeration & Air Conditioning Engineers
   ASME - American Society of Mechanical Engineers
   ASTM - American Society of Testing and Materials
   AWWA - American Water Works Association
   AWS - American Welding Society
   CRSI - Concrete Reinforcing Steel Institute
   NBS - National Bureau of Standards
   NEC - National Electrical Code
   NEMA - National Electrical Manufacturers Association
   NEPA - National Fire Protection Association
   PCA - Portland Cement Association
   SMACNA - Sheet Metal & Air Conditioning Contractors National Association
   UL - Underwriters Laboratories, Inc.

7. INSPECTION AND TESTS

A. All work and materials, and the manufacture and preparation of such materials from the beginning of the construction until the final completion and acceptance of the herein proposed work shall be subject to the inspection and rejection of the Engineer or the Engineer's representative at such times as may suit the Engineer's convenience and no material shall be used until proper tests and approvals have been given. As soon as the materials have been inspected and tested, the Contractor shall immediately remove all rejected materials from the work, and to such a point distant therefrom as the Engineer may require. The Contractor shall furnish, at the Contractor's own expense, such labor as may be required to enable a thorough inspection and culling of all materials, as proposed to be used, in sufficient amounts as required to make proper tests.

B. The Contractor shall make application for an inspector at least twenty-four (24) hours before the Contractor's services are required.

C. All inferior or imperfect work or materials that may be discovered before the completion and acceptance of the herein proposed work shall be corrected immediately upon the order of the Engineer, notwithstanding that it may have been overlooked by the Engineer or the Engineer's representative, and it are hereby expressly agreed that the inspection by the Engineer shall not relieve the Contractor of the Engineer's liability to furnish materials and workmanship in accordance with the specifications.

D. The Contractor and the Contractor's Superintendent and foreman shall promptly obey and follow every order or direction which shall be given by the Engineer in accordance with the terms of the contract.

E. Inspectors shall at all times be free to perform their duties, and any intimidation of any inspector on the part of the Contractor or the Contractor's employees shall be sufficient reason, if the Engineer desires, to annul the contract or remove the employee.

F. No materials shall be used before being inspected and approved by the Engineer, but the failure or neglect on the part of said Engineer to condemn or reject inferior materials or work shall not be construed to imply an acceptance of the same should their inferiority become evident at any time prior to the final acceptance of the work.

G. The Engineer and Owner, by reserving the right to inspect the doing of any work shall not have control of the Contractor's workers, methods of doing the work, or safety of the work or workers, but such inspection shall be limited to the control necessary to assure that the final results will fully comply with the Engineer or the Owner shall in no way excuse the Contractor from fully complying with the contract documents, drawings and specifications.

H. Test shall be required to determine suitability of materials, equipment and workmanship.

The Contractor shall provide certificates showing that items of equipment and materials have been sampled, inspected and tested when the product is completed off the site.

The Owner shall provide for sampling and testing of materials and workmanship performed on the site.

As examples of the division of responsibility, the following table may be used as a guide.

CONTRACTOR	OWNER
Concrete aggregates	Concrete slump
Concrete water	Concrete strength
Concrete cement	Soil density
Reinforcing steel	Pipe alignment
Pipe-strength	Paint thickness
Pipe leakage	Soil gradation (local material)
Machinery	
Paint content	
Electrical materials	
Soil gradation (imported or offsite borrow)	

These examples shall serve as a guide to the division of responsibilities for sampling and testing, and shall govern unless specific responsibilities are given elsewhere in these specifications.

8. SUBMITTAL OF SHOP DRAWINGS AND RELATED DATA

A. Prior to fabrication and in ample time to permit satisfactory progress of the work, the Contractor shall submit shop drawings and related data covering equipment and fabricated materials to the Engineer for review. Submittal shall be in such detail as the Engineer may require for informing himself in regards to design, installation and operation of the items covered. Two copies shall be submitted for preliminary review, and six copies for final review.

B. Submittal not bearing Contractor's certification that he has reviewed, checked and approved the drawings and that they are in conformance with the requirements of the Contract Documents will not be reviewed by the Engineer.

C. Corrections or comments made on shop drawings during Engineer's review shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Engineer will check and review only for general conformance with the design concept of the project and general compliance with information given in the Contract Documents. The Contractor shall be responsible for: conforming and correlating a;; quantities and dimensions; fabrication processes and techniques of construction; coordination of work with that of all other trades; and the safe and satisfactory performance of his work.

D. The Contractor shall require all suppliers of materials and equipment to include with their submittal a written statement that the materials and equipment being furnished are suitable and proper for intended installation, that the supplier has investigated the intended use, and that the items will satisfactorily perform an operate in the installation.

E. Drawings if minor manufactured items may not be required by the Engineer; however, the Contractor shall furnish to the Engineer tabulated lists of such items, showing manufacturer's catalog data, together with samples or general data, as may be required to permit determination as to their acceptability for incorporation in the work.

F. The Contractor, at the Contractor’s own expense, shall make such changes in the fabrication and equipment drawings as may be found necessary by the Engineer to make the same conform to the Contract Documents. Prior to review and acceptance of such drawings by the Engineer, any work which the Contractor may do on that portion of the work is at the Contractor’s own risk; the Owner will not be responsible for any expense incurred by the Contractor for changes to make work conform to the drawings as finally accepted.

G. The Contractor shall furnish complete operation, maintenance and lubrication instructions in triplicate covering all equipment, materials and supplies used in the work. Installation of equipment shall not begin until these instructions have been supplied to the Engineer.

9. SELECTION OF MATERIAL

A. Materials or equipment noted on the drawings and in specifications by the trade or manufacturer's name are so designated primarily to establish standards of quality, finish, appearance, ruggedness of construction, and performance. It is not the intent to limit the choice of materials and equipment to the specific product designated.

B. The Contractor will be allowed to submit requests to substitute equal items of equipment and material for those items which the Owner has not expressed a designated type and manufacturer in the award of the contract.

C. Such requests shall be made in writing, and shall be accompanied by complete data on which the Engineer may make determination on the merits of the proposed substitution. The written request shall state how the product proposed for substitution compares with or differs from designated product in composition, size, arrangement, performance, etc., and shall show conclusively that the proposed substitute is equal in all respects to that which is shown on the drawings or specified. If, in the opinion of the Engineer, the proposed product is equal to or better than the designated product, it may be approved for use, subject, however, to all applicable provisions of the specifications. Such opinions and approval must be in writing.

D. When the bidder is required to submit alternate bids on items of equipment as manufactured by three different manufacturers, he shall submit bids on equipment manufactured by at least two of the manufacturers listed and may submit a bid on equipment made by a third manufacturer selected by the Contractor. The final selection of equipment for the work will be based on quality, conformity to the specifications, efficiency, past experience, maintenance and cost. The Owner on recommendation of the Engineer will select the item and manufacturer and award the contract based on this selection.

E. Where alternate bids are required for equipment or materials manufactured from different materials or by different processes, the bidder shall submit bids on a minimum of three of the alternates except where less than three alternates are requested.

F. Selection will be based on the bid price of the alternate as well as an analysis of total contract cost, quality, efficiency maintenance and other features of the work which may be affected by the selection of that alternate.

G. The bidder shall submit bids on all alternates so that the Engineer can make a complete analysis of the bid.

H. All requirements of the specifications must be adhered to and all modifications shall be made in the article specified by trade name, type or model of manufacturer's equipment to make it conform to the specific requirement of the specifications.

I. Materials of a general description shall be the best of there several kinds, free from defects and adapted to the use for which provided.

J. The physical characteristics of all materials not particularly specified shall conform to the latest standards published by the American Society for Testing and Materials, or other recognized standards where applicable.

K. On all questions concerning acceptability of materials, classification of materials, execution of the work, and the determination of costs, the decision of the Engineer shall be final and binding upon all parties.

10. SURVEYS

A. General. The Engineer, at the Owner's expense, will establish alignment and grade data in the minimum amount described herein, as applicable to a given project, for execution of the work.

The Engineer's survey crews will not be available at all times for the work. The Contractor shall notify the Engineer at least 48 hours ahead of the time surveys will be required. The contractor shall keep the engineer advised on a current basis of construction survey requirements so that survey work may be coordinated with the Contractor's sequence of operations.

It is the intent of the Owner and the Engineer to check alignment and grade of the various parts of the project from time to time.

The contractor shall without additional costs, give such assistance and provide such ladders, lights or other equipment as may be required in establishing and checking lines and grades.

B. CONTRACTOR'S RESPONSIBILITY. Prior to commencement of work under this project, the subdivider shall establish lot corner stakes showing plan and elevation reference to curb and gutter, and sidewalks.

C. Location and Quantity of Alignment and Grade Data to be Provided by the Engineer. Additional stakes shall be provided by the engineer where the engineer determines that lot corner stakes established by the subdivider are insufficient to adequately define line and grade, such as at intersections, and beyond the limits of the subdivision. More particularly, alignment and grade data shall be provided to include the following:

(1) Sanitary Sewer / Storm drain lines. Offset and depth of cut measurements for sewer lines will be provided for laser instrument setting at manholes, 50-feet therefrom, at the midpoint of the span between manholes, and at the next manhole. If laser instruments are not used, see subparagraph "Contractor's Responsibility".

(2) Waterlines. Offsets to waterlines and appurtenances in subdivisions will be referenced from lot corner or curb and gutter stakes. For waterline extensions beyond subdivision boundaries, line stakes shall be provided at valves, bends, hydrants, specials and at not to exceed 100-feet.

(3) Curb & gutter / Sidewalk. Offsets to the curb & gutter will be provided at 25 foot intervals and at all radius points, change in grade and termination points.

D. Contractor's Responsibility.

(1) The Contractor shall transfer line and grade from the stakes or marks referred to above, to the work, and shall be responsible for the accuracy of the measurements from the stakes or marks to the work.

(2) Where laser instruments are not used to maintain alignment and grade stakes as required for proper execution of the work. These additional stakes shall be established from the control stakes provided by the Engineer. When the Engineer is requested to provide this additional staking for the Contractor, the Engineer shall be reimbursed and the extra cost shall be paid by the Contractor.

Also, where string line is used to maintain grade instead of laser equipment, the Contractor shall at all times have a minimum of 150-feet of string line stretched ahead of the work and 100-feet behind.

(3) The Contractor shall be responsible for the accuracy of all stakes for alignment and grade established by the Contractor.

(4) The Contractor shall be responsible for the protection of all control stakes established by the Engineer. The Engineer shall be reimbursed for re-establishing stakes or bench marks that have been disturbed or destroyed for any reason and the extra cost shall be paid by the Contractor.

(5) The Contractor shall not disturb any survey monuments found in the line of the work unless written authority to do so is given by the Engineer. Cost incurred by the Engineer in replacing monuments that have been disturbed by the Contractor without written approval shall be paid by the Contractor.

(6) Finish grade elevations for manholes, inlet and clean out boxes, fire hydrants, etc. will be transferred from property corners and curb elevations, or as directed by the Engineer.

11. PROPERTY LIABLE TO DAMAGE

A. The Contractor shall be liable for all damage, caused by the Contractor's own negligence to water, gas, steam or other pipes, ducts, cables, flumes, poles, or conduits, or other property owned by any person, corporation or the Owner. The Contractor shall repair or replace, as directed by and to the satisfaction of the Owner and Engineer, all water, sewer, irrigation, drainage or other pipes, flumes, conduits, hydrants, poles, or other property of the Owner or others which may be injured or damaged by reason of the negligence or carelessness of the Contractor or any of the Contractor's agents, servants, employees or subcontractors. If the Contractor shall fail or neglect to make such repairs or replacements within ten days after being notified by the Engineer so to do, then the Owner may make repairs or replacement of property so injured or damaged, and the cost of so doing may be deducted from any sum due or to become due the said Contractor under this contract. If the repairs are determined by the Engineer to be of an emergency nature, the Contractor shall not be allowed ten days to complete repairs or replacements but rather shall immediately make necessary repair or replacement.

B. The Contractor shall take all possible care to avoid grass or forest fires and shall assume responsibility for damage caused by any fire caused by the Contractor's construction operations.

C. When excavating in the vicinity of buried utilities, the Contractor shall take special precautions, including but not necessarily limited to using metal detectors and hand excavation to minimize damage to such utilities.

12. MOVING PROPERTY OF PUBLIC UTILITY

In case the Engineer, acting on application by the Contractor, determines that it is necessary to move the property of any public utility or franchise, the public utility or franchise will be notified by the Engineer to move the property within a specified reasonable time, and the Contractor shall not interfere with the property until after the expiration of the time specified, and then only as approved by the Engineer.

13. DAMAGE TO UTILITIES

The Contractor shall immediately notify the utility company, department or person involved and satisfactorily repair or replace any utility which is damaged or broken due to the execution of the work under this contract or arrange for the utility to perform the work. If the Contractor fails or neglects to make, or replacements immediately, then the Owner may make the necessary repairs and the cost of so doing will be deducted from the sum due or to become due the said Contractor under this contract.

14. CLAIM FOR DAMAGE

The Contractor shall not be entitled to any claim for damage on account of hindrance or delay from any cause whatever, but if occasioned by an act or omission on the part of the Owner, such hindrance or delay may entitle the Contractor to an extension of time in which to complete the work, which shall be determined by Owner, provided, that the Contractor shall give notice in writing of the cause of such delay. No extra time will be given for time elapsing before such notice is given.

15. PROPERTY REMOVED UNDER THE CONTRACT TO REMAIN THE PROPERTY OF ITS OWNER

All castings, grates, special fittings, hydrants, valves, valve boxes, pipe, poles, wire, building material, or other items removed during progress of the work, which in the Engineer's opinion have value to its Owner shall remain the property of its Owner and must be delivered to its Owner at such point on or near the site of the work as the Engineer may direct.

16. SAFETY STANDARDS AND ACCIDENT PREVENTION

A. With respect to all work performed under this contract the Contractor shall:

(1) Comply with the safety standards provisions of applicable laws, building and construction codes, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America and State Safety Regulations, the General Safety Orders Covering Utah Industries as published by Industrial Commission of Utah, the OSHA standards as they apply, safety standards as required by the Department of Transportation and City or County Highway Department.

(2) The Contractor shall exercise every precaution at all times for the protection of persons (including employees) and property which shall include, as needed, the use of shoring, bracing, barricades, guards, night watchmen, red lighting and the elimination of hazardous conditions.

(3) The Contractor shall maintain at the Contractor’s office or other well-known place at the job site, all articles necessary for giving first aid to the injured; and shall have an employee who has completed the American Red Cross Standard First Aid Course or its equivalent, and standing arrangements for the immediate removal to a hospital for a doctor's care of persons (including employees) who may be injured on the job site. On job sites on which less than 10 employees are working, a standard first aid kit equipped to serve 10 to 25 people, may be substituted for the above requirements. However, in no case, shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or doctor's care.

17. OBSTRUCTION AND GUARDS

A. The Contractor shall erect and maintain good and sufficient guards, barricades, light and signals at all unsafe places at or near the work, and shall in all cases maintain a safe passageway.

B. In the event the work under this contract may become hazardous to traffic or pedestrians, then the Contractor shall furnish, without added cost to the Owner, such flagmen as required to direct and control traffic during such emergencies and until such hazards have been corrected.

18. CLEANING UP AND JOB SHUT-DOWN

A. Immediately upon the completion of the work on each section of the work as determined by the Engineer, the Contractor shall, at the Contractor's own expense, clean up and remove all refuse materials of every kind resulting from the work, and upon failure to do so within twenty-four (24) hours after having been notified by the Engineer, the work may be done by the Owner and the cost thereof deducted from the amount of the Contractor's final payment. The Engineer will not make the final inspection until all of the work contemplated by the contact has been completed and the final cleaning up performed.

B. If in the judgment of the Engineer, it is necessary to close down the work due to inclement weather or due to circumstances arising during the progress of the work that may be construed to be dangerous or due to non-compliance with the specifications, the Contractor shall comply and stop all operations upon written notice from the engineer to do so and the work shall remain closed down until further orders in writing are given by said Engineer to the Contractor to proceed with the work of the project, and there shall be no claim against the Owner or Engineer for such action on the part of the Engineer.

C. If, for any reason whatsoever the work is closed down temporarily, then the Contractor shall clean up all of the finished work and shall provide protection as provided in Paragraph "Protection of Work During Shut-Down," and all other work under construction shall be cleaned up, material on hand shall be properly stored and made safe from damage or loss and to the satisfaction of the Engineer.

(1) The Contractor shall be responsible to see that the job is kept and maintained in a satisfactory condition during the entire time the work is closed own, roadways shall be made passable for local and emergency traffic at all times, and the Contractor shall be responsible for all materials, tools, and equipment entrusted to the Contractor's care from damage, or theft, and for its safety during the time the work is closed down, as well as throughout the entire performance of the work under this contract.

(2) Failure of the Contractor to comply with the above provisions during temporary shutdown of the work will be just cause for the Owner to do the required work, and the cost deducted form the final amount due the Contractor.

19. PREFERENCE TO LOCALLY PRODUCED MATERIALS

The Contractor agrees that preference shall be given to locally produced materials and that foreign made items or items made using foreign materials shall not be used unless no source for items made in the U.S.A. exists.

20. EMERGENCIES

Emergencies may arise during the progress of the work which may require special effort or require extra shifts or men to continue the work beyond normal working hours. The Contractor shall be prepared in case of such emergencies from whatever cause to do all necessary work promptly, and at no additional cost to the Owner.

21. PROTECTION OF WORK DURING SHUT-DOWN

The Contractor shall be responsible at all times during the construction period, or during the time the work is closed down for any reason, for the safety of all persons, materials, tools, equipment, etc. from theft, damage or injury to any of them or for damage done to the work that may be caused by the Contractor's neglect or the neglect of the Contractor's agents or employees, or by not keeping proper watch. The responsibility for the above, as well as providing competent watchmen at the job site, remains with the Contractor until such time as the work is completed, accepted by and turned over to the Owner for operation.

22. EQUIPMENT AND MATERIALS

All materials and equipment for installation shall be new and shall bear the manufacturer's name, trade name and the UL label, ASME stamp or other symbols of approval in every case where a standard has been established for the particular material. The equipment and material to be furnished under each Section of the specification shall be essentially the standard product of a manufacturer regularly engaged in the production of the required type of equipment or material, and shall be the manufacturer's latest approved design.

A. Equipment and Materials of the Same General Type. Equipment and materials of the same general type shall be of the same make throughout the work to provide uniform appearance, operation and maintenance.

B. Protection. Equipment shall be tightly covered and protected against dirt, water and chemical or mechanical injury or theft. At the completion of the work, fixtures, equipment and materials shall be cleaned and polished thoroughly and turned over to the Owner in a condition satisfactory to the Engineer. Damage or defects developing before acceptance of the work shall be made good at the Contractor's expense.

C. Dimensions. It shall be the responsibility of the Contractor to insure that items to be furnished fit the space available and shall make necessary field measurements to ascertain space requirements, including those for connections, and shall furnish and install such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the drawings and specifications.

23. SANITATION

A. The Contractor shall be fully responsible for the conduct of workers and the workers of all Subcontractors on the project. The Contractor will see that proper sanitary facilities are available and that all workers are notified of the location of said facilities. Any worker committing any nuisance outside proper facilities will be cause for suspension of the whole work until the situation has been corrected to the complete satisfaction of the Engineer.

B. On projects where facilities are not readily available the Contractor shall provide and erect a chemical or marine type toilet at a point to be approved by the Engineer, for the use of Contractor's employees and other personnel on the construction. No use shall be made of dug hole privies. Following the period of necessity for such toilet, it shall be removed completely.

C. Chemical toilet shall be of the approved type. The Contractor shall furnish all materials for said toilet and erect same at the Contractor’s sole cost and expense, and he shall maintain and remove the same upon completion of the need for its use wherever it is located.

24. COORDINATION OF WORK

A. The Contractor shall review the drawings and specifications and shall report any discrepancies to the Engineer and get written instructions for changes necessary to avoid interference. Before installation, the Con-tractor shall make proper provision to avoid interference in a manner approved by the Engineer. All changes required in the work of the Contractor caused by the Contractor’s neglect to do so shall be rectified by the Contractor at the Contractor’s own expense.

B. If, through acts of neglect on the part of the Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or Subcontractor by agreement or arbitration if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and safe harmless the Owner against any such claim.

25. QUANTITIES OF ESTIMATE

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

26. COMPLIANCE WITH LAWS AND REGULATIONS

The Contractor shall comply, and require any subcontractors to comply, with the current provisions of Utah Code Ann. Sec. 34-30-1 et seq.; specifically but not limited to provisions of Utah law relating to hiring practices, payment for overtime, and preparation and preservation of payroll records.

Failure by the Contractor to comply with these requirements will be considered as a breach of this contract, in addition to other penalties provided by Utah law. If the provisions of Utah Code Ann. Sec. 34-30-1 are not complied with, this contract shall be void.

27. PARTIAL PAYMENTS AND ESCROW ACCOUNTS

A. Partial Payments. Payment of monthly partial payment estimates submitted by the Contractor as described in the GENERAL CONDITIONS must, in most instances, be approved by the Owner at a regularly scheduled monthly meeting. The payment submittal schedule for 2023 is as follows:

Submittal date	Payment date	Submittal date	Payment date
January 6	January 27	February 3	February 24
March 3	March 24	April 7	April 28
May 5	May 26	June 2	June 23
July 7	July 28	August 4	August 25
September 1	September 29	October 6	October 27
November 3	November 24	December 1	December 29

B. Retainage Escrow. The provisions of Article 19 of the GENERAL CONDITIONS with respect to retainage on partial payments are hereby modified for public projects. In order to comply with the Utah State law enacted in 1983 requiring escrow account in a manner acceptable to the Owner for the purpose of holding the Contractor's retainage. The Owner will issue two checks for each partial payment; one check to the Contractor for work completed less retainage, and the second check for retainage to the Escrow Account.

The Owner will make arrangements with the successful Bidder with respect to either the establishment of the Escrow Account or Waiver of the requirement by the Contractor, prior to giving "Notice to Proceed."

The Owner reserves the right to alter this procedure in any manner in accordance with the Utah State legislation governing escrow accounts.

C. Final Payment. As a condition for completion and final acceptance of the work by the Engineer and the Owner, the Contractor and the Contractor’s surety shall certify that the final payment request submitted by the Contractor is correct and will constitute payment in full when paid, that the Contractor waives the right to make any additional claims, and that all work has been performed in accordance with the contract documents.

28. PAYMENTS BY CONTRACTOR

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar months following that in which services are rendered; (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used; and (c) to each of the subcontractors, not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by the Subcontractors to the extent of each Subcontractor's interest therein.

29. "AS-CONSTRUCTED' DRAWINGS

Before final acceptance, the Contractor shall provide the Engineer with a set of full size prints which have been marked to show the location of concealed portions of the project including: manholes, Y’s, tees, laterals, clean outs on sewer pipelines;

manholes, valves, tees, crosses, elbows, meters and laterals on water pipelines; electric wire cable conduit location shall be properly plotted to scale and noted by station, offset and elevation.

These "As-Constructed" prints shall also show all elevations of buried or concealed features from the Engineer's datum as shown on the "Construction" drawings.

Contractor shall maintain these drawings on an up-to-date basis. The Engineer may call for "As-Constructed" drawings when a phase of the project is complete.

30. PRE-CONSTRUCTION CONFERENCE

Within ten (10) days after notification of contract award, the successful bidder together with any known principal subcontractors, will be required to attend a pre-construction conference at a time and place designated by the Owner. Subcontractors shall include, but not be limited to, major items of work, such as heating, electrical, plumbing and so forth.
The purpose of the pre-construction conference is to discuss, among other considerations, the responsibilities of the successful bidder and any Subcontractors.

31. GUARANTEE

A. The Contractor shall warrant and guarantee that the improvements provided and every part thereof will remain in good condition for a period of one year after the date of completion and conditional acceptance by the Owner. The guarantee period for road surfaces, asphalt trails and street improvements such as curb and gutter and sidewalk shall be three years. The date of Conditional acceptance shall be the date of approval, by the Owner, of the final estimate for the work as prepared by the Engineer. The Contractor agrees to make all repairs and/or replacements, for all defects in workmanship, materials and equipment during the guarantee period, ordinary wear and tear and acts of God accepted, without additional charge or cost to the Owner.

The Contractor shall maintain all equipment until the date of conditional acceptance, at which time the Owner will assume normal maintenance. It shall be the Contractor's responsibility to instruct the Owner in all correct maintenance procedures for all items requiring maintenance.

The Contractor also agrees that the performance and payment bond hereto attached shall remain in force until the conditions of this guarantee are fulfilled.

B. The determination of the necessity for repairs above mentioned rests entirely with the Owner, whose decision shall be final and obligatory upon the Contractor. If the termination of the said period of one or three years shall fall within the months of November, December, January, February or March, said months shall not be included in the computation of the said period of one or three years, but said period shall be held and understood to terminate on the 15th day of April next thereafter, unless otherwise permitted by the Owner. It is hereby expressly understood and agreed that the Owner shall not finally accept the work before the date specified above, and then only in the case that all necessary repairs have been made according to standard methods approved by the Engineer.

32. PHOTOGRAPHS

The contractor shall provide photographs of the work site including preconstruction photographs and periodic construction photographs. Submit a key plan of the construction area with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation. Submit unaltered, original, full-size images files within seven days of taking photographs. The digital camera shall have a minimum sensor resolution of 8 megapixels. Provide the following information for identification with each image description in file metadata tag: 1) Name of Project, 2) Name and contact information for photographer, 3) Date photograph was taken, and 4) Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction. All digital images shall be provided in JPG format, with minimum size of 8 megapixels. Preconstruction photographs shall be taken before commencement of demolition. Take photographs of project area, including existing items to remain during construction, from different vantage points. Periodic construction photographs shall be taken weekly, with timing each month adjusted to coincide with the cutoff date associated with each application for payment. Select vantage points to show status of construction and progress since last photographs were taken.

33. MATERIALS FURNISHED BY THE OWNER

The following items shall be furnished by the Owner.
CXT Restroom will be coordinated by the Owner.

34. BUILDING PERMITS

Obtain any necessary permits

SECTION 01 5639
TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Requirements:

1. Section 311000 “Site Clearing” for removing existing trees and shrubs.

1.2 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape or the average of the smallest and largest diameters at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.

B. Caliper (DBH): Diameter breast height; diameter of a trunk as measured by a diameter tape or the average of the smallest and largest diameters at a height 54 inches above the ground line for trees with caliper of 8 inches or greater as measured at a height of 12 inches above the ground.

C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and as indicated on Drawings.

D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

a. City responsibilities.
b. Contractor responsibilities.
c. Coordination of Work and equipment movement with the locations of protection zones.
d. Trenching by hand or with air spade within protection zones.
e. Field quality control.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of the following:

1. Organic Mulch: Sealed plastic bags labeled with composition of materials by percentage

of weight and source of mulch.
2. Protection-Zone Fencing: Materials Samples.
3. Protection-Zone Signage: Full-size Samples.

C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1.5 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1.6 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Stockpiled soil mixed with planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

1. Mixture: Well-blended mix of two parts stockpiled soil to one part planting soil.
2. Planting Soil: Planting soil as specified in Section 329115 "Soil Preparation (Performance Specification)."

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Soil pep mulch.

C. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements:

1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch (50-mm) maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches (2400 mm) apart. High-visibility orange color.

a. Height: 48 inches.

2. Gates: Swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones.

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.2 PREPARATION

A. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

B. Tree-Protection Zones: Maintain existing ground plane surface material (i.e. turfgrass or organic mulch) under trees indicated to be preserved on Drawings. If ground plane surface is to be modified in any way, install organic mulch inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. Apply 3-inch (50-mm) uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

3.3 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones in a manner that will prevent people from easily entering protected areas except by entrance gates.

1. Construction Zone Fencing: Install to comply with manufacturer's written instructions and as specified in this section.
2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Owner and Landscape Architect. Avoid damage to existing tree roots when installing posts.
3. Access Gates: Install one access gate per tree, or grouping of trees, to be preserved.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Owner and Landscape Architect.

C. Maintain protection zones free of weeds and trash.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Owner and Landscape Architect and remove when construction operations are complete and equipment has been removed from the site.

3.4 EXCAVATION

A. General: Excavate at the edges of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving" unless otherwise indicated.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones,

excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Do not allow exposed roots to dry out before placing permanent backfill.

3.5 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil backfill.
3. Cover exposed roots with burlap and water regularly.
4. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving."

B. Root Pruning at Edge of Protection Zone: Prune tree roots by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by Owner and/or Landscape Architect.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated by Owner and/or Landscape Architect.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).

B. Cut branches with sharp pruning instruments; do not break or chop.

C. Do not paint or apply sealants to wounds.

D. Chip removed branches and dispose of off-site.

3.7 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

C. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

D. All regrading within tree protection zones shall be coordinated with Owner and Landscape Architect prior to any work being performed. No exceptions.

3.8 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Owner and Landscape Architect.

1. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions, if required.
2. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Owner and Landscape Architect.

B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 01 5639

SECTION 02 4119
SELECTIVE SITE AND STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected site elements.
2. Salvage of existing items to be reused or recycled.

B. Related Sections include the following:

1. Division 01 Section "Summary" for use of premises**,** and phasing**,** and Owner-occupancy requirements.
2. Division 01 Section "Photographic Documentation" for preconstruction photographs taken before selective demolition operations.
3. Division 01 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.
4. Division 01 Section "Cutting and Patching" for cutting and patching procedures.
5. Division 01 Section "Construction Waste Management and Disposal" for disposal of demolished materials.
6. Division 02 Section "Structure Demolition" for demolition of entire buildings, structures, and site improvements.
7. Division 31 Section "Site Clearing" for site clearing and removal of above- and belowgrade improvements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1. Coordinate with Owner who will establish special procedures for removal and salvage.

1.5 SUBMITTALS

A. Qualification Data: For demolition firm.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's other tenants' on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Locations of proposed dust and noise control, temporary partitions and means of egress**,** including for other tenants affected by selective demolition operations.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
6. Means of protection for items to remain and items in path of waste removal from building.

C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

D. Pre-demolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 01 Section "Photographic Documentation." Submit before Work begins.

E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1. Comply with submittal requirements in Division 01 Section "Construction Waste Management and Disposal."

1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Pre-demolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

4. Review areas where existing construction is to remain and requires protection.
5. Review shoring plans and methods of shoring placement.

1.7 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the items to be salvaged by the owner. Coordinate other items with the architect.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work or have been removed by Owner under a separate contract.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes, and templates.

1. Comply with requirements specified in Division 01 Section "Photographic Documentation."
2. Before selective demolition make permanent record of measurements, materials, and construction details required to make exact reproduction.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

    a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes

to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Division 01 Section "Construction Waste Management and Disposal."

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their

original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.8 SELECTIVE DEMOLITION SCHEDULE

A. Coordinate with architect’s plans.

END OF SECTION 02 4119

SECTION 31 0700
GENERAL SITE CONSTRUCTION REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited to

1. General procedures and requirements for Site Work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 PREPARATION

A. Site Verification Of Conditions

1. 48 hours minimum prior to performing any work on site, contact Blue Stakes to arrange for utility location services.
2. Perform minor, investigative excavations to verify location of various existing underground facilities at sufficient locations to assure that no conflict with the proposed work exists and sufficient clearance is available to avoid damage to existing facilities.
3. Perform investigative excavating 5 days minimum in advance of performing any excavation or underground work.
4. Upon discovery of conflicts or problems with existing facilities, notify Architect by phone or fax within 24 hours. Follow telephone or fax notification with letter and diagrams indicating conflict or problem and sufficient measurements and details to evaluate problem.
5. Notify Owner of utilities a minimum of 48 hours prior to an work taking place.

3.2 PREPARATION

A. Protection

1. Spillage -

a. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways.
b. Remove spillage and sweep, wash, or otherwise clean project, streets, and highways.

2. Dust Control -

a. Take precautions necessary to prevent dust nuisance, both on-site and adjacent to public and private properties.
b. Correct or repair damage caused by dust.

3. Erosion Control -

a. Take precautions necessary to prevent erosion and transportation of soil downstream, to adjacent properties, and into on-site or offsite drainage systems.
b. Develop, install, and maintain an erosion control plan if required by law.
c. Repair and correct damage caused by erosion.

4. Protect site from fire caused by welding, cutting, smoking, or other sources of ignition.

B. If specified precautions are not taken or corrections and repairs made promptly, Owner may take such steps as may be deemed necessary and deduct costs of such from monies due to Contractor. Such action or lack of action on Owner's part does not relieve Contractor from responsibility for proper protection of the Work.

C. Fees

1. Contractor shall be responsible for all off site street cut fees, encroachment permit fees, and bonding associated with the construction of the proposed facility.

3.3 REPAIR / RESTORATION

A. Adjust existing covers, boxes, and vaults to grade.

B. Replace broken or damaged covers, boxes, and vaults.

C. Independently confirm size, location, and number of covers, boxes, and vaults which require adjustment.

3.4 FIELD QUALITY CONTROL

A. Notify Architect 48 hours prior to performing excavation or fill work.

B. If work has been interrupted by weather, scheduling, or other reason, notify Architect 24 hours minimum prior to intended resumption of grading or compacting.

C. Owner reserves right to require additional testing to re-affirm suitability of completed work including compacted soils which have been exposed to adverse weather conditions.

END OF SECTION 31 0700

SECTION 31 1000
SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Removing concrete, asphalt and fencing as indicated on demolition plan.
2. Removing above- and below-grade site improvements.
3. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:

1. Division 01 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security, protection facilities, and temporary erosion and sedimentation control procedures.

2. Division 02 Section "Structure Demolition" for demolition of structures, and site improvements.

3. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.

1.3 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings, according to Division 01 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.5 QUALITY ASSURANCE

A. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Utility Locator Service: Contractor is to notify and pay for utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earth Moving."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, sediment and erosion control Drawings, a sediment and erosion control plan, specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent**.**

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed

during removal.

3.3 UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

E. Removal of underground utilities is included in Division 21, Division 22, Division 26, Division 27, and Division 28 Sections covering site utilities.

3.4 SITE IMPROVEMENTS

A. Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction. Refer to project plans for improvements to be abandoned in place.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Sawcut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.5 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 31 1000

SECTION 31 2000
EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Refer to the Geotechnical Report titled for additional grading requirements. There is not a current geotechnical report available.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing sub-grades for retaining walls, stairs and landscaping.
2. Excavating and backfilling trenches for buried electrical utilities and pits for buried utility structures.

B. Related Sections include the following:

1. Division 01 Section Construction Progress Documentation and Photographic Documentation for recording pre-excavation and earthwork progress.
2. Division 01 Section “Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
3. Divisions 26 and 27 Sections for installing underground electrical utilities and buried electrical structures.
4. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above-grade and below-grade improvements and utilities.
5. Division 32 Section for finish grading, including placing retaining walls and concrete for stairs and mow strip.
6. Division 33 Section for installing underground utilities.

1.3 UNIT PRICES

A. Unit prices for earthwork are included in Division 01 Section "Unit Prices."

B. Quantity allowances for earthwork are included in Division 01 Section "Allowances."

1.4 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Course placed between the subbase course and hot-mix asphalt paving and post tension concrete tennis courts..

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: 1-1/2-inch minus washed gravel or crushed stone course around perforated collector pipe.

F. Drain Rock: Clean washed gravel, ¾-inch minis placed on top of geofabic, PVC liner and compacted road base and under crusher course. This part of drainage layer that removes water from "future" artificial turf.

G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices and changes in the work.
2. Bulk Excavation: Excavation more than 10-feet in width and more than 30-feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

H. Fill: Soil materials used to raise existing grades.

I. Structures: Slabs, curbs, and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.
2. Controlled low-strength material, including design mixture.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D698 or ASTM D1557 for each on-site and borrow soil material proposed for fill and backfill.

C. Blasting Plan: Not Allowed

D. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

1.6 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

B. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or AASHTO M 145 Soil Classification Groups A-1, A-2-4, A-2-5, and A-3, or a combination of these groups; free of rock or gravel larger than 3-inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Native rock crushed to meet the above requirements and free from significant porosity may also be used as satisfactory soils.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 or A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Aggregate Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed concrete and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-inch sieve and not more than 15 percent passing a

No. 200 sieve. Sand Equivalent of no less than 35.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve. (Cannot be straight sand).

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 3/4-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course (around perforated pipe): Narrowly graded mixture of washed or crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

2.2 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Low-density, self-compacting, flowable concrete material as follows:

1. Portland Cement: ASTM C 150, Type II.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch to 3/8-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94/C 94M.
6. Air-Entraining Admixture: ASTM C 260.

B. Produce low-density, controlled low-strength material with the following physical properties:

1. As-Cast Unit Weight: 30 to 36 lb/cu. ft. at point of placement, when tested according to ASTM C 138/C 138M.
2. Compressive Strength: 80 psi , when tested according to ASTM C 495.

2.3 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows when required by utility purveyor:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.

D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES – Not Allowed

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

    a. 24 inches outside of concrete forms other than at footings.
    b. 12 inches outside of concrete forms at footings.
    c. 6 inches outside of minimum required dimensions of concrete cast against grade.
    d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    e. 6 inches beneath bottom of concrete slabs on grade.
    f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Basins, Vaults or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatictired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons or vehicle with similar unit axel weight.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices and changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable subdrainage.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 03 Section "Cast-in-Place Concrete."

D. Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 12 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.

F. Place and compact initial backfill of subbase material or satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the utility pipe or conduit.

G. Backfill voids with satisfactory soil while installing and removing shoring and bracing.

H. Place and compact final backfill of satisfactory soil to final subgrade elevation.

I. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

J. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under walks and pavements, use satisfactory soil material.
2. Under steps and ramps, use engineered fill.
3. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 12-inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Reduce loose depths as needed to achieve required compactions.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698 or ASTM D 1557:

1. Paved Areas: Compact top 12" of subgrade and each layer of backfill or fill material at 95% maximum dry density for cohesive material or 92% relative dry density for cohesionless material. Scarify and moisture condition to within 2% of optimum moisture and recompact subgrade.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
3. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent if in landscaping areas or 95 percent if under structures, pavements, or walks.

3.16 GRADING

A. General: Uniformly laser grade areas within contract limits under this section, including adjacent transition areas, free of irregular surface changes. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Walks: Plus or minus 1 inch
2. Pavements: Plus or minus 1/2 inch

C. Finish surfaces free from irregular surface changes, and as follows:

1. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 1/4" above or below required subgrade elevation.
2. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/4" above or below required subgrade elevation. Provide final grades within a tolerance of 1/4" when tested with a 10' straightedge.
3. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.17 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase and base course under pavements and walks

as follows:

1. Place base course material over subbase course under hot-mix asphalt pavement and post tension concrete..
2. Shape subbase and base course to required crown elevations and cross-slope grades.
3. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
4. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
5. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698 or ASTM D 1557.

3.18 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
2. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length, but no fewer than 2 tests.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

B. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

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

END OF SECTION 31 2000

SECTION 31 5000
EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes temporary excavation support and protection systems.

B. Related Sections:

1. Division 01 Section "Construction Progress Documentation and Photographic Documentation" for recording preexisting conditions and excavation support and protection system progress.
2. Division 01 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
3. Division 31 Section "Dewatering" for dewatering system for excavations.

1.3 PERFORMANCE REQUIREMENTS

A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads, as needed.

1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Monitor vibrations, settlements, and movements.

1.4 SUBMITTALS

A. Shop Drawings: For excavation support and protection system.

B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements" Qualification Data: For qualified professional engineer.

D. Other Informational Submittals:

1. Photographs or Videotape: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the

absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.

2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.

    a. Note locations and capping depth of wells and well points.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:

    a. Existing utilities and subsurface conditions.
    b. Proposed excavations.
    c. Proposed equipment.
    d. Monitoring of excavation support and protection system.
    e. Working area location and stability.
    f. Coordination with waterproofing.
    g. Abandonment or removal of excavation support and protection system.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Architect no fewer than two days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Architect's, Construction Manager's, and Owner's written permission.

B. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

D. Tiebacks: Steel bars, ASTM A 722/A 722M.

E. Tiebacks: Steel strand, ASTM A 416/A 416M.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.

2. Fill voids immediately with approved backfill compacted to density specified in Division 31 Section "Earth Moving."

3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

B. Leave excavation support and protection systems permanently in place.

END OF SECTION 31 5000

SECTION 02 700
CURB AND GUTTER, SIDEWALKS, DRIVEWAYS AND WATERWAYS

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish all materials, equipment, miscellaneous tools, and labor to construct concrete curb and gutter, sidewalks, driveways and waterways as shown on the drawings, as described herein and as directed by the City.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Concrete - The concrete used in the construction of these structures shall be as specified in Section 03, using 1-inch maximum aggregate.

B. Reinforcement - Reinforcement shall be as shown on the drawings, and as specified in Section 03 210.

C. Joint Filler - Expansion joint filler shall be pre-molded bituminous impregnated fiber type, 1/2-inch thick, conforming to AASHTO Designation M-153 or AASHTO Designation M-213.

PART 3 EXECUTION

3.1 INSTALLATION

A. Concrete work shall be constructed and located as shown on the drawings and as described herein and as directed by the City.

B. Excavation and Backfill - Excavation and backfill for these structures shall be in accordance with applicable portions of Section 02 220.
   1. Where the subgrade material is unsatisfactory it shall be removed as directed by the City and replaced with "Borrow for Bedding".
   2. The Contractor as directed by the City shall dispose of all excavated material in excess of that required for backfill.

C. Curb and Gutter
   1. Description - This item shall consist of constructing monolithic concrete curb and gutter, both straight and radius sections conforming to the typical sections, line and grade shown on the drawings; and at the indicated locations, and as directed by the City, on a thoroughly compacted sub-base. The base shall be compacted as specified in Section 02 220.
   2. Joints, Finishing, and Ruling - Curb and gutter shall be constructed in sections ten (10) feet in length, except as otherwise provided, and each section shall be made in one continuous pour. The different sections shall separated from each other by a metal "half plate" not less than one-eighth (1/8) inch thick and cut to the true cross sectional dimension of curb and gutter. The plate shall not extend into the bottom 4 1/2" of the curb and gutter.
      a. The plates shall not be removed until after the concrete has taken its initial set. An expansion joint, filled with pre-molded joint filler 1/2-inch thick, shall be provided every 40 feet, and where new paving joins existing paving.
      b. Where length of the block or portion thereof, where curb and gutter is not divisible by 10 then the final section or sections shall be of such length as the City may direct. A joint shall always be installed between the regular section and the warped section at the ends of culverts.

c. The gutter shall be trowel finished. A tool shall be used for compression of the coarse aggregate about 3/8-inch into the concrete, thereby leaving the mortar of the concrete on the surface for towel finishing.

d. The face of the curb shall be given a smooth finish, true to line. Forms shall be stoutly constructed so as to permit spading of the concrete and still remain true to line and grade. The face form shall be removed as soon as the concrete has taken its initial set and the curb face shall be smooth trowel finished.

e. After finishing, the curb and gutter shall be ruled. The ruling shall be brought directly over the joint made by the plate.

3. Radius Sections - Curb and gutter radius sections shall be constructed where shown on the drawings and as directed by the City. The back of curb radius shall be as designated on the drawings and as directed by the City. The construction of radius sections shall be as specified herein.

D. Sidewalks

1. Description - This item shall consist of the construction of Portland cement concrete sidewalks, on a compacted base at the locations, to the line and grade and in conformity with the typical sections shown on the drawings, in conformity with these specifications and as directed by the City.

2. The base shall be compacted as specified in Section 02 220.

3. Construction - The sidewalks shall be constructed in one course of the thickness shown on the drawings. Forms shall be set true to line and grade and braced properly to resist movement during pouring operation. Forms shall have sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure, tamping and vibration without deflection from the prescribed lines. The surfaces of all forms to be in contact with the concrete shall be clean, rigid, tight, and smooth.
4. Joints, Ruling, and Finishing - Expansion joints, filled with pre-molded joint filler one-half inch thick shall be provided at approximately 40-foot intervals. Expansion joins shall also be placed where new paving joins existing paving, and at other places as indicated on the drawings.
5. Groove approximately one-quarter inch wide with neatly tooled edges and extending to at least one-quarter the depth of the slabs, shall be provided at intervals not exceeding five (5) feet. The top surface of the sidewalks shall receive a wood-float and broom finish. All longitudinal edges shall be neatly finished with an edging tool.

E. Concrete Waterways

1. Description - This item shall consist of the construction of Portland cement concrete waterway five feet wide on compacted base, at the locations, to the line and grade, and in conformity with the typical sections shown on the drawings; in accordance with these specifications, and as directed by the City.
2. Compacted base and earthwork shall be as specified in Section 02 220.
3. Construction - The waterways shall be constructed in one course of the thickness shown on the drawings and shall be reinforced with five #5 reinforcing bars installed as shown. Forms shall be set true to line and grade and braced properly to resist movement during pouring operation. Forms shall have sufficient strength and rigidity to hold the concrete and to withstand the necessary pressure, tamping and vibration without deflection from the prescribed lines. The surfaces of all forms to be in contact with the concrete shall be clean, rigid, tight and smooth.
4. Joints, Ruling and Finishing - Construction joints, formed with metal plates cut to the cross-section shown on the drawing, shall be made at approximately 10-foot intervals. Waterways shall be smooth trowel finished as specified for curb and gutter and warped to match the flow lines of the gutters as shown on the drawings and as directed by the City.

F. Driveways

1. Description - This item shall consist of the construction of driveways with driveway paving and round corner curbs, or curb-cut type driveways, to the width shown on the drawings, in conformity with the typical details shown; in accordance with these specifications and as directed by the City. Driveways shall be constructed on thoroughly compacted base; compacted as specified in Section 02 220.
2. Construction –
    a. Where driveways with round corner curbs are to be constructed, the entire area between the back of the gutter and the sidewalk line and to the width directed shall be paved in one course with concrete of the thickness shown. A curb conforming to that shown on the drawings shall be on each side of the driveway pavement. The radius of the back of curb shall be as shown.
    b. Forms shall be as described under "Sidewalks". Driveway pavement shall be rough float finished. Driveway curbs shall be finished in the manner described under "Curb and Gutter".
    c. Where curb-cut type driveways are to be constructed, the curb of the curb & gutter shall be cut down to the limits shown on the drawings or as directed, and driveway pavement shall be placed between back of curb and the sidewalk line, or the surface of the sidewalk shall be warped if adjacent to back of curb, for the width and configuration as shown on the drawings and as described herein and as directed by the City.

3.2 REPAIRS AND MAINTENANCE

A. All repairs of curb and gutter, sidewalks, waterways, and driveways required to be made by the Contractor during the guarantee period shall be made with mixtures similar and equal to, and laid in the manner of those described in these specifications.

B. In addition to the proper maintenance of the pavement and other structures built under this contract during the period of guarantee, the Contractor shall, at the Contractor's own expense, just before the expiration of the guarantee period, make such repairs as may be necessary to produce pavements which shall:
    1. Conform substantially in contour to the pavements as first laid.
    2. Be free from cracks or depressions showing disintegration of the concrete mixture of the concrete pavement.
    3. Be free from all surface settlements holding water or other settlements showing a variation of three-eighths (3/8) inch or more from the edge of a four-foot straight edge.
    4. Whenever the repairs necessary to be made prior to expiration of the guarantee period in accordance with this section shall amount to more than fifty (50) percent of the surface of curb & gutter and sidewalk of any one block, the entire curb & gutter and sidewalk on that block shall be taken up and re-laid in accordance with these specifications.
    5. If more than fifty (50) percent of any driveway or waterway requires repairs, the entire structure shall be taken up, as directed by the City, and re-constructed in accordance with these specifications.

END OF SECTION 02 700

SECTION 32 1313
CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes exterior cement concrete pavement for the following:

1. Stairs.
2. Mow strips
3. Walkways.
4. Tactile Walkway surfaces

B. Related Sections include the following:

1. Division 03 Section "Cast-in-Place Concrete" for general building applications of concrete.
2. Division 31 Section "Earth Moving" for subgrade preparation, grading, and subbase course.
3. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants of joints in concrete pavement and at isolation joints of concrete pavement with adjacent construction.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Samples: 10-lb sample of exposed aggregate.

D. Qualification Data: For manufacturer and testing agency.

E. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

F. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

G. Field quality-control test reports.

H. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.

C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

D. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete producer.
d. Concrete pavement subcontractor.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves with a radius 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT (NO REINFORCEMENT USED FOR FLATWORK)

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

E. Plain Steel Wire: ASTM A 82.

F. Deformed-Steel Wire: ASTM A 496.

G. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

H. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

I. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

J. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing,

supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectricpolymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:

1. Portland Cement and as specified in Division 3 except that for exterior concrete, the minimum compressive strength is 5000 psi at 28 days.

B. Normal-Weight Aggregates: ASTM C 33, coarse aggregate, uniformly graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar pavement applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

1. Aggregate Sizes: 3/4 to 1 inch nominal.
2. Aggregate Source, Shape, and Color and as required by the architect.

D. Water: ASTM C 94/C 94M.

E. Air-Entraining Admixture: ASTM C 260.

F. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlappolyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

1. Products:

a. Axim Concrete Technologies; Cimfilm.
b. Burke by Edeco; BurkeFilm.
c. ChemMasters; Spray-Film.
d. Conspec Marketing & Manufacturing Co., Inc.; Aquafilm.
e. Dayton Superior Corporation; Sure Film.
f. Euclid Chemical Company (The); Eucobar.
g. Kaufman Products, Inc.; Vapor Aid.
h. Lambert Corporation; Lambco Skin.
i. L&M Construction Chemicals, Inc.; E-Con.
j. MBT Protection and Repair, ChemRex Inc.; Confilm.
k. Meadows, W. R., Inc.; Sealtight Evapre.
l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
n. Sika Corporation, Inc.; SikaFilm.
o. Symons Corporation; Finishing Aid.
p. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.

E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

1. Products:

a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
b. Burke by Edoko; Aqua Resin Cure.
c. ChemMasters; Safe-Cure Clear.
d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
f. Euclid Chemical Company (The); Kurez DR VOX.
g. Kaufman Products, Inc.; Thinfilm 420.
h. Lambert Corporation; Aqua Kure-Clear.
i. L&M Construction Chemicals, Inc.; L&M Cure R.
j. Meadows, W. R., Inc.; 1100 Clear.
k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
l. Symons Corporation; Resi-Chem Clear.
m. Tamms Industries Inc.; Horncure WB 30.
n. Unitex; Hydro Cure 309.
o. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

F. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

1. Products:

a. Anti-Hydro International, Inc.; AH Curing Compound #2 WP WB.
b. Burke by Edoco; Resin Emulsion White.
c. ChemMasters; Safe-Cure 2000.

d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
e. Dayton Superior Corporation; Day-Chem White Pigmented Cure (J-10-W).
f. Euclid Chemical Company (The); Kurez VOX White Pigmented.
g. Kaufman Products, Inc.; Thinfilm 450.
h. Lambert Corporation; Aqua Kure-White.
i. L&M Construction Chemicals, Inc.; L&M Cure R-2.
j. Meadows, W. R., Inc.; 1200-White.
k. Symons Corporation; Resi-Chem White.
l. Tamms Industries, Inc.; Horncure 200-W.
m. Unitex; Hydro White.
n. Vexcon Chemicals, Inc.; Certi-Vex Enviocure White 100.

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Color stain: Match Architect's sample or as selected by Architect from manufacturer's full range of stains.

C. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

D. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

E. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:

1. Types I and II, non-load bearing and types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

F. Chemical Surface Retarder: Water-soluble, liquid-set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch.

1. Products:

a. Burke by Edeco; True Etch Surface Retarder.
b. ChemMasters; Exposee.
c. Conspec Marketing & Manufacturing Co., Inc.; Delay S.
d. Euclid Chemical Company (The); Surface Retarder S.
e. Kaufman Products, Inc.; Expose.
f. Metalcrete Industries; Surftard.
g. Nox-Crete Products Group, Kinsman Corporation; Crete-Nox TA.
h. Scofield, L. M. Company; Lithotex.
i. Sika Corporation, Inc.; Rugasol-S.
j. Vexcon Chemicals, Inc.; Certi-Vex Envioset.

G. Pigmented Mineral Dry-Shake Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Products:

   a. Conspec Marketing & Manufacturing Co., Inc.; Conshake 600 Colortone.
   b. Dayton Superior Corporation; Quartz Tuff.
   c. Euclid Chemical Company (The); Surflex.
   d. Lambert Corporation; Colorhard.
   e. L&M Construction Chemicals, Inc.; Quartz Plate FF.
   f. MBT Protection and Repair, ChemRex Inc.; Mastercron.
   g. Metalcrete Industries; Floor Quartz.
   h. Scofield, L. M. Company; Lithochrome Color Hardener.
   i. Symons Corporation; Hard Top.

2. Color: Match Architect's sample or as selected by Architect from manufacturer's full range.

2.7 PAVEMENT MARKINGS

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type I or II or AASHTO M 248, Type N or F.

1. Color: White, Yellow, Blue. See Section 321216 for color locations.

B. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes.

1. Color: White, Yellow, Blue. See Section 321216 for color locations.

C. Glass Beads: AASHTO M 247, Type 1.

2.8 DETECTABLE WARNING TILES

A. Cast-in-Place Detectable Warning Tiles: Accessible truncated-dome detectable warning tiles configured for setting flush in new concrete walkway surfaces, with slipresistant surface treatment on domes and field of tile.

B. Manufacturers :
Cast Iron Panels as manufactured by
Duralast EJCo
Neenah Foundry
US Foundry

1. Color: Natural.
2. Shapes and Sizes:
   a. Rectangular panel, 24 by 24 inches, 24 by 30 inches and 24 by 36 inches . to suit conditions
3. Dome Spacing and Configuration: Manufacturer's standard compliant spacing
4. Mounting:
   a. Permanently embedded detectable warning tile

2.9 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 5000 psi
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45
3. Select slump limit from options in subparagraph below or revise to suit Project.
4. Slump Limit: 4 inches, plus or minus 1 inch.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normalweight concrete at point of placement having an air content as follows:

1. Air Content: 5-8 percent nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture, high-range, water-reducing admixture, high-range, water-reducing and retarding admixture, plasticizing, and retarding admixture in concrete, as required, for placement and workability.
2. Specify admixtures as part of submittal. Verify that admixtures proposed do not adversely effect stained concrete and will not modify colors of stain.
3. Coordinate acceptability of admixtures with architect.

F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.
3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

G. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. where specified and approved in mix submittal.

H. Color Stain: Add stain to concrete per manufacturers recommendations and to meet color required by architect and owner on areas of stained concrete.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete mixes of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete mixes larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatictired equipment to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons or similar axel weight vehicle.
3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Division 31 Section "Earth Moving."

C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
2. Provide tie bars at sides of pavement strips where indicated.
3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet, unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into

areas as indicated. Construct contraction joints for a depth equal to at least onefourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site.

F. Do not add water to fresh concrete after testing.

G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.

J. Screed pavement surfaces with a straightedge and strike off.

K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

L. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.

M. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.

N. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

O. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

P. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiffbristled broom, perpendicular to line of traffic.
4. Coordinate with architect the locations of each type of finish.

3.8 SPECIAL FINISHES

A. Pigmented Mineral Dry-Shake Hardener Finish: After initial floating, apply dryshake materials to pavement surface according to manufacturer's written instructions and as follows:

1. Uniformly spread dry-shake hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacturer to match pavement color required.
2. Uniformly distribute approximately two-thirds of dry-shake hardener over pavement surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with a second dryshake hardener application, uniformly distributing remainder of material at right angles to first application to ensure uniform color, and embed by power floating.
3. After final floating, apply a hand-trowel finish followed by a broom finish to concrete.
4. Cure concrete with curing compound recommended by dry-shake hardener manufacturer. Apply curing compound immediately after final finishing.

3.9 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.10 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/4 inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.11 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow concrete pavement to cure for 14 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Spread glass beads uniformly into wet pavement markings at a rate of 6 lb/gal.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. or 5000 sq. ft. or fraction thereof of each concrete mix placed each day.

    a. When frequency of testing will provide fewer than five compressive strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.13 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 1313

SECTION 32 1373
CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within cement concrete pavement.
2. Joints between cement concrete and asphalt pavement.

B. Related Sections include the following:

1. Division 07 Section "Joint Sealants" for sealing nontraffic and traffic joints in locations not specified in this Section.
2. Division 32 Section "Asphalt Paving" for constructing joints between concrete and asphalt pavement.
3. Division 32 Section "Concrete Paving" for constructing joints in concrete pavement.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

D. Qualification Data: For installer and testing agency.

E. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for sealants.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for

testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than six (6) pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing of current sealant products within a 36-month period preceding the commencement of the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 for testing indicated, as documented according to ASTM E 548.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
3. When joint substrates are wet or covered with frost.
4. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
5. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 COLD-APPLIED JOINT SEALANTS

A. Multi-component Jet-Fuel-Resistant Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:

1. Urethane Formulation: Type M; Grade P; Class 12-1/2; Uses T, M, and, as applicable to joint substrates indicated, O.

a. Available Products:

1) Pecora Corporation; Urexpan NR-300.
2) Engineer approved equal.

2. Coal-Tar-Modified Polymer Formulation: Type M; Grade P; Class 25; Uses T and, as applicable to joint substrates indicated, O.

a. Available Products:

1) Meadows, W. R., Inc.; Sealtight Gardox.
2) Engineer Approved Equal.

3. Bitumen-Modified Urethane Formulation: Type M; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

a. Available Products:

1) Tremco Sealant/Waterproofing Division; Vulkem 202.
2) Engineer approved Equal.

B. Single-Component Jet-Fuel-Resistant Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

1. Available Products:

a. Sonneborn, Div. of ChemRex, Inc.; Sonomeric 1.
b. Engineer Approved Equal.

C. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.

1. Available Products:

a. Crafco Inc.; RoadSaver Silicone.
b. Dow Corning Corporation; 888.
c. Engineer Approved Equal.

D. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutralcuring,

self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

1. Available Products:

a. Crafco Inc.; RoadSaver Silicone SL.
b. Dow Corning Corporation; 890-SL.
c. Engineer Approved Equal.

E. Multi-component Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, selfleveling sealant.

1. Available Products:

a. Meadows, W. R., Inc.; Sof-Seal.
b. Engineer Approved Equal.

2.4 HOT-APPLIED JOINT SEALANTS

A. Jet-Fuel-Resistant Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3569.

1. Available Products:

a. Crafco Inc.; Superseal 444/777.
b. Meadows, W. R., Inc.; Poly-Jet 3569.
c. Engineer Approved Equal.

B. Jet-Fuel-Resistant Sealant for Concrete and Tar Concrete: Single-component formulation complying with ASTM D 3581.

1. Available Products:

a. Crafco Inc.; Superseal 1614A.
b. Meadows, W. R., Inc.; Poly-Jet 1614.
c. Meadows, W. R., Inc.; Poly-Jet 3406.
d. Meadows, W. R., Inc.; Poly-Jet 3569.
e. Engineer Approved Equal.

C. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.

1. Available Products:
a. Crafco Inc.; Superseal 444/777.
b. Meadows, W. R., Inc.; Poly-Jet 3406.
c. Engineer Approved Equal.

D. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

1. Available Products:

a. Koch Materials Company; Product No. 9005.
b. Koch Materials Company; Product No. 9030.
c. Meadows, W. R., Inc.; Sealtight Hi-Spec.
d. Engineer Approved Equal.

2.5 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

2.6 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting jointsealant performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by jointsealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.

2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 32 1373

SECTION 32 8400
PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Piping.
2. Manual valves.
3. Automatic control valves.
4. Sprinklers.
5. Drip specialties.

1.2 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic operation with controller and automatic control valves.

B. Location of Drip Irrigation: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs, light fixtures, and structures. Major adjustments shall be coordinated with the Landscape Architect.

C. Field Verification: Locations of existing rotors and/or spray heads within existing turfgrass areas is unknown. The contractor is responsible for verifying the locations of all rotors and/or spray heads and modifying spray zones for turfgrass areas disturbed by demolition of existing conditions and construction of new site improvements, and ensuring 100 percent coverage of affected turfgrass areas.

D. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:

1. Circuit Piping: 150 psig.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to any facilities occupied by the Owner, or others, unless permitted under the following conditions and then only after arranging to provide temporary water service according to the requirements indicated:

1. Notify Owner and Landscape Architect no fewer than two days in advance of the proposed interruption of water service.
2. Do not proceed with interruption of water service without written permission from the Owner or Landscape Architect.

1.7 SCOPE

A. It is the intention of these specifications, together with the accompanying drawings to accomplish the work of installing a complete and fully functioning irrigation system which will operate in an efficient and satisfactory manner according to current industry irrigation standards.

B. The work consists of retrofitting the existing irrigation system and installing new irrigation as shown on the Drawings and described in these specifications. Include all labor, equipment and materials, and perform all operations in connection with the installation of the irrigation system.

C. It will be the Contractor's responsibility to report to the Owner and the Landscape Architect on Contractor company letterhead, any discrepancies between the Drawings, specifications, and site conditions prior to submitting the bid in sufficient time to allow the issuance of an addendum to the bid documents. Failure to do so will require the Contractor, at no additional cost to the Owner, to include any replacements and/or relocations necessary to complete a fully functional installation in full compliance with the contract documents, when such conditions were identifiable prior to the bid.

D. Irrigation layout shown on the drawings is generally diagrammatic. Minor adjustments to the layout shall be coordinated with the Landscape Architect.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. PE Pipe with Controlled ID: ASTM F 771, PE 3408 compound; SIDR 11.5 and SIDR 15.

1. Insert Fittings for PE Pipe: ASTM D 2609, nylon or propylene plastic with barbed ends. Include bands or other fasteners.

B. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.

1. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
3. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

2.2 PIPING JOINING MATERIALS

A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.3 MANUAL VALVES

A. Plastic Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by the

following:

a. Spears Manufacturing Company (basis of design).
b. Equal, as approved.

2.4 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:

1. Existing valve to be used, as indicated on Drawings.

2.5 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Plastic, Pop-up, Gear-Drive Rotary Sprinklers:

1. Match existing.

C. Plastic, Pop-up Spray Sprinklers:

1. Match existing.

2.6 DRIP SPECIALTIES

A. Description: Surface layout, point source drip irrigation components for trees and plants within planter areas. Drip specialties shall include the following:

1. Blank 17mm drip line tubing.
2. Plastic 17mm barbed fittings.
3. Self-piercing barbed emitters with pressure compensation, flow rates of .5 gph through 5 gph, and an operating pressure range of 10 psi to 50 psi.
4. 0.25” flexible, polymer blend distribution tubing.
5. Plastic distribution tubing stake.
6. Plastic diffuser bug cap.

B. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Netafim (basis of design).
2. Rain Bird Corporation (basis of design).
3. Equal, as approved.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving”, and as shown on Drawings.

B. Trenches shall be a minimum of 12 inches away from buildings, curbs, and sidewalks, and a minimum of 36 inches away from vehicle access pathways.

C. Where multiple pipes are to be installed in the same trench, each pipe shall be separated by a minimum distance of 4 inches.

D. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Circuit Piping: Minimum depth of 12 inches below finished landscape elevations, and minimum depth of 24 inches below finished hardscape elevations.
2. Sleeves: Not less than 24 inches below finished hardscape elevations.

3.2 PREPARATION

A. Set stakes to identify locations of new irrigation system. Obtain Landscape Architect's approval before excavation and installation.

B. Coordinate and install sleeves and wiring conduits under paved surfaces prior to installation of paved surfaces.

1. Sleeves for irrigation lines shall be a minimum of 4 inches in diameter or twice the size of the piping contained in the sleeve, whichever is greater.
2. Provide wiring conduit as follows:

a. (1) one 3/4-inch conduit for up to 5 wires.
b. (1) one 1 inch conduit for up to 8 wires.
c. (1) one 1-1/4 inch conduit for up to 15 wires.
d. (1) one 1-1/2 inch conduit for up to 20 wires.
e. (1) one 2 inch conduit for up to 30 wires.
f. (1) one 2-1/2 inch conduit for up to 35 wires.
g. (1) one 3 inch conduit for up to 40 wires.

3.3 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are coordinated with the Landscape Architect.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Lay piping on solid subbase, uniformly sloped without humps or depressions.

G. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are damaged.

D. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners according to piping manufacturer's written instructions.

E. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 SPRINKLER INSTALLATION

A. Install sprinklers after hydrostatic test is completed.

B. Install sprinklers at manufacturer's recommended heights.

C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries unless otherwise indicated.

D. Field verify the locations of existing rotors and/or pop-up spray heads within existing turfgrass areas and locate new rotors and/or pop-up spray heads to ensure 100 percent head-to-head coverage over existing and repaired turfgrass areas.

3.6 DRIP IRRIGATION INSTALLATION

A. Connect drip line to PVC laterals with 17mm male adapter. Seal all threads with Teflon tape.

B. Install drip line tubing on top of finish grade and completely cover with soil pep mulch. Lay drip line a maximum distance of 24 inches from trees and plants, and secure in place with rounded, 6 inch galvanized metal staples every 36 inches.

C. Insert point source drip emitters directly into drip line tubing, and run 1/4 inch distribution tubing on top of finish grade, but under soil pep mulch, to within 6 inches of the trunk flare of each tree and within 2 inches of the base of each plant. Secure each length of 1/4 inch distribution tubing in place with a plastic tubing stake and cap with a diffuser bug cap.

D. Install a manual flush valve at the end of each drip line branch.

3.7 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

D. Make adjustments to existing rotors and/or pop-up spray heads as necessary to avoid overspraying onto existing and new concrete paving and structures.

3.8 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Underground irrigation main piping, NPS 4 and smaller, shall be the following:

1. Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.

C. Circuit piping, NPS 2 and smaller, shall be the following:

1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

D. Underground Branches and Offsets at Sprinklers and Devices: Schedule 40, PVC pipe; socket fittings and solvent-cemented joints.

1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.

3.9 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Any irrigation product will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Walk Through for Substantial Completion: Following complete installation of the entire irrigation system, the contractor shall request a walk through for substantial completion with the Landscape Architect, at least seven (7) days prior to the anticipated walk through date. To prepare for this walk-through, the Contractor shall have all lids removed from valve boxes, and the system pressurized and ready for operation. The Contractor shall provide final as-built drawings to the Landscape Architect for review prior to beginning the walk through. The Walk Through for Substantial Completion shall consist of two parts;

1. Physical Walk Through: During this walk-through a comparison of each valve box and corresponding irrigation components will be made with the irrigation Drawings and details to note conformance to Drawings or lack thereof.
2. Operation Walk Through: Once the physical walk-through is completed, the entire irrigation system will be tested for operational conformance with the Drawings by having the Contractor turn on each valve station using the automatic controller in sequence as requested by the Landscape Architect, noting sequential and operation conformance to the Drawings. Valve station sequence testing will include existing valves that are connected to the existing controller, as well as new valves installed and connected to the existing controller.
   The Landscape Architect will prepare and provide a written punch list of any irrigation system components needing adjustment, replacement, and/or repair, and it will be the contractor's responsibility to completely remedy the punch list prior to requesting a final walk through or beginning the maintenance period.

F. Final Completion Walk-Through: Following completion of all items on the punch list provided by

the Landscape Architect at the walk through for substantial completion, the contractor shall request a final walk through with the Landscape Architect, at least seven (7) days prior to the anticipated walk through date. Once accepted, the Landscape Architect and the contractor will review only those items listed on the punch list provided at the walk through for substantial completion. In the event that the substantial completion punch list has not been fully completed, the final walk through will be canceled and the contractor shall be responsible for remedying all outstanding items on the punch list prior to making a second request for a final walk through. During the final walk through, only the items on the punch list for substantial completion will be reviewed, noting conformance or lack thereof.

END OF SECTION 32 8400

SECTION 32 9115
SOIL PREPARATION (PERFORMANCE SPECIFICATION)

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes planting soils specified according to performance requirements of the mixes.

B. Related Requirements:

1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
2. Section 329200 "Turf and Grasses" additional planting soil and fertilization.
3. Section 329300 "Plants" for placing planting soil for plantings.
4. Section 015639 "Temporary Tree and Plant Protection" for protection of existing trees to remain.

1.2 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

K. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Q. USCC: U.S. Composting Council.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Test Results: On laboratory letterhead, submit soil analysis test results for each source of onsite soil or imported planting soil. Submit results for each source prior to adding amendments and include laboratory recommendations for bringing soils into compliance with the requirements of this section. Also submit results for each source after adding amendments to confirm compliance with requirements of this section.

B. Product Data: For each type of product.

C. Soil Source: For imported soils, submit a report stating the location of the source and an account of recent use.

D. Samples: For each bulk-supplied material in sealed containers labeled with content, source, and date obtained; providing an accurate representation of composition, color, and texture.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in the types of tests to be performed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The full topsoil volume required to meet the project need shall be provided as part of the contract, regardless of whether on-site or imported soils are used.

2.2 PLANTING SOILS SPECIFIED ACCORDING TO PERFORMANCE REQUIREMENTS

A. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained and stockpiled on-site; or imported, naturally formed soil from off-site sources; modified to produce viable planting soil. Using preconstruction soil analyses and materials specified in other articles of this Section, amend soils to become planting soil complying with the following requirements:

1. Chemical Characteristics:

a. pH 5.5 to 8.0.
b. Soluble Salts: less than 3.0 dS/m.
c. Sodium Absorption Ratio (SAR): less than 6.0.
d. Organic Matter: not less than 5 percent.

2. Physical Characteristics: Gradation as defined by USDA triangle of physical characteristics as measured by hydrometer.

a. Sand: 15 to 60 percent.
b. Silt: 10 to 60 percent.
c. Clay: 5 to 30 percent.

3. Fragment Size Distribution: Soil shall not contain more than 2 percent by dry weight of rocks measuring over 3/32 inch in largest size.

4. Materials to be Removed:

a. Unacceptable Materials: Concrete, slurry, concrete layers or chunks, cement, plaster building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of course sand that exceed a combined maximum of 5 percent by dry weight of the soil.
c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1 inches in any dimension.

5. Soil Amendments: Incorporate soil amendments listed below as recommended in the results of the soils analysis report.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.

E. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Feedstock: Limited to leaves.
2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4 dS/m.

4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 30 to 40 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 1-inch sieve.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

D. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.5 FERTILIZERS

A. Superphosphate: Commercial, phosphate mixture, soluble.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium.

C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

PART 3 - EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Planting soil shall be placed at a depth of 6 inches in areas to receive turfgrass sod and a depth of 12 inches in all shrub, perennial, and groundcover planting beds.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.2 PREPARATION OF ON-SITE OR IMPORTED SOILS

A. General: Do not blend amendments if on-site or imported soils are frozen, muddy, or excessively wet.

B. Cleaning: Remove all unacceptable, unsuitable, and large materials defined in “Part 2-

Products".

C. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

D. Amending: Add amendments to on-site or imported soils as recommended in soil analysis results. Thoroughly blend amendments throughout to produce the required planting soil.

1. If required, mix lime and sulfur with dry soil before mixing fertilizer.
2. As required, mix fertilizer with planting soil no more than seven days before planting.
3. 3 PLACING AMENDED PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Do not till exposed subgrade or apply planting soil if subgrade or soils area frozen, muddy, or excessively wet.

B. Excavation: If rough grade elevations do not allow for required planting soil depth, excavate additional subgrade soils from designated planter areas and lawn areas to meet the depth required for each area, and legally dispose of excavated soil off Owner's Property at no additional cost to the owner. Do not reduce the planting soil depth required for planter areas and lawn areas to meet adjacent finish elevations.

C. Subgrade Preparation: Till excavated subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

D. Placing Planting Soil: Spread amended soil to the total depth required for the planting area, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

E. Lifts: Apply amended planting soil in lifts not exceeding 8 inches in loose depth for material compacted by compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests:

1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 1000 sq. ft. of in-place soil or part thereof.
2. Performance Testing: For each amended planting-soil type, demonstrating compliance with specified performance requirements.

C. Soil will be considered defective if it does not pass tests.

D. Label each sample and test report with the date, location keyed to a site plan or other location system, and sampling depth.

3.5 PROTECTION AND CLEANING

A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting

operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds or structures.
6. Impoundment of water.
7. Excavation or other digging unless otherwise indicated.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

C. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by the Landscape Architect and replace contaminated planting soil with new planting soil.

END OF SECTION 32 9115

SECTION 32 9200
GRASSES AND WILDFLOWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seeding.

1.2 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

F. Substantial Completion: The point in time when the Work is sufficiently complete, in accordance with the Contract Documents, that the Owner can occupy or use the Work for its intended purpose.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Certification of Grass and Wildflower Seed: From seed vendor for each grass and wildflower seed mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for grass and wildflowers. Include identification of source and name and telephone number of supplier.

B. Product Certificates: For fertilizers, from manufacturer.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful grass and wildflower seeding.
   1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

   2. Pesticide Applicator: State licensed, commercial.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Bulk Materials:

   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

1.7 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial establishment periods to provide required maintenance from date of planting completion.

   1. Spring Planting: on or near 15 March.
   2. Fall Planting: on or near 15 October.
   3. Days considered for the establishment period must be conducive to the growth and establishment of the sod and not non-growing seasonal months.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.9 CLEANUP

A. Upon completion of all seeding operations, the portion of the project site used for a work or storage area by the CONTRACTOR shall be cleaned of all debris, superfluous materials, and equipment. All such materials and equipment shall be entirely removed from the project site.

B. All walks or pavement shall be swept or washed clean upon completion of the WORK of this Section.

PART 2 - PRODUCTS

2.1 GRASS AND WILDFLOWER SEED

A. Grass and Wildflower Seed:
   1. Fresh, clean and dry seed species as indicated on Landscape Plan, "REVEGETATION SEED MIX".

B. The grass seed mixture shall meet the minimum tested requirements of ANA. The grass seed mix shall be the current year's crop, guaranteed by the supplier as follows:
   80% Germination Rate
   72% Purity and 80% pure live seed
   No more than 2% inert matter
   No noxious weeds and no weed seed

2.2 FERTILIZERS AND SOIL AMENDMENTS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

   1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.3 MULCH

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.

C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.4 TOPSOIL

A. All topsoil to be free of any subsoil earth clods, sods and stones over 1 inch in any dimension, sticks, toots, weeds, litter and other deleterious material. Topsoil shall be uniform in quality and texture and contain organic

matter and mineral elements necessary for sustaining healthy plant growth. Contractor shall strip, stockpile and screen a sufficient amount of existing and amended topsoil to place 4-inch thick to all seed areas.

2.5 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Project Manager and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 SEED AREA PREPARATION

A. All areas of fill, i.e., trenches, mounds, etc., shall be compacted and settled as specified in the Grading and excavation of sprinkler irrigation sections of this project before any topsoil is placed on areas to be seeded.

B. Any existing topsoil used in seed areas shall be loosened and pulverized to a depth of four (4) inches and all stones over one (1) inch in any dimension, sticks, roots, rubbish, or other extraneous matter, shall be removed from the premises. The surface will be fine graded so that when settled, the surface is free from depressions or ridges and will conform to the required grades indicated. The surface shall be smooth, loose, and of uniformly fine texture at the time of installation.

C. Any areas containing new topsoil shall be rolled by a hand roller on small areas. After rolling at a weight of 150-200 pounds per linear foot of roller, the bed shall again be graded to the specified grade with a smooth

surface. Large areas shall be final graded by passing a land plane in three different directions over the entire area to be planted.

D. The Contractor shall prepare no more ground than can be seeded in a twenty-four (24) hour period. Seed shall be placed within 24 hours of ground preparation. The ground shall be re-prepared if weather or traffic has compromised the friability of the prepared area.

E. No seeding shall be done immediately after a rain storm of if a prepared surface has been compacted without first loosening the surface to a smooth, loose, uniformly fine texture just prior to sodding.

F. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. The specified fertilizer shall be applied and incorporated into the upper four (4) inches of topsoil.

H. Before planting, obtain Project Manger's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Preparation" Article.

B. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h).
   1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   2. Do not use wet seed or seed that is moldy or otherwise damaged.
   3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate as indicated on Landscape Plan.

C. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with erosion-control mats as required; install and anchor according to manufacturer's written instructions.

E. Protect seeded areas from hot, dry weather or drying winds by applying mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch (4.8 mm), and roll surface smooth.

3.6 SEEDED AREA MAINTENANCE

A. Maintain and establish seeded area by watering, weeding, replanting, and performing other operations as required to establish a healthy, viable meadow. Roll, regrade, and replant bare or eroded areas and remulch. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials damaged or lost in areas of subsidence.
2. Apply treatments as required to keep revegetated area and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering:

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch.
2. Water revegetated area with fine spray at a minimum rate of 1/2 inch (13 mm) per week for four weeks after planting unless rainfall precipitation is adequate.

3.7 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Project Manager before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.8 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by seeding work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove non-degradable erosion-control measures after grass establishment period.

3.9 FINAL INSPECTION

A. Inspection of work of seeded areas will be made at conclusion of maintenance.

B. Within 10 days of the end of the establishment period written notice requesting an inspection shall be submitted to the Landscape Architect by the Contractor. All areas designated for seed shall be covered with a reasonable stand of grass acceptable to the Landscape Architect. All areas found not to be acceptable shall be re-seeded in accordance with the above re-seeding specifications. Such areas shall be maintained and guaranteed as stated above.

C. Final acceptance of the WORK prior to guarantee period of the contract will be accepted upon written approval by the Landscape Architect, on the satisfactory completion of all work, including maintenance, but exclusive of the replacement of plant material.

D. Any delay in the completion of any item of work in the seeding operation which extends the seeding into more than one season shall extend the maintenance in accordance with the date of completion.

E. The CONTRACTOR shall re-seed as soon as weather conditions permit, all bare areas or areas where the stand of grass is thin or not healthy.

F. All work done under this contract shall be left in good order to the satisfaction of the OWNER and the Landscape Architect and the CONTRACTOR shall, without additional expense to the OWNER.

3.10 FINAL ACCEPTANCE

A. Maintenance by the Contractor shall cease upon his receipt of written notice from the Landscape Architect and or Owner indicating final acceptance of the grass seed mix areas.

END OF SECTION 32 9200

SECTION 32 9300
PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plants.
2. Fertilizers.
3. Mulches.
4. Pesticides.
5. Root barrier.

B. Related Requirements:

1. Section 329115 “Soil Preparation (Performance Specification”.

1.2 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to the Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:

1. Mineral Mulch: 10 lbs. of each mineral mulch specified, in five gallon containers labeled

with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on-site; provide an accurate indication of color, texture, and makeup of the material.

2. Weed Barrier: 12 inches by 12 inches.

1.5 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape contractor whose work has resulted in successful establishment of plants.

1. Installer's Field Supervision: Require contractor to maintain an experienced full-time supervisor on Project site when work is in progress.

B. Pesticide Applicator: State licensed, commercial.

1. Pesticide Applicator: State licensed, commercial.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or on site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

B. Upon delivery and throughout the construction installation period, plants shall be sound, healthy, vigorous and free from pests and diseases. Plants shall be in full leaf, well branched, and have a healthy root system. All plants shall be nursery grown and conform to the species and size specified in the planting legend.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball or container.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

F. Trees and shrubs must be covered with a protective tarp to protect from wind and other damage during transportation.

G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than eight hours after delivery, set plants and trees in their appropriate solar aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Set balled and burlapped stock on ground and “heel-in” root balls with soil, peat moss, sawdust, or other acceptable material. Do not allow balled stock to fall or blow over.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.9 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
b. Structural failures including plantings falling or blowing over.

2. Warranty Periods: From date of Substantial Completion.

a. Guarantee trees to live and remain in strong, vigorous, and healthy condition for 12 months.
b. Guarantee shrubs, groundcovers, flowering perennials, and ornamental grasses to live and remain in strong, vigorous, and healthy condition for 12 months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace, unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Planting Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4" in diameter; or with stem girdling roots are unacceptable.
2. Collected Stock: Plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery shall not be acceptable.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to the Landscape Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant. Labels shall remain on all plants through the duration of substantial completion and final punch lists for verification of plants.

2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: 21-gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

A. Organic Mulch: Soil pep.

2.4 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.5 ROOT BARRIER

A. As indicated on Drawings.

PART 3 - EXECUTION

3.1 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329115 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Place blended planting soil over exposed subgrade.

C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.2 EXCAVATION FOR TREES AND SHRUBS

3.3 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by the Landscape Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, and turf areas and existing plants from damage caused by planting operations.

B. Prior to planting, locate all underground utilities. Do not place trees or plants on or near utility lines. Notify Landscape Architect of any conflicts between tree or plant locations and utility lines.

C. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits approximately three times as wide as root ball diameter.
2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.

D. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil when blended with planting soil, unless excavated subsoil and/or topsoil has a high content of clay. Remove rocks and all other undesirable materials from excavated soil before blending with planting soil and backfilling.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. Backfill: Use excavated subsoil and topsoil blended with planting soil.
2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Balled and Potted and Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
4. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: Two tablets for each tree; one table for each shrub, ornamental grass, and flowering perennial.

6. Continue backfilling process. Water again after placing and tamping final layer of soil.

7. For trees within 4 feet of hardscape paving, install root barrier fabric per manufacturer's installation instructions and as shown on Drawings.

3.6 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees and shrubs only as directed by Landscape Architect.

C. Prune, thin, and shape trees and shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by the Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and

shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.7 ORNAMENTAL GRASSES AND FLOWERING PERENNIALS PLANTING

A. Set out and space plants, other than trees and shrubs, as indicated on Drawings.

B. Use planting soil blended with excavated soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.8 PLANTING AREA MULCHING

A. Following installation of trees and plants, rake planter areas smooth and to a finish grade level. Remove rocks and all other undesirable materials from planter areas.

B. Install drip irrigation tubing, distribution tubing, and tubing stakes for each tree and plant.

C. Apply mineral mulch to all planter areas.

1. Mineral Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of tree trunks or plant stems.

3.9 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

D. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.10 MAINTENANCE SERVICE

A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period for Trees and Shrubs: 12 months from date of Substantial Completion.
2. Maintenance Period Other Plants: 12 months from date of Substantial Completion.

3.11 FIELD QUALITY CONTROL

A Required Inspections:

1. Walk Through for Substantial Completion: Following complete installation of the entire planting and irrigation system, the contractor shall request a walk through for substantial completion with the Landscape Architect, at least seven (7) days prior to the anticipated walk through date. The walk through for substantial completion shall consist of a physical walk through, during which the contractor and the Landscape Architect will walk through each planter area. The Landscape Architect will prepare and provide a written punch list of plant materials and mulches needing adjustment, replacement and/or repair, and it will be the contractor's responsibility to completely remedy the punch list prior to requesting a final walk through or beginning the maintenance period. If the planter areas are deemed to be substantially complete at the end of this walk through, the contractor will begin the one-year maintenance period.
2. Final Walk Through: Following completion of all items on the punch list provided by the Landscape Architect at the walk through for substantial completion, the contractor shall request a final walk through with the Landscape Architect, at least seven (7) days prior to the anticipated walk through date. Once accepted, the Landscape Architect and the contractor will review only those items listed on the punch list provided at the walk through for substantial completion. In the event that the substantial completion punch list has not been fully completed, the final walk through will be canceled and the contractor shall be responsible for remedying all outstanding items on the punch list prior to making a second request for a final walk through. During the final walk through, only the items on the punch list for substantial completion will be reviewed, noting conformance or lack thereof.
3. Post Maintenance Walk Through: Following a successful final walk through, the contractor will be responsible for maintaining the plant material and the irrigation system for a period of 365 days. The contractor is responsible for including a fee for the 365-day maintenance period in their initial bid for services. In the event that the contractor fails to include such fee in their initial bid, the contractor will still be responsible for the 365-day maintenance period as stated herein at no additional cost to the Owner. Once the 365-day maintenance period has elapsed, the contractor shall request a post maintenance walk through with the Landscape Architect, at least seven (7) days prior to the anticipated walk through date. The post maintenance walk through will consist of a physical walk through to compare the pre-maintenance condition of each planting area to its present condition. Should any non-conformance with the pre-maintenance condition occur, the Landscape Architect will provide a punch list to the contractor for remedy, repair and/or replacement of plant materials and mulches. Such remedy, replacement and/or repair shall be successfully completed by the contractor at no additional cost to the Owner prior to being relieved of the maintenance period and/or final payment made to the contractor

by the Owner. Once the contractor has successfully remedied any outstanding items noted during the post maintenance walk through, the Landscape Architect will contact the Owner and recommend that the contractor be released of responsibility and final payment to the contractor be made.

END OF SECTION 32 9300

SECTION 1

MEASUREMENT AND PAYMENT DIVISION

General and supplemental general conditions. Applicable provisions of the GENERAL CONDITIONS and SUPPLEMENTAL GENERAL CONDITIONS apply to and are made a part of this Division.

Measurement and Payment: Measurement shall be made in the units or lump sums shown on the bid schedule. Payment shall be made at the unit price or lump sum price bid in the bid schedule for the items described below, which shall be payment in full for all costs of furnishing labor, tools, equipment, materials, testing, and etc., to complete the items of work as specified and as shown on the drawing(s).

LAYTON CITY ADAMS CANYON TRAILHEAD - PROJECT 22-1

ADAMS CANYON TRAILHEAD

CONSTRUCTION SURVEYING & STAKING… **(Base Bid Item 2)**

Measurement shall be lump sum of construction surveying and staking required to prepare the site for accurate construction and completion of the project.

Payment shall be at the unit price bid and shall include all costs and materials required to accomplish the surveying and staking.

TRAFFIC CONTROL / CONSTRUCTION FENCING… **(Base Bid Item 3)**

Measurement shall be lump sum of traffic control and construction fencing required to manage the safety of the site and surroundings during the duration of the construction project.

Payment shall be at the unit price bid and shall include all costs and materials required to accomplish the traffic control and construction fencing.

TESTING… **(Base Bid Item 4)**

Measurement shall be lump sum of testing required to ensure the concrete passes strength and resilience of built structures constructed.

Payment shall be at the unit price bid and shall include all costs and materials required to accomplish the testing.

EROSION CONTROL… **(Base Bid Item 5)**

Measurement shall be lump sum of erosion control required to prepare the site for the project.

Payment shall be at the unit price bid and shall include all costs and materials required to control erosion including the tasks of placing straw waddles near storm drains, and furnishing all labor, equipment, materials and tools needed to implement the erosion control.

DEMOLITION/SITE CLEARING & SITE GRADING… **(Base Bid Item 6)**

Measurement shall be per lump sum of site clearing and site grading required to prepare the site for rough grading.

Payment shall be at the unit price bid and shall include all costs and materials required to site grade in preparation for rough grading including the tasks of clearing, grubbing and removal; providing necessary subgrade preparation including shaping and compaction; restoring any damaged property items resulting from site grading including sod, fences, sprinkling systems, asphalt, sidewalk, landscaping, and associated property items; and removing and legally disposing all waste materials.

EARTHWORK & GRADING… **(Base Bid Item 7)**

Measurement shall be lump sum of rough grading required to prepare the site for road base and asphalt (or concrete).

Payment shall be at the unit price bid and shall include all costs and materials required to rough grade the site in preparation for installing road base and asphalt (or concrete) including the tasks of clearing, grubbing and removal; providing necessary subgrade preparation including shaping and compaction; restoring any damaged property items resulting from rough grading including sod, fences, sprinkling systems, asphalt, sidewalk, landscaping, and associated property items; and removing and legally disposing all waste materials.

FURNISH AND INSTALL 6" DEPTH ROADBASE…. **(Base Bid Item 8)**

Measurement shall be per ton of gravel roadbase installed on the project. The weight factor for gravel roadbase shall be assumed not to exceed 136 pounds per cubic foot. Copies of original weight tickets with summary sheet showing the job description are required for measurement verification. All tickets must identify the project name, project number and section, and intended use (street construction) of the roadbase material.

Payment shall be at the unit price bid. If the weight described in the measurement section above exceeds the assumed amount, the bid price will be adjusted using the following formula: (Quantity delivered*136/proctor weight*unit bid=payment amount). The bid price shall include all costs to furnish, place, shape, grade, compact, and test the gravel roadbase (6 inches below trails, sidewalks and curb & gutter); provide dust control and associated work items. Payment also includes the placement, shaping, grading, compaction and testing of the material at the curb & gutter, trail, and sidewalk locations.

FURNISH AND INSTALL 4" DEPTH CONCRETE…. **(Base Bid Item 8)**

Measurement shall be made per square feet of concrete. Public Works Inspector must verify measurement in the field or no compensation will be given.

Payment shall be at the unit price bid and shall include all costs and materials required to restore damaged property items resulting from construction including sod, fences, sprinkling systems, asphalt, sidewalk, landscaping, and associated property items; remove and legally dispose of all waste material; furnish and install the 4-inch thick (or 6-inch thick) concrete on the 6-inch thick roadbase (or 10" roadbase respectively) provide subgrade preparation including shaping and compaction; provide forming, concrete, finishing, expansion materials, and curing compound; provide watchmen to protect the concrete from vandalism; restore damaged property items resulting from construction including sod, fences, sprinkling systems, asphalt, sidewalk, landscaping, and associated property items; remove and

legally dispose of all waste material. Payment also includes costs to form and construct the thickened sidewalk for the support in all areas requiring the supported sidewalk as indicated on the drawings.

RESTROOM… **(Base Bid Item 9)**

Measurement shall be lump sum to prepare the site for the restroom as shown on plans.

Payment shall be made at the unit price bid and shall include all costs, materials, and labor to prepare the site for the restroom; over-excavation; shape, compact, prepare and place the material as indicated on the drawings.

KIOSK… **(Base Bid Item 10)**

Measurement shall be lump sum to install the kiosk as shown on plans.

Payment shall be made at the unit price bid and shall include all costs, materials, and labor to furnish and install the material; over-excavation; shape, compact, prepare and place the material as indicated on the drawings.

DRINKING FOUNTAIN… **(Base Bid Item 11-12)**

Measurement shall be lump sum to prepare the site for the drinking fountain as shown on plans.

Payment shall be made at the unit price bid and shall include all costs, materials, and labor to prepare the site for the drinking fountain; over-excavation; shape, compact, prepare and place the material as indicated on the drawings.

BENCHES… **(Base Bid Item 13)**

Measurement shall be per each bench to furnish and install the benches as shown on plans.

Payment shall be made at the unit price bid and shall include all costs, materials, and labor to furnish and install the material; over-excavation; shape, compact, prepare and place the material as indicated on the drawings.

BIKE RACK… **(Base Bid Item 14)**

Measurement shall be lump sum to install the bike rack and bike repair stand as shown on plans.

Payment shall be made at the unit price bid and shall include all costs, materials, and labor to furnish and install the material; over-excavation; shape, compact, prepare and place the material as indicated on the drawings.

FURNISH AND INSTALL LANDSCAPE IRRIGATION… **(Base Bid Items 15)**

Measurement shall be lump sum to furnish and install the landscape irrigation as specified in the drawings.

Payment shall be at the unit price bid and shall include all materials, costs, and labor to furnish and install all landscape irrigation specified in the drawings. Payment includes furnishing and installing all pipes, fittings, valves, backflow preventers, automatic controllers, pedestals, sprinkler heads, plastic nozzles, drip tubings, filters, valve boxes, and/or all other associated items to install the sprinkling system. Payment also includes flushing the main lines before installing automatic control valves, laterals before installing sprinklers, and supply lines before installing backflow preventers or other regulating devices. Payment includes all materials and costs associated with connecting the sprinkler system to the electrical system (or battery controller).

Payment also includes restoration of damaged property items resulting from construction including fences, sprinkling systems, asphalt, sidewalk, landscaping, and associated property items; and removal and legal disposal of all waste material.

FURNISH AND INSTALL LANDSCAPING… **(Base Bid Items 16-17)**

Measurement shall be per lump sum to furnish and install landscaping as specified in the drawings.

Payment shall be at the lump sum price bid and shall include all materials, costs, and labor to furnish and install all landscaping specified in the drawings. Payment includes furnishing and installing all pipes, fittings, valves, backflow preventers, automatic controllers, pedestals, sprinkler heads, plastic nozzles, drip tubings, filters, valve boxes, and/or all other associated items to install the sprinkling system. Payment also includes flushing the main lines before installing automatic control valves, laterals before installing sprinklers, and supply lines before installing backflow preventers or other regulating devices. Payment includes all materials and costs associated with connecting the sprinkler system to the electrical system.

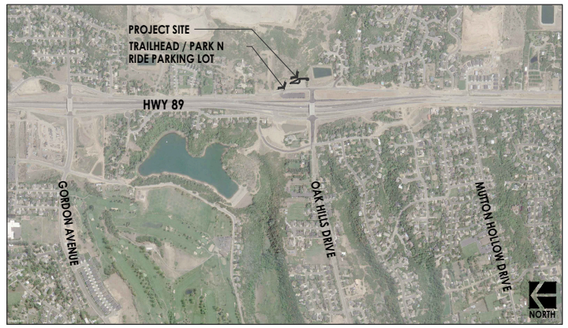
Payment shall also include all costs, materials and labor to furnish and install all sod, and/or seeds, as specified in the drawings. Payment includes restoration of damaged property items resulting from construction including fences, sprinkling systems, asphalt, sidewalk, landscaping, and associated property items; and removal and legal disposal of all waste material.

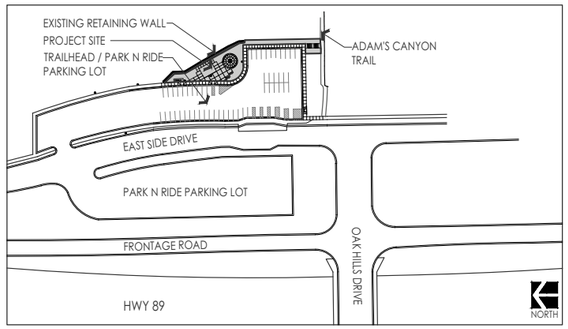
1. ENUMERATION OF DRAWINGS

The drawings for this project are as follows:

NAME	DRAWING NUMBER
Adams Canyon Trailhead Improvements	CONSTRUCTION BID SET
CXT Precast Products: Arapahoe	PRELIMINARY PLAN SET

STANDARD DRAWINGS





LOCATION MAPS

SHEET INDEX

LAYTON CITY

ADAM'S CANYON TRAILHEAD IMPROVEMENTS

450 NORTH EASTSIDE DRIVE LAYTON UTAH

Think Architecture

Architecture
Interior Design
Landscape Architecture
Land Planning
Construction Management

7927 High Point Parkway, Suite 300
Salt Lake City, UT 84094
ph. 801.269.0055
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LICENSED LANDSCAPE ARCHITECT
CURTIS R TANNER
NO. 166779
STATE OF UTAH

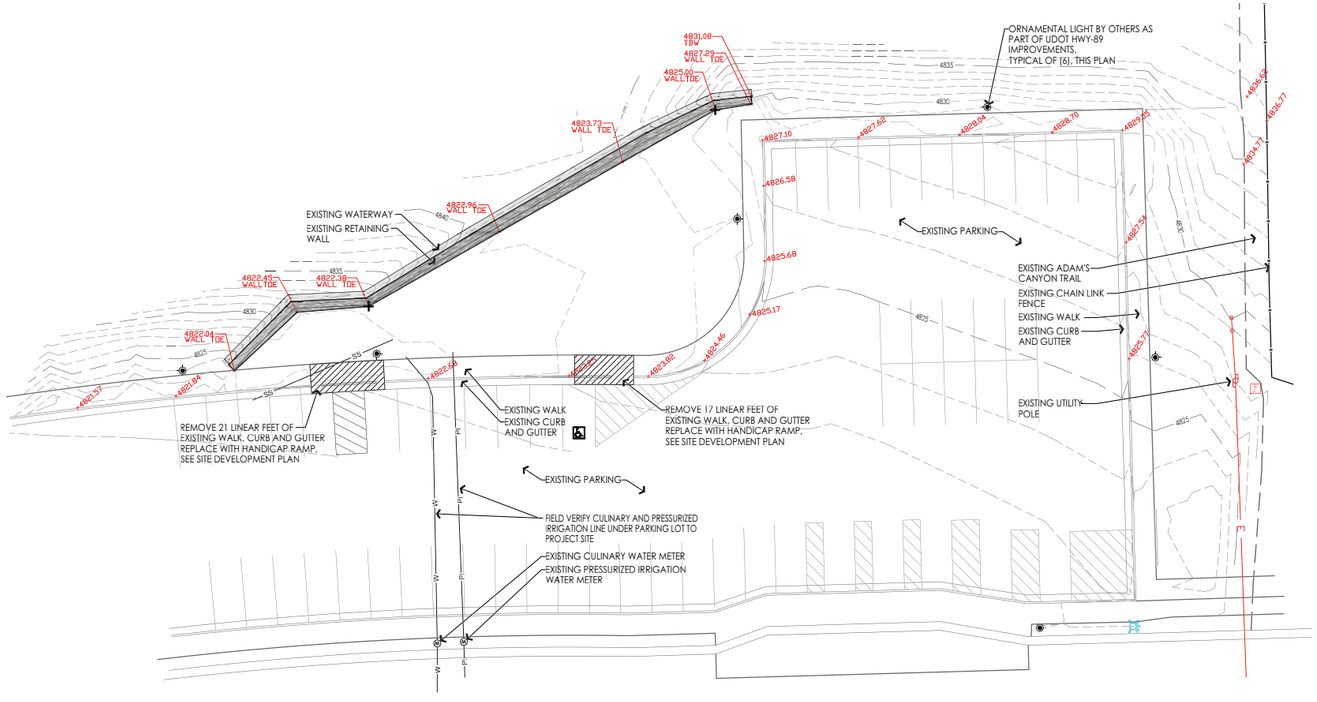
02 MAY 2022

ADAM'S CANYON TRAILHEAD IMPROVEMENTS
450 NORTH EASTSIDE DRIVE LAYTON UTAH

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

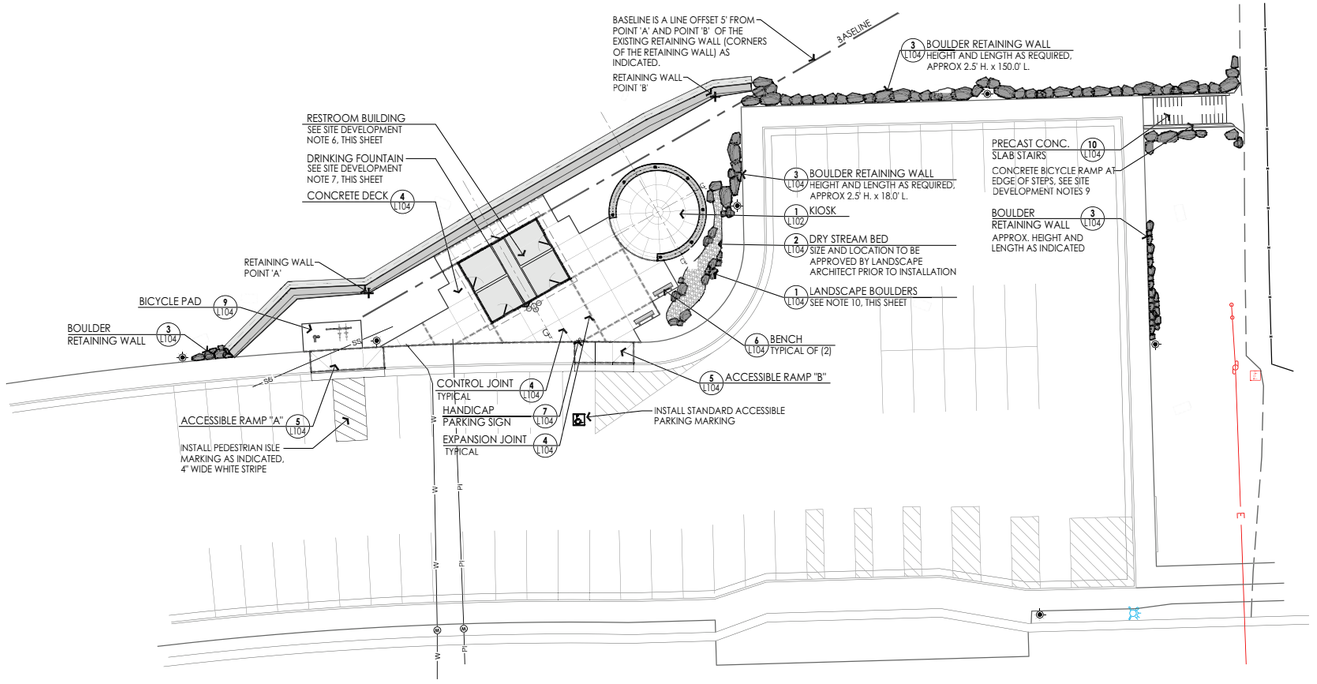
02 MAY 2022 - PERMIT AND BID SET

SHEET TITLE:
SITE DEVELOPMENT PLAN
SHEET NUMBER:
L001
LANDSCAPE



EXISTING CONDITIONS / DEMOLITION PLAN

0 10 20 40 NORTH



SITE DEVELOPMENT PLAN

0 10 20 40 NORTH

EXISTING CONDITIONS NOTES

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS. CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT IN WRITING IF EXISTING FIELD CONDITIONS VARY FROM WHAT IS INDICATED ON PLAN.

EXISTING CONDITIONS LEGEND

- 4828.04 — EXISTING SPOT ELEVATION
- EXISTING MINOR CONTOUR
- 4825 — EXISTING MAJOR CONTOUR
- E — EXISTING ELECTRICAL
- PI — EXISTING PRESSURIZED IRRIGATION
- W — EXISTING CULINARY WATER
- SS — EXISTING SANITARY SEWER

SITE DEVELOPMENT NOTES

1. ALL LINES OR POINTS ARE PERPENDICULAR OR PARALLEL TO LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE NOTED; WRITTEN DIMENSIONS SHALL PREVAIL.
2. THE CONTRACTOR SHALL VERIFY ALL LAYOUT, DIMENSIONS, GRADES, AND INVERTS PRIOR TO CONSTRUCTION; REPORT ANY AND ALL DISCREPANCIES TO THE LANDSCAPE ARCHITECT. ALL DISCREPANCIES SHALL BE RESOLVED IN WRITING PRIOR TO BEGINNING WORK.
3. ALL AREAS DISTURBED FROM CONSTRUCTION ACTIVITY TO BE RAKED, SMOOTHED, FERTILIZED AND SEEDED UNLESS OTHERWISE NOTED.
4. ALL NEW WALKS AND SURFACES TO MEET EXISTING WALKS AND SURFACES WITH SMOOTH, CONTINUOUS LINE AND GRADE.
5. THE CONTRACTOR SHALL NOT INSTALL CONCRETE DURING ADVERSE WEATHER CONDITIONS (RAIN, SLEET, ETC.) UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT.
6. PRE-MANUFACTURED RESTROOM TO BE DIRECT-PURCHASED BY OWNER. MANUFACTURED BY CXT PRECAST PRODUCTS, HILLSBORO, TX., MODEL: ARAPAHO.
   - 6.1. CONTRACTOR TO COORDINATE DELIVERY AND INSTALLATION AND IS RESPONSIBLE FOR SUB-GRADE PREPARATION UNDER PREFABRICATED BUILDING, COORDINATION OF BUILDING PLACEMENT (CRANE PLACEMENT BY VENDOR), STUBBING OF ALL UTILITIES 12" ABOVE GRADE. INSTALLATION, ASSEMBLY AND CONNECTION OF ALL RESTROOM UTILITIES.
   - 6.2. CONTRACTOR TO OBTAIN STAMPED STRUCTURAL ENGINEERING PLANS FROM MANUFACTURER (VIA LAYTON CITY/OWNER) TO VERIFY FINAL DESIGN, AND DESIGN OF SUB-GRADE, AND ACCURATE PLACEMENTS OF ALL UTILITIES.
   - 6.3. CONTRACTOR TO FILL BLOCK-OUTS IN CONCRETE FLOOR WITH CONCRETE AFTER INSTALLATION AND CONNECTION OF ALL UTILITIES.
   - 6.4. PRIOR TO PLACEMENT OF BUILDING CONTRACTOR TO PROVIDE A PROPERLY PREPARED SUB-BASE. SUB-BASE SHALL BE A MINIMUM OF 6" THICK AND CONSIST OF 3/4" MINUS CRUSHED ROCK (ROAD BASE MATERIAL) COMPACTED TO 95% OP OPTIMUM DENSITY IN ACCORDANCE WITH ASTM D 1557. FINISHED SURFACE OF SUB-BASE SHALL BE FLAT AND LEVEL, WITH A MINIMUM DEVIATION OF - 1/2", +0 FROM A TRUE HORIZONTAL PLANE. REFER TO BUILDING HANDLING SHEET FOR SUB-BASE REQUIREMENTS DURING BUILDING PLACEMENT. PREPARED SUB-BASE NOT BY CXT.
   - 6.5. CONCRETE DECK AT ALL RESTROOM BUILDING DOORS TO BE FLUSH WITH FINISH FLOOR.
7. DRINKING FOUNTAIN/BOTTLE FILLER/DOG WATERING STATION TO BE MANUFACTURED BY: MDF, MOST DEPENDABLE FOUNTAINS, INC., ARLINGTON, TN. PHONE: 901.867.009. www.mostdependable.com. MODEL: 1014S SMSSFA WITH OPTIONAL PET FOUNTAIN, COLOR: CHROME (STAINLESS STEEL). BACK OF FOUNTAIN TO BE OFFSET 10 INCHES FROM EXTERIOR WALL OF RESTROOM BUILDING AND LOCATED NORTH/SOUTH AT CENTERLINE OF BUILDING. INSTALL FOUNTAIN PER MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE WATER AND SEWER AS REQUIRED.
8. INSTALLATION OF ALL SITE IMPROVEMENTS TO MEET LOCAL CODES AND STANDARDS.
9. CONSTRUCT A 12' WIDE CONCRETE RAMP TO ACCOMMODATE BICYCLES AT WEST SIDE OF STAIRS. SEE DETAIL **10/L104**.
10. QUANTITY AND LOCATION OF LANDSCAPE BOULDERS AS SHOWN ON PLAN (APPROXIMATE). SIZE OF LANDSCAPE BOULDERS TO RANGE FROM 6' LENGTH MAX. TO 2.5' LENGTH MIN. LANDSCAPE BOULDER PLACEMENT TO BE APPROVED BY LANDSCAPE ARCHITECT.

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LICENSED LANDSCAPE ARCHITECT
CURTIS R TANNER
NO. 166779
STATE OF UTAH

02 MAY 2022

ADAM'S CANYON TRAILHEAD IMPROVEMENTS
450 NORTH EASTSIDE DRIVE LAYTON UTAH

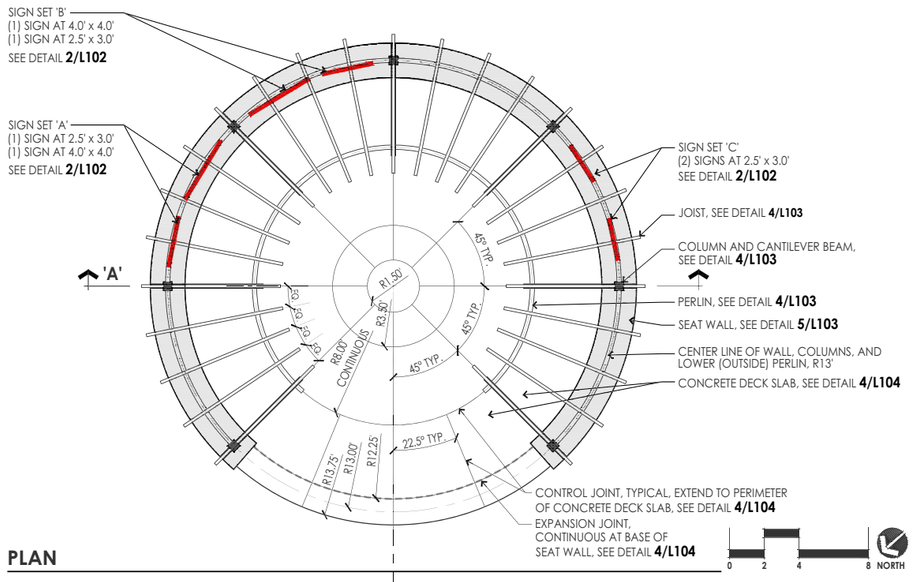
PROJECT NO. 21145
DATE: 02 MAY 2022

REVISIONS:

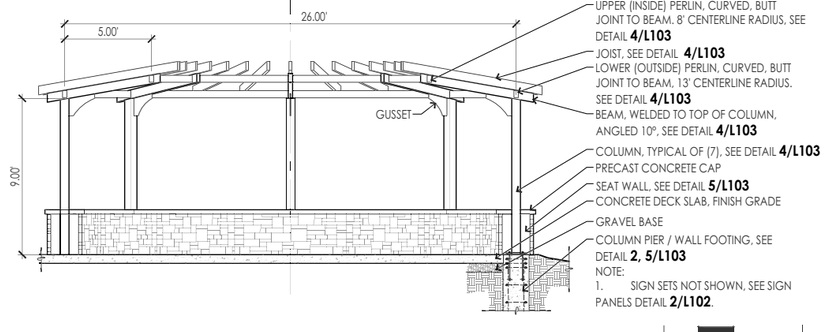
02 MAY 2022 - PERMIT AND BID SET

SHEET TITLE:
EXIST. COND. / SITE DEVELOPMENT PLAN

SHEET NUMBER:
L101
LANDSCAPE



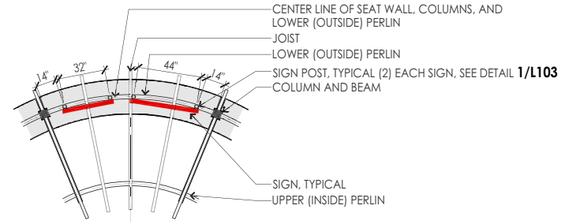
PLAN



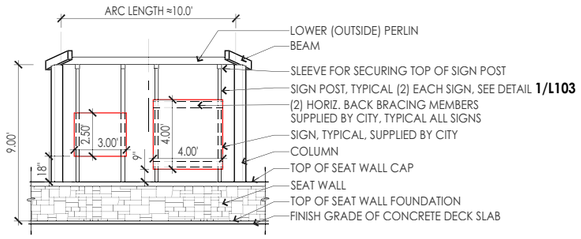
SECTION

NOTES:
1. FINISH OF ALL TUBING TO BE POWDER COATED, BLACK.
2. ALL ASSEMBLY HARDWARE TO BE GALVANIZED, PRIMED AND PAINTED BLACK, UNLESS OTHERWISE INDICATED, SHEEN OF PAINT TO MATCH POWDER COATING.
3. ALL EXPOSED ENDS OF TUBES TO BE CLOSED WITH END CAPS WELDED, CONTINUOUS.
4. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF KIOSK.

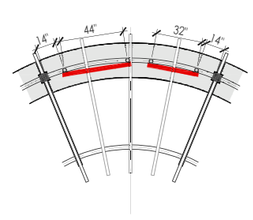
KIOSK 1



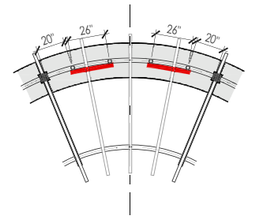
SIGN SET 'A' - PLAN



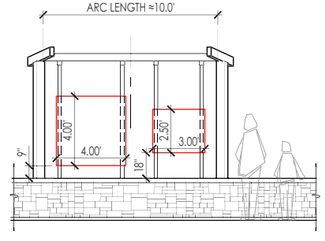
SIGN SET 'A' - ELEVATION



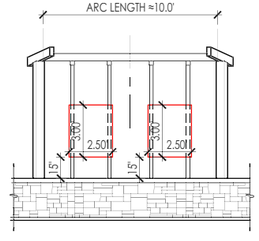
SIGN SET 'B' - PLAN



SIGN SET 'C' - PLAN



SIGN SET 'B' - ELEVATION



SIGN SET 'C' - ELEVATION

NOTES:
1. NOTES AND LABLES OF SIGN SET 'A' PLAN AND ELEVATION APPLY TO SIGN SETS 'B' AND 'C'.
2. ALL ASSEMBLY HARDWARE TO BE GALVANIZED, PRIMED AND PAINTED BLACK, UNLESS OTHERWISE INDICATED, SHEEN OF PAINT TO MATCH POWER COATING.
3. SIGNS TO BE PROVIDED BY LAYTON CITY.
4. SIGNS TO BE SECURED TO SIGN POSTS USING (4) Ø 1/4" STAINLESS STEEL, TAMPER RESISTANT PAN HEAD BOLTS, NUTS AND WASHERS AT EACH CORNER OF SIGN. DRILL HOLES THROUGH SIGN POSTS FOR MOUNTING BOLTS. PRIME AND PAINT EXPOSED METAL
5. CONTRACTOR TO COORDINATE SIGN INSTALLATION WITH CITY.
6. SIGN POSTS TO BE POWDER COATED BLACK.

SIGN PANELS 2

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STATE OF UTAH

02 MAY 2022

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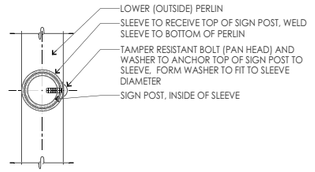
450 NORTH EASTSIDE DRIVE LAYTON UTAH

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

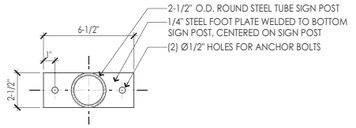
02 MAY 2022 - PERMIT AND BID SET

SHEET TITLE:
SITE DEVELOPMENT DETAILS

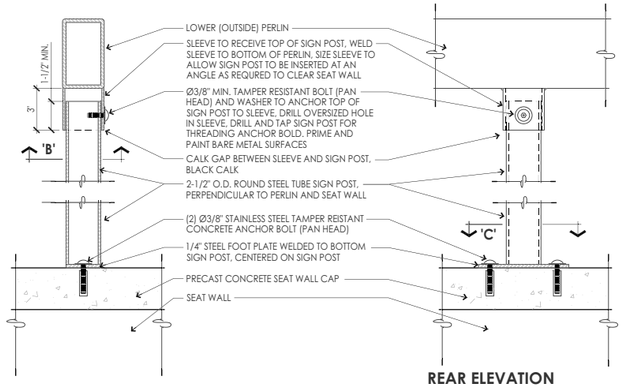
SHEET NUMBER:
L102
LANDSCAPE



SECTION 'B'



SECTION 'C'

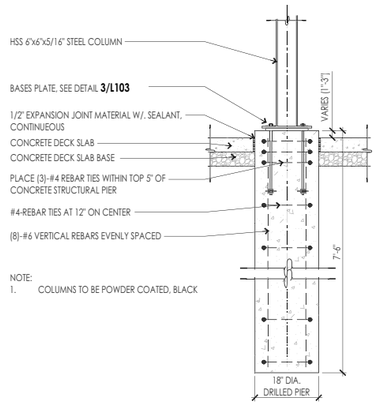


SECTION AT SIGN POST

REAR ELEVATION OF SIGN POST

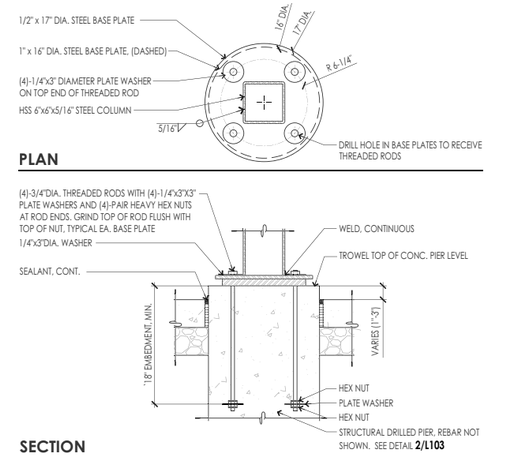
NOTE:
1. ALL ASSEMBLY HARDWARE TO BE GALVANIZED, PRIMED AND PAINTED BLACK, UNLESS OTHERWISE INDICATED, SHEEN OF PAINT TO MATCH POWER COATING.
2. ANCHOR BOLT AT TOP OF SIGN POST TO BE AT REAR OF KIOSK, OUT OF VIEW.

SIGN POSTS (1)



NOTE:
1. COLUMNS TO BE POWDER COATED, BLACK

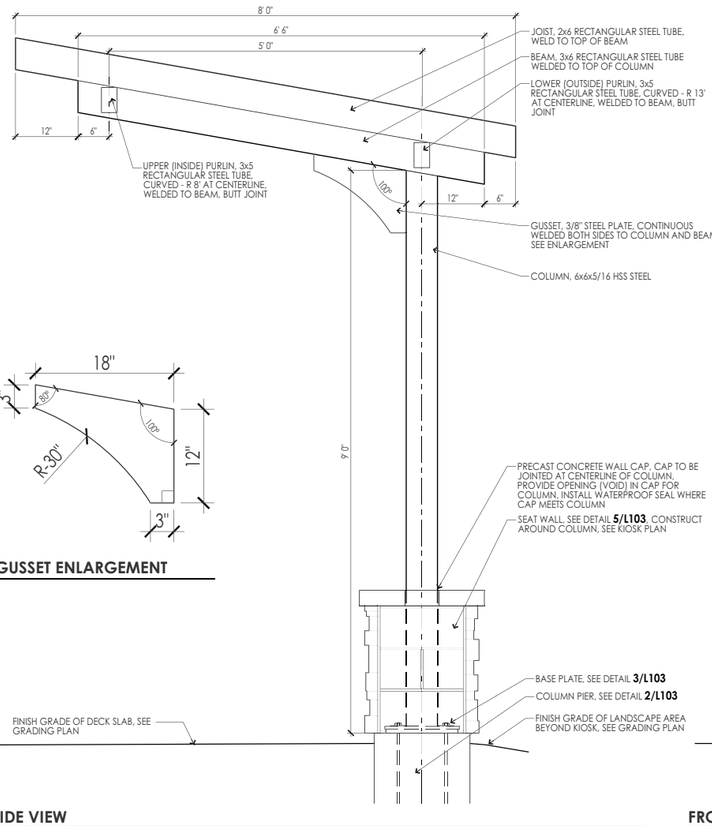
COLUMN PIER (2)



PLAN

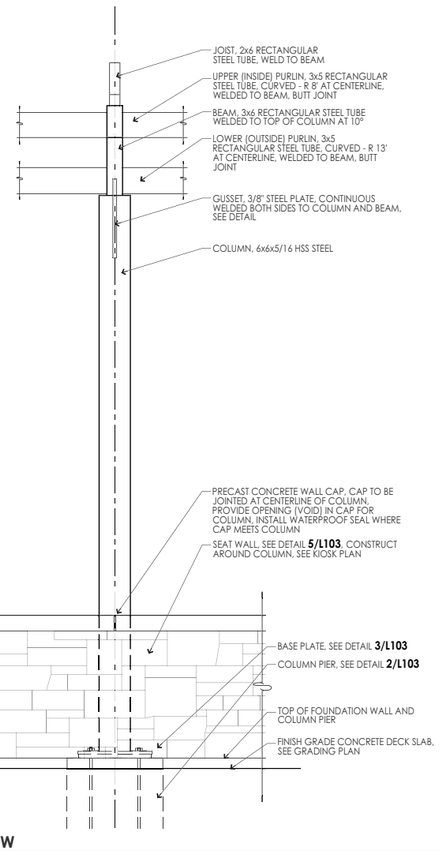
SECTION

BASE PLATE (3)



SIDE VIEW

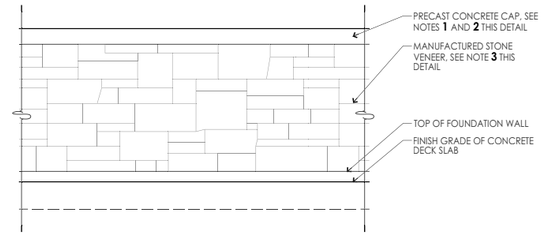
GUSSET ENLARGEMENT



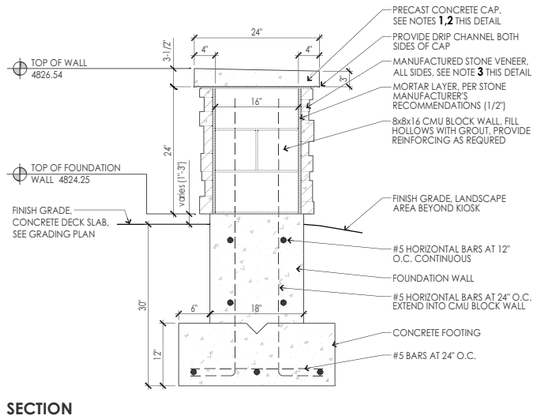
FRONT VIEW

NOTES:
1. ALL STEEL TUBE MEMBERS TO HAVE WELDED STEEL CAPS, CONTINUOUS WELD.
2. FINISH OF ALL STEEL MEMEBER TO HAVE POWDER COAT FINISH, COLOR BLACK.
3. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR APPROVAL.

KIOSK STRUCTURE (4)



ELEVATION



SECTION

NOTES:
1. PRECAST CONCRETE CAP TO BE COLORED WITH INTEGRAL CONCRETE COLOR. COLOR TO BE MEDIUM GRAY TO MATCH GRAY OF MANUFACTURED STONE VENEER. FINISH WITH LIGHT BROOM FINISH.
2. SECURE CAP TO MASONRY WALL WITH HEAVY DUTY CONSTRUCTION ADHESIVE. ALLLOW FOR EXPANSION OF ADHESIVE WHEN PLACING CAP. NO ADHESIVE TO BE VISABLE.
3. MANUFACTURED STONE VENEER TO BE 'UINTAH LEDGESTONE, ROCKY CLIFF', MANUFACTURED BY HARRISTONE, OGDEN, UT. PHONE: 888.878.6631. www.harristone.com. THICKNESS OF MANUFACTURED STONE VENEER VARIES BETWEEN 1-1/2" TO 2-1/2".

SEAT WALL (5)

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LICENSED LANDSCAPE ARCHITECT
CURTIS R TANNER
NO. 166779
STATE OF UTAH

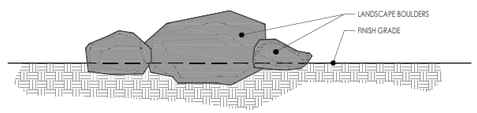
02 MAY 2022

ADAM'S CANYON TRAILHEAD IMPROVEMENTS
450 NORTH EASTSIDE DRIVE LAYTON UTAH

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

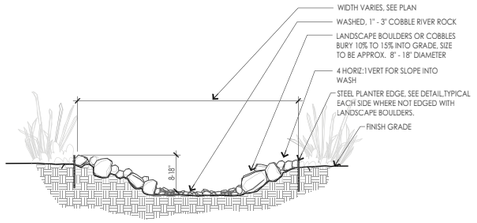
02 MAY 2022 - PERMIT AND BID SET

SHEET TITLE:
SITE DEVELOPMENT DETAILS
SHEET NUMBER:
L103
LANDSCAPE

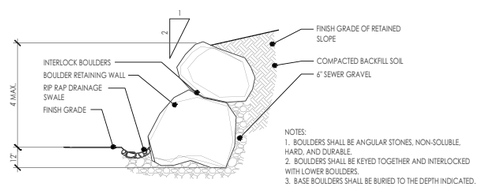


NOTE:
1. SEE SITE PLAN FOR SIZE AND QUANTITY OF BOULDERS.
2. BOULDER PLACEMENT TO BE APPROVED BY LANDSCAPE ARCHITECT ON SITE.
3. 25-30% OF BOULDERS TO BE BURIED BELOW FINISH GRADE.

LANDSCAPE BOULDERS 1

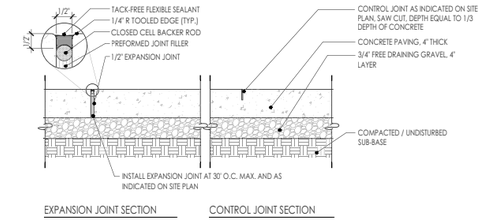


DRY / IMPLIED STREAM BED SECTION 2



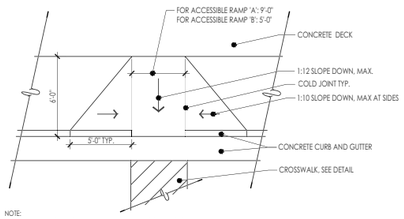
NOTES:
1. BOULDERS SHALL BE ANGULAR STONES, NON-SOLUBLE, HARD, AND DURABLE.
2. BOULDERS SHALL BE KEYED TOGETHER AND INTERLOCKED WITH LOWER BOULDERS.
3. BASE BOULDERS SHALL BE BURIED TO THE DEPTH INDICATED.
4. SUB-GRADE SHALL BE THOROUGHLY COMPACTED BEFORE PLACEMENT OF BOULDERS.
5. BOULDER SIZE TO BE 2'-0" TO 3'-0" DIA.
6. LARGER BOULDERS TO BE USED AT BASE. SMALLER BOULDERS TO BE USED ON UPPER COURSES.

BOULDER RETAINING WALL 3



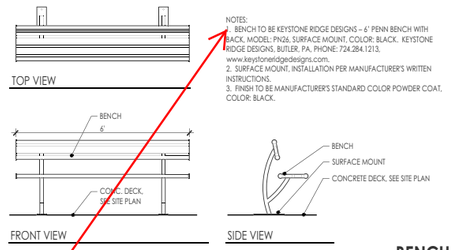
NOTES:
1. CONTROL JOINTS SHALL OCCUR AT 4' O.C. MAX.
2. CONCRETE SHALL BE 6-1/2 BAG MIX AT 4000 PSI, OR AS OTHERWISE INDICATED.
3. JOINTS TO HAVE STRAIGHT, CONTINUOUS, PARALLEL/PERPENDICULAR LINES.

CONCRETE DECK 4



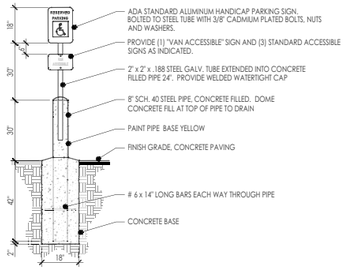
NOTE:
1. PROVIDE COLD JOINTS AND OR 3/4" KEYWAYS AT ALL BREAKS IN POURS.
2. REPLACE CURB AND GUTTER WITH CURB AND GUTTER MATCHING EXISTING, PROVIDING SLOPED CURB TO ACCOMMODATE RAMP.

ACCESSIBLE RAMP 5

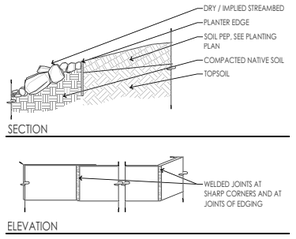


NOTES:
1. BENCH TO BE KEYSTONE RIDGE DESIGNS – 6' PENN BENCH WITH BACK, MODEL: PN26, SURFACE MOUNT, COLOR: BLACK. KEYSTONE RIDGE DESIGNS, BUTLER, PA, PHONE: 724.284.1213, www.keystoneridgedesigns.com.
2. SURFACE MOUNT, INSTALLATION PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. FINISH TO BE MANUFACTURER'S STANDARD COLOR POWDER COAT, COLOR: BLACK.

BENCH 6

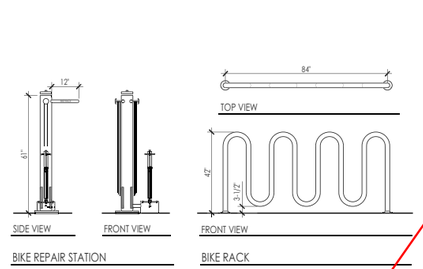


ADA ACCESSIBLE PARKING SIGN 7



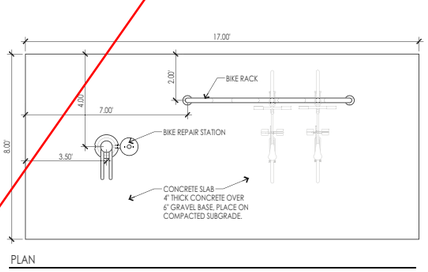
NOTES:
1. PLANTER EDGE TO BE 3/16" x 6" STEEL FLAT BAR.
2. ALL JOINTS ALONG RUNS OF EDGING TO BE WELDED TOGETHER W
3. SHARP CORNER JOINTS TO BE WELDED.
3. INSTALL PLANTER EDGE WITH SMOOTH EVEN LINE AND GRADE.
4. LOCATION OF PLANTER EDGE TO BE APPROVED BY LANDSCAPE ARCHITECT ON SITE PRIOR TO PLACEMENT.
5. WHERE EDGE MEETS WALKS, CURBS, PAVEMENT, ETC. TOP OF EDGE TO BE 1/2" BELOW TOP OF WALK, CURB, PAVEMENT, ETC.

STEEL PLANTER EDGE 8



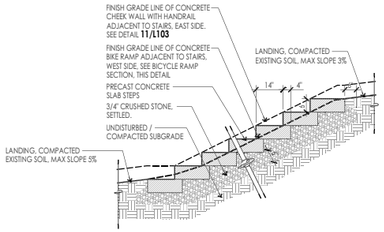
BIKE REPAIR STATION

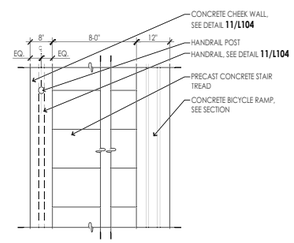
BIKE RACK

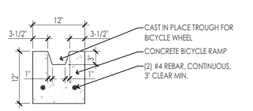


NOTES:
1. BIKE RACK TO BE KEYSTONE RIDGE DESIGNS – SONANCE 7 LOOP RACK, MODEL: SN07-9, SURFACE MOUNT, COLOR: SPARKLE SILVER KEYSTONE RIDGE DESIGNS, BUTLER, PA, PHONE: 724.284.1213, www.keystoneridgedesigns.com.
2. BIKE REPAIR STATION TO BE MDF, MOST DEPENDABLE FOUNTAINS, INC. – BIKE RACK AND AIR PUMP, MODEL: 185 SM, SURFACE MOUNT, COLOR: TEXTURED CHROME, MDF, ARLINGTON, TN, PHONE: 901.867.0039, www.mostdependable.com
3. SURFACE MOUNT AND INSTALLATION AS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

BICYCLE PAD 9

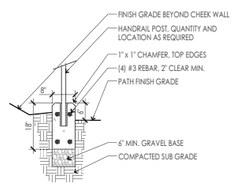


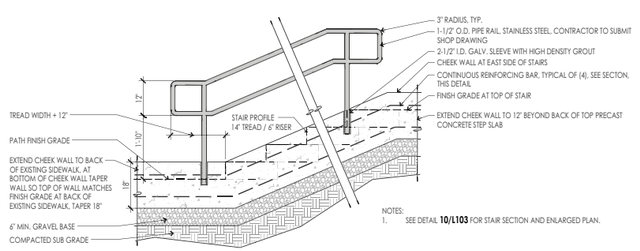




NOTES:
1. PRECAST CONCRETE STONE SLABS FOR STEPS TO BE 18" x 4' x 6". CONTRACTOR TO SUPPLY QUANTITY OF SLABS FOR FULL SET OF STAIRS.
2. PRECAST CONCRETE SLABS TO BE SET FIRMLY IN PLACE WITH NO MOVEMENT.
4. PRECAST CONCRETE SLABS TO BE BELGARD "LANDINGS", COLOR TO BE: ASPEN, AVAILABLE THROUGH SPRINKLER SUPPLY, LAYTON, UT. PHONE: 801.614.0600. www.sprinklersupplyco.com.
4. JOINTS BETWEEN STEP SLABS TO BE 1/8" AND FILLED WITH GATOR DUST, POLYMETRIC SAND, COLOR TO MATCH SLAB. PROVIDE COLOR SAMPLES FOR APPROVAL. POLYMETRIC SAND TO BE FINISHED 1/8" BELOW SLAB SURFACE.
5. STEP SLABS TO BE PLACED TO PROVIDE POSITIVE DRAINAGE TO FRONT OF STEP.
6. STAGGER LATERAL JOINTS BETWEEN TREADS.

PRECAST CONCRETE SLAB STAIRS 10





NOTES:
1. SEE DETAIL **10/L103** FOR STAIR SECTION AND ENLARGED PLAN.

CHEEK WALL AND HANDRAIL AT STAIR 11

Benches to also include a plaque. Include with order request to Keystone Ridge Designs the following:

"7x3 cast bronze plaque w/ plaque tray"

Model: PN26, Surface Mount, Color: Black, with 7x3 cast bronze plaque with plaque tray.

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LICENSED LANDSCAPE ARCHITECT
CURTIS R TANNER
NO. 166779
STATE OF UTAH

02 MAY 2022

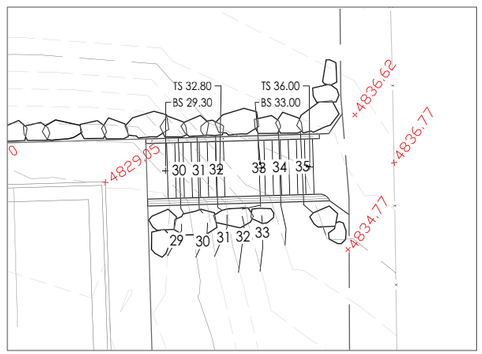
ADAM'S CANYON TRAILHEAD IMPROVEMENTS
450 NORTH EASTSIDE DRIVE LAYTON UTAH

02 MAY 2022 - PERMIT AND BID SET

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

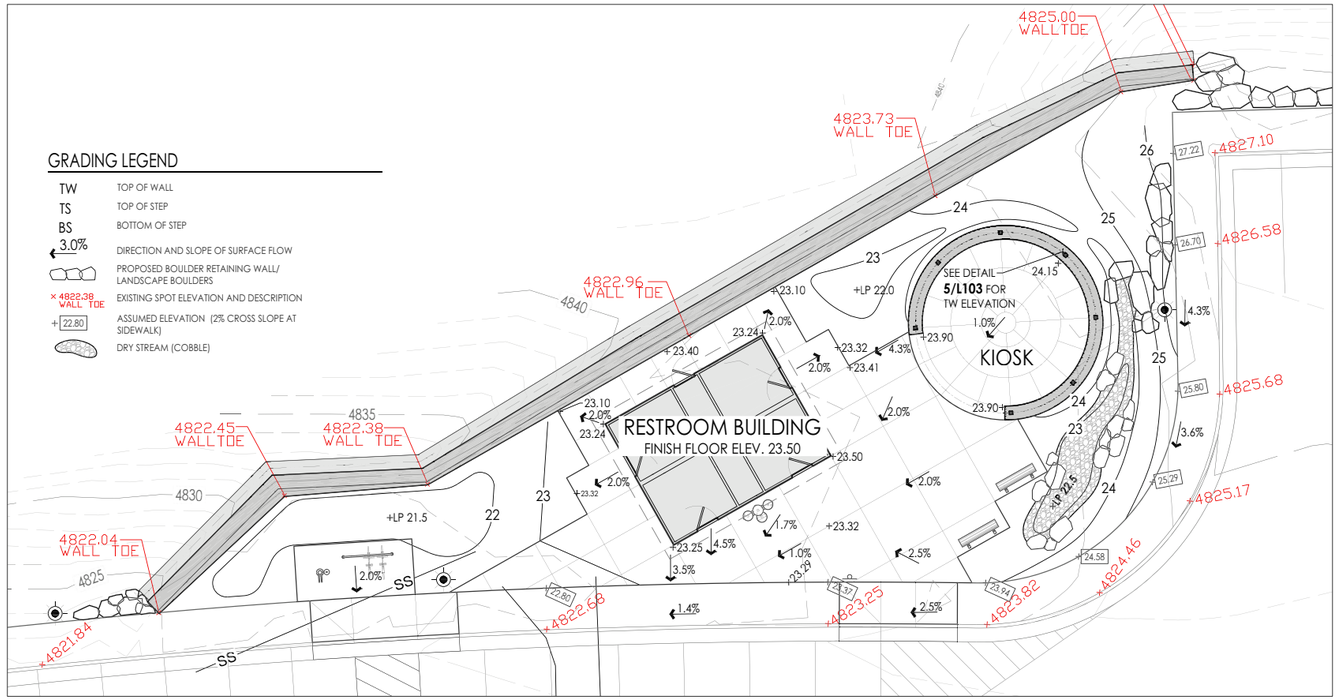
SHEET TITLE:
SITE DEVELOPMENT DETAILS

SHEET NUMBER:
L104
LANDSCAPE



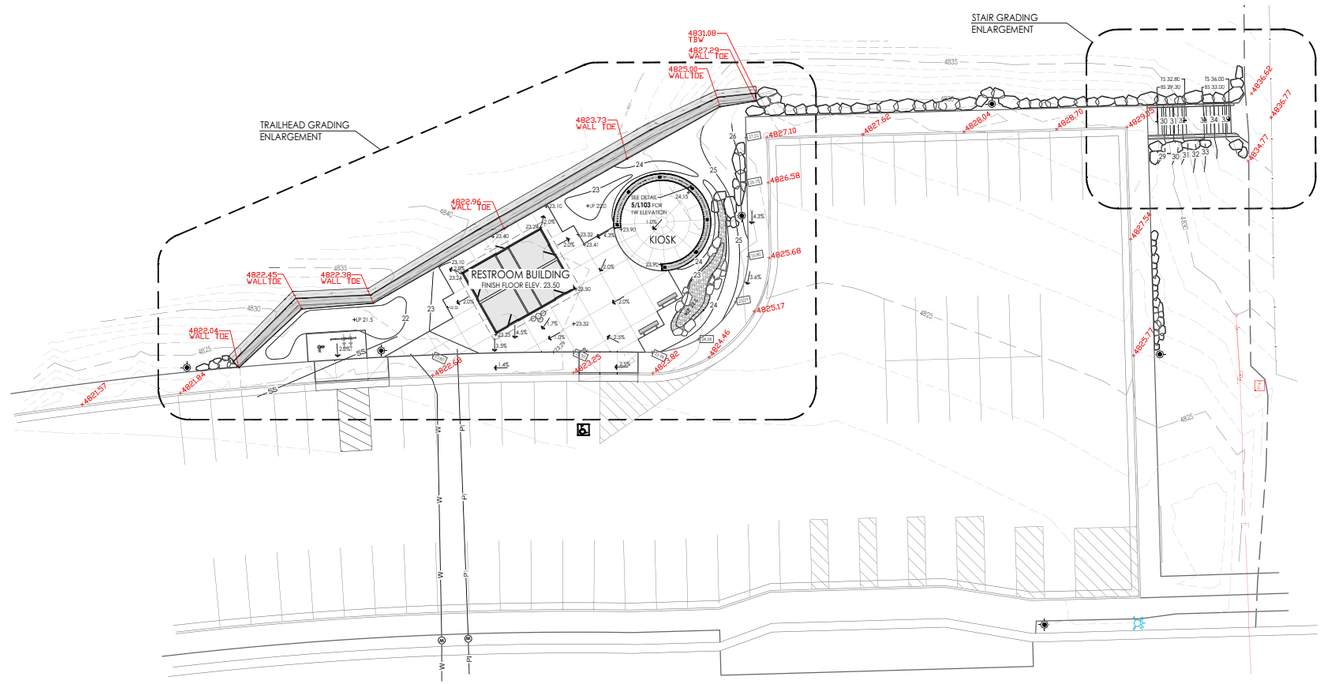
STAIR GRADING ENLARGEMENT

0 5 10 20 NORTH



TRAILHEAD GRADING ENLARGEMENT

0 5 10 20 NORTH



GRADING LEGEND

TW	TOP OF WALL
TS	TOP OF STEP
BS	BOTTOM OF STEP
3.0%	DIRECTION AND SLOPE OF SURFACE FLOW
	PROPOSED BOULDER RETAINING WALL/ LANDSCAPE BOULDERS
× 4822.38 WALL TOE	EXISTING SPOT ELEVATION AND DESCRIPTION
+ 22.80	ASSUMED ELEVATION (2% CROSS SLOPE AT SIDEWALK)
	DRY STREAM (COBBLE)

GRADING NOTES

1. ASSUME 2% CROSS SLOPE TO CURB AT UDOT SIDEWALK AT PARKING LOT PERIMETER ADJACENT TO PROJECT SITE.
2. CONCRETE DECK ELEVATION TO MATCH FINISH FLOOR ELEVATION AT EACH DOORWAY OF THE RESTROOM BUILDING.
3. SEE SITE PLAN FOR HEIGHTS OF BOULDER RETAINING WALLS.

OVERALL GRADING PLAN

0 10 20 40 NORTH

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02 MAY 2022

ADAM'S CANYON TRAILHEAD IMPROVEMENTS

450 NORTH EASTSIDE DRIVE LAYTON UTAH

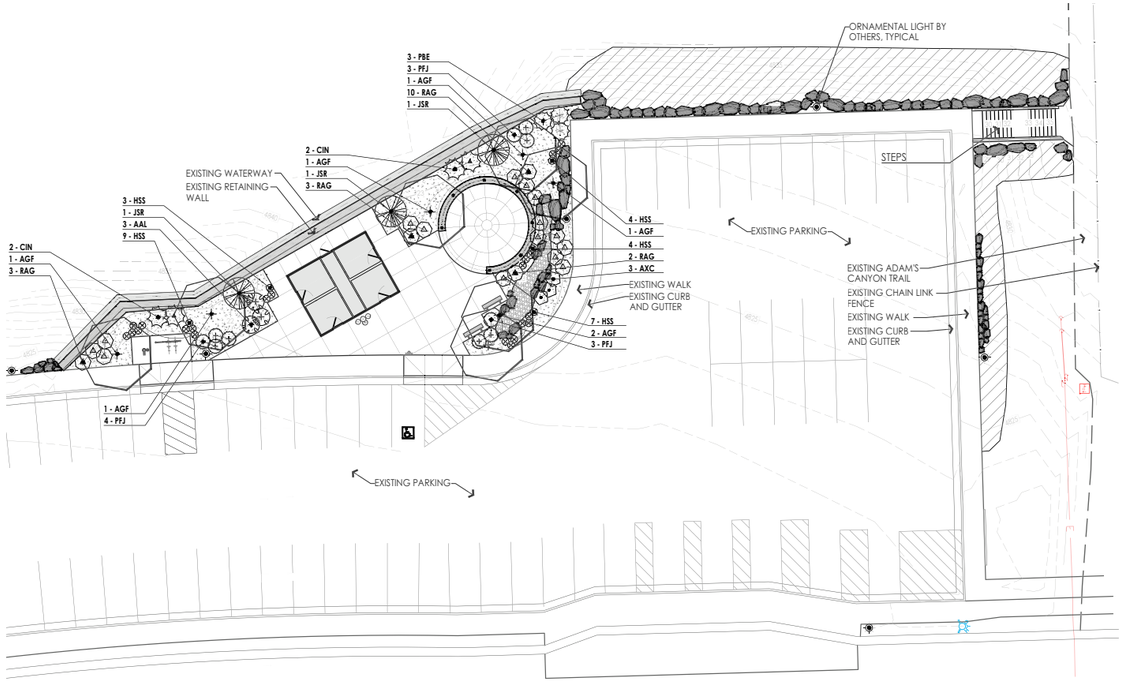
PROJECT NO. 21145
DATE: 02 MAY 2022

REVISIONS:

02 MAY 2022 - PERMIT AND BID SET

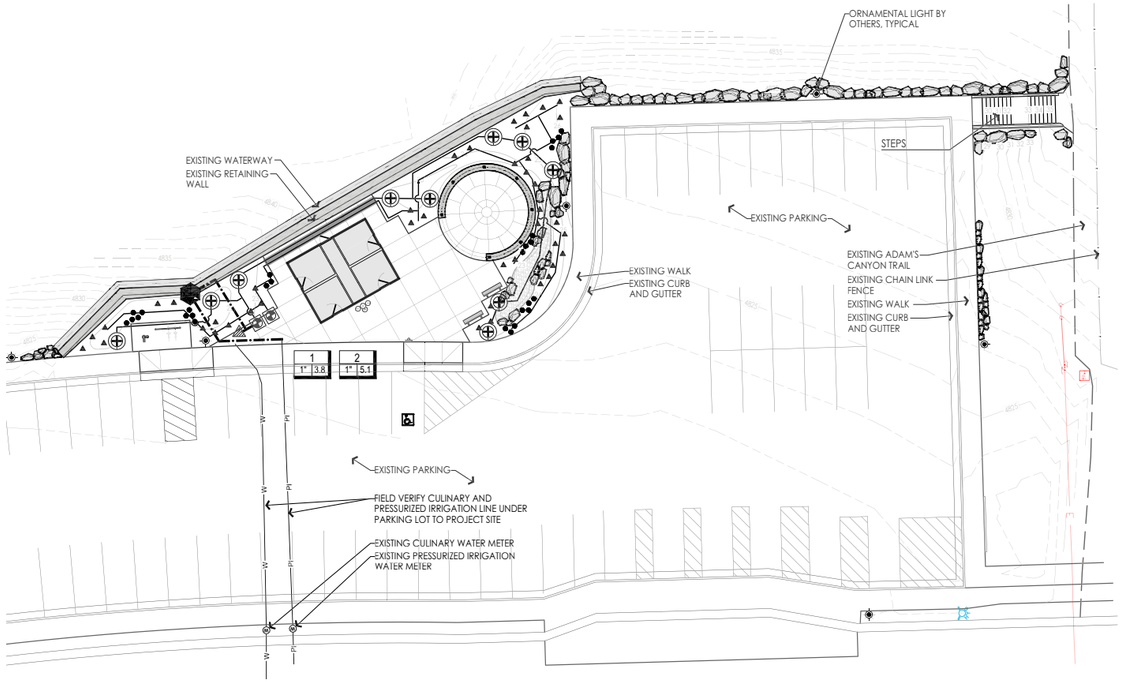
SHEET TITLE:
GRADING PLAN

SHEET NUMBER:
L201
LANDSCAPE



PLANTING PLAN

0 10 20 40 NORTH



IRRIGATION PLAN

0 10 20 40 NORTH

PLANT SCHEDULE

KEY	SYM.	QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.
TREES						
AGF	+	7	ACER GINNALA 'FLAME'	FLAME AMUR MAPLE - MULTI STEM	15 GAL.	CONT.
JSR		3	JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	8' HT.	B&B
SHRUBS						
AAL		3	AMELANCHIER ALNIFOLIA 'REGENT'	REGENT SASKATOON SERVICEBERRY	5 GAL.	CONT.
AXC		3	ARCTOSTAPHYLOS X COLORAD. 'CHIEFTAIN'	BEARBERRY MANZANITA	5 GAL.	CONT.
CIN		4	CERCOCARPUS INTRICATUS	LITTLE LEAF MOUNTAIN MOHAGANY	5 GAL.	CONT.
PFJ	+	10	POTENTILLA FRUITICOSA 'JACKMANII'	JACKMAN POTENTILLA	5 GAL.	CONT.
PBE		3	PRUNUS BESSEYI	WESTERN SAND CHERRY	5 GAL.	CONT.
RAG		19	RHUS AROMATICA 'GROW LOW'	GROW LOW FRAGRANT SUMAC	5 GAL.	CONT.
ORNAMENTAL GRASS						
HSS	⊗	27	HELICTOTRICHON SEMPERVIRENS 'SAPPHIRE'	BLUE OAT, AVENA GRASS	1 GAL.	CONT.

SOIL PEP
INSTALL A 4-INCH MINIMUM LAYER OF SOIL PEP. PROVIDE SAMPLE TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION. FINISH GRADE OF SOIL PEP TO BE LEVEL WITH ADJACENT CURBS, WALKS OR CONCRETE PLANTING EDGES.

REVEGETATION SEED MIX
SEED TO BE A MIX OF THE FOLLOWING:

ELYMUS CINEREUS	GREAT BASIN RYE
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM
BOUTELOUS GRACILISA	BLUE GRAMA
LINUM LEWISII	BLUE FLAX
PENSTEMON WHIPPLEANUS	WHIPPLE'S PENSTEMON
RUDEBECKI FLUGIDA	ORANGE CONEFLOWER

SEEDING NOTES:
1. SEEDING RATE TO BE: 6.0 POUNDS PURE LIVE SEED (PLS) OF EACH OF THE GRASS VARIETIES AND 1.0 POUND PLS OF BLUE FLAX AND 0.5 POUNDS PLS EACH OF PENSTEMON AND CONE FLOWER PER ACRE. A TOTAL OF 20 POUNDS PLS PER ACRE BROADCAST AND COVERED 1/4" DEEP.
2. DISTURBED AREAS INDICATED TO BE SEEDED WITH SPECIFIED SEED MIX.
3. SEEDING TO BE COMPLETED IN THE AUTUMN PRIOR TO AND AS CLOSE AS PRACTICAL TO WINTER STORM SEASON.
4. SEEDED AREA TO HAVE A TACKIFIER EMULSION OR ALTERNATE APPLIED AFTER SEEDING. TACKIFIER AND/OR ALTERNATE TO BE APPROVED BY LANDSCAPE ARCHITECT.

IRRIGATION LEGEND

SYM.	ITEM	PRESSURE (PSI)	FLOW
●	RAIN BIRD XERI-BUG EMITTER: XB SERIES WITH RAIN BIRD UNIVERSAL 1/4" TUBING STAKE: TS-025	30	EMITTER(S) FOR 2 GPH
▲	RAIN BIRD XERI-BUG EMITTER: XB SERIES WITH RAIN BIRD UNIVERSAL 1/4" TUBING STAKE: TS-025	30	EMITTER(S) FOR 6 GPH
◎	RAIN BIRD XFD-09-12-XXX ON-SURFACE DRIPLINE TUBING, EMITTERS 12" OC, ONE RING AT 12'r, ONE RING AT 36'r, OPTIONAL THIRD RING, SEE DETAIL	30	TOTAL FLOW w/ TWO RINGS = 23 GPH
	RAIN BIRD XCZ-100-PRB-COM SERIES DRIP CONTROL ZONE KIT (1" VALVE: 0.3 - 20 GPM.)		
	QUICK COUPLER VALVE, RAIN BIRD 44-LRC WITH MATCHING VALVE KEY AND HOSE SWIVEL ELL		
	LATERAL LINE (CIRCUIT PIPE), PVC SCH 40, SIZE AS INDICATED		
	MAIN LINE (PRESSURE PIPE), PVC SCH 40, SIZE 1"		
	IRRIGATION PIPE AND WIRING SLEEVE, PVC PIPE, SEE DETAIL		
	CONTROLLER: WEATHERTRAK, MODEL LC WITH FLOW, LOCATE IN CHASE/UTILITY ROOM OF RESTROOM BUILDING		
	FILTER ASSSEMBLY - SECONDARY WATER, SEE DETAIL: METER: EXISTING - FIELD VERIFY SHUT-OFF VALVE: MUELLER 1" BRASS BALL VALVE, AS REQUIRED BY LOCAL WATER JURISDICTION MANUAL DRAIN VALVE, SEE DETAIL QUICK COUPLER: RAIN BIRD QUICK COUPLER, 33-DRC FILTER: AMIAD 1" SUPER FILTER WITH 200 MICRON DISK ELEMENT MASTER VALVE: RAIN BIRD PEB VALVE.1" FLOW SENSOR: WEATHERTRAK FLOWHD - PLASTIC MODEL. 1" NOTE: ALL COMPONENTS OF MAIN LINE CONNECTION TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS		
XX / XXX	VALVE TAG VALVE NUMBER - CONTROLLER STATION VALVE SIZE FLOW IN GPM		

PLANTING NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES FOR FIELD LOCATION OF ALL UNDERGROUND UTILITIES, INCLUDING UTILITY DEPTHS, PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY AND ALL COST OR OTHER LIABILITY INCURRED DUE TO DAMAGE OF UTILITIES, STRUCTURES, ETC.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR BECOMING AWARE OF ALL RELATED EXISTING CONDITIONS, UTILITIES, PIPES, AND STRUCTURES, ETC. PRIOR TO BIDDING AND CONSTRUCTION.
3. IF CONFLICTS ARISE BETWEEN SITE CONDITIONS AND CONSTRUCTION DOCUMENTS, CONTRACTOR IS REQUIRED TO CONTACT OWNER'S REPRESENTATIVE FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE OWNER'S REPRESENTATIVE WILL RESULT IN THE CONTRACTOR BEING LIABLE TO RECONCILE CONFLICTS TO OWNER'S SATISFACTION. ALL ALTERATIONS TO THESE DRAWINGS SHALL BE RECORDED ON "AS BUILT" DRAWINGS BY THE CONTRACTOR.
4. THE CONTRACTOR IS RESPONSIBLE TO FURNISH ALL PLANT MATERIAL FREE OF PESTS AND/OR PLANT DISEASES WITH FULL AND NATURAL SHAPE AND SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN NURSERY ASSOCIATION. ALL PLANT MATERIAL IS SUBJECT TO OWNER'S APPROVAL PRIOR TO INSTALLATION.
5. PRE-SELECTED OR "TAGGED" MATERIAL MUST BE INSPECTED BY THE CONTRACTOR AND CERTIFIED PEST AND DISEASE FREE.
6. THE CONTRACTOR IS OBLIGATED TO MAINTAIN AND WARRANT ALL PLANT MATERIALS AS SPECIFIED.
7. PROVIDE MATCHING SIZES AND FORMS FOR EACH SPECIES OF TREES AND/OR PLANTS TO BE INSTALLED ON GRID OR SPACED IN ROWS AS INDICATED ON DRAWINGS. ALL PLANT MATERIAL TO BE PLANTED IN SUCH MANNER AS TO BE EQUALLY SPACED. PLANT LOCATIONS SUBJECT TO ACCEPTANCE BY THE OWNERS REPRESENTATIVE.+
8. THE LANDSCAPE CONTRACTOR SHALL SCHEDULE PLANTING OPERATIONS AND TAKE ALL NECESSARY PRECAUTIONS TO AVOID WINTER, CLIMATIC, WILDLIFE, OR OTHER PLANT DAMAGING CONDITIONS. NO PLANTING SHALL BE DONE PRIOR TO COMPLETION OF ROUGH GRADING.
9. CONTRACTOR SHALL PLACE A 12" DEEP LAYER MINIMUM OF TOPSOIL TO ALL SHRUB/PERENNIAL PLANTING AREAS. IMPORT TOPSOIL AS REQUIRED.
10. CONTRACTOR SHALL PLACE A 4" DEEP LAYER MINIMUM OF TOPSOIL TO ALL LAWN/TURF PLANTING AREAS. IMPORT TOPSOIL AS REQUIRED.
11. FOR ALL IMPORTED TOPSOIL CONTRACTOR TO PROVIDE A **SOIL TEST REPORT** BY A QUALIFIED SOIL TESTING LABORATORY. SOIL TEST REPORT TO BE SUBMITTED PRIOR TO TOPSOIL PLACEMENT. TOPSOIL SHALL BE WEED FREE, FERTILE, LOOSE, FRIABLE SOIL, AND MEET THE THE FOLLOWING CRITERIA:
CHEMICAL CHARACTERISTICS: PH: 5.5 TO 8.0; SOLUBLE SALTS: LESS THAN 3.0 MMHOS/CM; SODIUM ABSORPTION RATIO (SAR): LESS THAN 6.0; ORGANIC MATTER: GREATER THAN ONE PERCENT.
PHYSICAL CHARACTERISTICS: GRADATION AS DEFINED BY USDA TRIANGLE OF PHYSICAL CHARACTERISTICS AS MEASURED BY HYDROMETER. SAND: 15 TO 60 PERCENT; SILT: 10 TO 60 PERCENT; CLAY: 5 TO 30 PERCENT. CLEAN AND FREE FROM TOXIC MINERALS AND CHEMICALS, NOXIOUS WEEDS, ROCKS LARGER THAN OR EQUAL TO 1 1/2" IN ANY DIMENSION, AND OTHER OBJECTIONABLE MATERIALS. SOIL SHALL NOT CONTAIN MORE THAN FIVE PERCENT BY VOLUME OF ROCKS MEASURING OVER 1/4" IN LARGEST SIZE.
12. PITS FOR ALL PLANT MATERIAL SHALL BE DUG THREE TIMES THE DIAMETER OF THE ROOT BALL. DEPTH OF PLANT PITS TO BE AS INDICATED IN PLANTING DETAILS. EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE.
13. TREES LESS THAN TWO-INCH CALIPER MUST BE DOUBLE-STAKED UNTIL THE TREES MATURE TO A TWO-INCH CALIPER.
14. CONTRACTOR TO PRUNE TREES AS DIRECTED BY LANDSCAPE ARCHITECT FOR PROPER TREE SHAPING.
15. CONTRACTOR TO REMOVE ALL TAGS, TIES AND FLAGGING FROM ALL PLANT MATERIAL PRIOR TO SUBSTANTIAL COMPLETION.
16. PLANT BACKFILL MIXTURE SHALL BE COMPOSED OF 1 PARTS TOPSOIL TO 2 PARTS NATIVE SOIL. ROTARY MIXED ON-SITE PRIOR TO INSTALLATION.
17. ALL AREAS DISTURBED BY WORK OF THIS CONTRACT TO BE SEEDED WITH NATIVE GRASS AND WILDFLOWER SEED MIX. SEE PLANTING SCHEDULE FOR SEED MIX. SEEDING TO BE DONE AT THE LATTER PART OF THE GROWING SEASON PRIOR TO WINTER STORMS.

IRRIGATION NOTES

1. WORK SHALL CONFORM WITH STANDARDS OF LOCAL JURISDICTION.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ADEQUATE COVERAGE OF ALL PLANTS AND AREA TO BE IRRIGATED.
3. NO MAJOR REVISIONS IN THE DESIGN WILL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE LANDSCAPE ARCHITECT.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BECOME FAMILIAR WITH CONDITIONS OF THE SITE INCLUDING GRADES, LOCATIONS OF WALKS, STRUCTURES AND UTILITIES.
5. THE CONTRACTOR SHALL REPAIR OR REPLACE ALL ITEMS DAMAGED BY HIS WORK. HE SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS FOR THE LOCATION AND INSTALLATION OF PIPE SLEEVES AND LATERAL LINES THROUGH WALLS, AND UNDER HARD SURFACES. SLEEVES INSTALLED AT IMPROPER DEPTHS WILL BE RE-INSTALLED BY BORING METHODS.
6. CONTRACTOR SHALL NOT WILLFULLY INSTALL THE IRRIGATION SYSTEM COMPONENTS SHOWN ON THE PLAN WHEN FIELD CONDITIONS, INCLUDING UNKNOWN OBSTRUCTIONS, DIFFERENCES IN GRADE AND AREA DIMENSIONS EXIST THAT ARE NOT INCLUDED IN THE DESIGN. CONTRACTOR TO NOTIFY THE LANDSCAPE ARCHITECT WHEN SUCH OBSTRUCTIONS OR DIFFERENCES OCCUR. IN THE EVENT THIS NOTIFICATION IS NOT PERFORMED, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY REVISIONS OR CHANGE ORDERS.
7. 120V AC ELECTRICAL POWER SOURCE IS TO BE AT THE RESTROOM BUILDING. THE IRRIGATION CONTRACTOR SHALL MAKE THE FINAL CONNECTION FROM THE ELECTRICAL SOURCE TO THE CONTROLLER. REFER TO THE SPECIFICATIONS FOR ELECTRICAL REQUIREMENTS.
8. THE IRRIGATION CONTRACTOR SHALL ADJUST VALVES, FLUSH AND ADJUST IRRIGATION CIRCUITS FOR OPTIMUM OPERATION.
9. THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REFUSE MATERIAL OR WORK WHICH DOES NOT CONFORM TO THE CONSTRUCTION DOCUMENTS. REJECTED WORK SHALL BE BE REMOVED OR CORRECTED AS SOON AS POSSIBLE A THE CONTRACTOR'S EXPENSE.
10. GUARANTEE: ALL WORK SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF ACCEPTANCE AGAINST ALL DEFECTS IN MATERIAL, EQUIPMENT, AND WORKMANSHIP. GUARANTEE SHALL ALSO COVER REPAIR FOR DAMAGE TO ANY PART OF THE PROJECT PROPERTY RESULTING FROM LEAKS OR OTHER DEFECTS IN MATERIAL, EQUIPMENT OR WORKMANSHIP, TO THE SATISFACTION OF THE OWNER. REPAIRS, IF REQUIRED, SHALL BE COMPLETED PROMPTLY AND AT NO COST TO THE OWNER.
11. INSTALL CONTROLLERS AND REQUIRED CONTROLLER GROUNDING AS PER MANUFACTURER'S WRITTEN INSTRUCTIONS. COORDINATE LOCATION WITH LANDSCAPE ARCHITECT. IRRIGATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING CONDUITS AND WIRING FROM VALVES TO CONTROLLERS.
12. THE IRRIGATION PLAN IS DRAWN DIAGRAMMATICALLY FOR CLARITY. IT IS THE INTENT TO HAVE ALL PIPING, VALVES, AND WIRING TO BE LOCATED IN PLANTING AREAS, WITH THE EXCEPTION OF LOCATIONS REQUIRED FOR HARD SURFACE CROSSINGS. ADDITIONAL SLEEVES WILL BE REQUIRED. ALL IRRIGATION SLEEVES MAY NOT BE SHOWN.
13. ESTIMATED STATIC WATER PRESSURE AT POINT OF CONNECTION: 80 PSI. CONTRACTOR IS TO NOTIFY LANDSCAPE ARCHITECT IN WRITING IF STATIC PRESSURE IS LESS.
14. PRIOR TO ACCEPTANCE OF WORK AND AS PART OF THE IRRIGATION PUNCH LIST THE CONTRACTOR SHALL CONDUCT A MEETING WITH THE OWNER TO DEMONSTRATE THE OPERATION OF THE ENTIRE IRRIGATION SYSTEM INCLUDING WINTERIZATION AND START-UP PROCEDURES AND PROVIDE A RECOMMENDED IRRIGATION SCHEDULE. REMOTE OPERATING EQUIPMENT, IF ANY, SHALL BE GIVEN TO OWNER AT THIS TIME.
15. ALL VALVE BOXES TO BE SUPPORTED WITH BRICK / CONCRETE MASONRY UNIT.
16. LOCATE IRRIGATION CONTROL VALVES IN LANDSCAPE AREAS, ADJACENT TO WALKS OR CURBS.
17. IRRIGATION SYSTEM WIRING LOCATED APART FROM IRRIGATION MAIN LINE TO BE PLACED IN GRAY PVC SLEEVES OF ADEQUATE SIZE.
18. CONTRACTOR TO CONDUCT A SYSTEM PRESSURE TEST IN THE PRESENCE OF THE LANDSCAPE ARCHITECT PRIOR TO BACKFILLING MAIN LINE TRENCHES. CONTRACTOR TO NOTIFY THE LANDSCAPE ARCHITECT TWO WORKING DAYS MINIMUM PRIOR TO CONDUCTING THE SYSTEM PRESSURE TEST. PRESSURE TEST MAIN LINE AND ALL VALVES INSTALLED AT 100 PSI FOR 2 HOURS MINIMUM.

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02 MAY 2022

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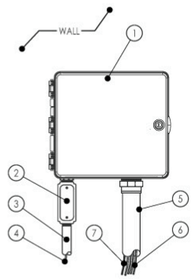
450 NORTH EASTSIDE DRIVE LAYTON UTAH

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

02 MAY 2022 - PERMIT AND BID SET

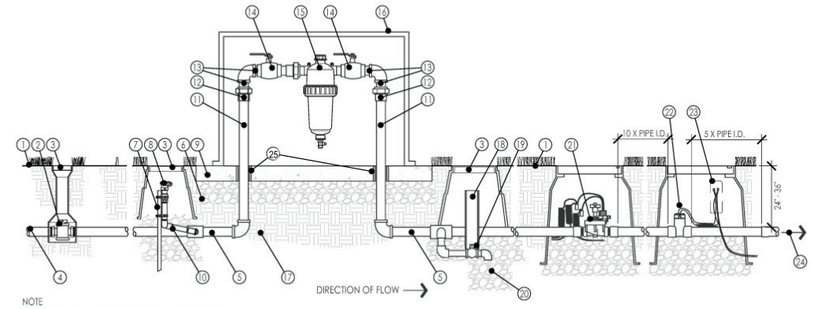
SHEET TITLE:
PLANTING / IRRIGATION PLAN
SHEET NUMBER:
L301
LANDSCAPE



1. IRRIGATION CONTROLLER
2. JUNCTION BOX
3. 1" CONDUIT AND FITTINGS TO POWER SUPPLY
4. POWER SUPPLY WIRE
5. CONDUIT AND FITTINGS FOR STATION WIRES
6. REMOTE CONTROL VALVE WIRES
7. FLOW SENSOR WIRE (WHEN INDICATED) TO FLOW SENSOR

NOTES:
1. CONTROLLER TO BE MOUNTED AT EYE-LEVEL.
2. USE STEEL CONDUIT FOR ABOVE GRADE AND SCH 40 PVC CONDUIT FOR BELOW GRADE CONDITIONS.
3. PROVIDE PROPER GROUNDING PER MANUFACTURER'S WRITTEN INSTRUCTIONS

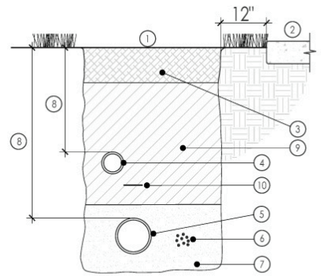
CONTROLLER, INTERIOR WALL MOUNT 1



NOTE
1. ALL VALVE BOXES TO HAVE BRICK FOUNDATIONS.
3. LOCATION OF FILTER TO BE APPROVED BY LANDSCAPE ARCHITECT.

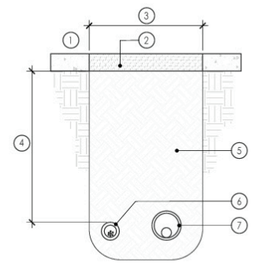
1. FINISH GRADE
2. SHUT-OFF, BALL VALVE
3. VALVE BOX, SIZE OF BOX TO ACCOMMODATE EQUIPMENT, TYPICAL
4. MAINLINE DOWNSTREAM FROM PRESSURIZED IRRIGATION UTILITY MAIN LINE
5. MAIN LINE, SIZED AS REQUIRED
6. 3/4" WASHED GRAVEL, 6" DEPTH
7. #4 REBAR DRIVEN INTO UNDISTURBED SOIL 18" MIN.
8. QUICK COUPLER VALVE, SEE IRRIGATION LEGEND, STRAP TO REBAR USING STAINLESS STEEL SCREW CLAMPS, (2) MIN.
9. 4" CONCRETE SLAB
10. SWING PIPE ASSEMBLY
11. VERTICAL PIPE ABOVE GRADE TO AND FROM FILTER TO BE GALVANIZED
12. DIELECTRIC UNION
13. BRASS FITTINGS BETWEEN DIELECTRIC UNION AND FILTER
14. BRONZE VALVE
15. FILTER, SEE IRRIGATION LEGEND
16. STAINLESS STEEL SOLID PANEL SECURITY ENCLOSURE BY STRONG BOX BY V.I.T. PRODUCTS. PROVIDE ENCLOSURE OF ADEQUATE SIZE TO ACCOMMODATE FILTER. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
17. COMPACTED SUB GRADE
18. PVC SLEEVE
19. MANUAL DRAIN VALVE
20. GRAVEL SUMP, 18" x 18" x 18" MINIMUM
21. MASTER VALVE WITH 36" LENGTH OF COILED WIRE TO CONTROLLER
22. FLOW SENSOR WITH 36" LENGTH OF COILED WIRE TO FLOW SENSING EQUIPMENT AT CONTROLLER
23. WIRE SPLICE, SEE MANUFACTURER'S WRITTEN INSTRUCTIONS
24. MAIN LINE TO CONTROL VALVES
25. PVC SLEEVES THROUGH CONCRETE, SIZED TO ACCOMMODATE MAIN LINE

MAIN LINE CONNECTION ASSEMBLY - NON POTABLE WATER 2



1. IF LAWN IS EXISTING, REPLACE SOD AS PER OWNER'S SPECIFICATIONS
2. ADJACENT HARD SURFACE
3. TOPSOIL FREE FROM ROCKS GREATER THAN 1" DIAMETER. LAYER THICKNESS AS INDICATED IN PLANTING NOTES
4. NON-PRESSURE LATERAL LINE
5. PRESSURE MAIN LINE
6. DIRECT BURIAL, LOW VOLTAGE CONTROL WIRES; TAPE AND BUNDLE AT 10' O.C. PLACE 6" EITHER SIDE, OR 6" BELOW MAIN LINE PIPE.
7. MORTAR SAND BEDDING 2" BELOW AND ABOVE PIPE
8. PIPE DEPTHS:
   MAIN LINE: 24 - 30" COVER
   LATERAL LINE: 8 - 16" COVER
9. BACKFILL SOIL FREE FROM ROCKS GREATER THAN 1" DIAMETER.
10. DECTABLE WARNING TAPE AT MAIN LINE

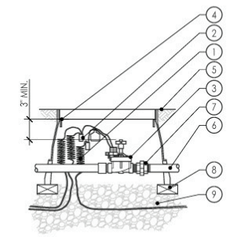
TRENCH DETAIL 3



1. CONCRETE OR ASPHALT PAVING
2. EXISTING HARD SURFACE TO BE SAWCUT, PATCH AS REQUIRED
3. WIDTH AS REQUIRED
4. DEPTH TO BE 24" MIN. OR TO MATCH MAIN LINE AS REQUIRED
5. COMPACTED BACKFILL FREE FROM ROCK GREATER THAN 1" IN DIAMTER
6. CONTROL WIRE SLEEVE TO BE 6" TO EITHER SIDE OR 6" BENEATH MAIN LINE
7. MAIN LINE / LATERAL LINE IN PVC SLEEVE

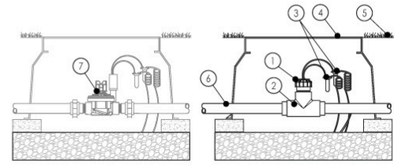
NOTE:
1. SLEEVES 4" AND SMALLER TO BE PVC SCH. 40 PIPE.
2. SLEEVES LARGER THAN 4" TO BE PVC CLASS 200 PIPE.
3. ALL SLEEVES TO BE 2" LARGER THAN PIPE TO BE SLEEVED.
4. SLEEVES FOR WIRING TO BE 2" LARGER I.D. THAN CONTROL WIRE BUNDLE.
5. CONCRETE OR ASPHALT PATCH TO MATCH EXISTING CONCRETE OR ASPHALT CUT FOR PIPE TRENCH.

SLEEVES FOR IRRIGATION PIPE AND WIRE 4



1. 30" LINEAR LENGTH OF WIRE, COILED
2. WATERPROOF CONNECTION (3M-DBR/Y-6), TYPICAL
3. MASTER VALVE, SEE IRRIGATION SCHEDULE
4. VALVE BOX WITH COVER
5. FINISH GRADE
6. MAIN LINE
7. PVC UNION
8. BRICK, 1 OF 4
9. 3" MIN. DEPTH OF 3/4" WASHED GRAVE.

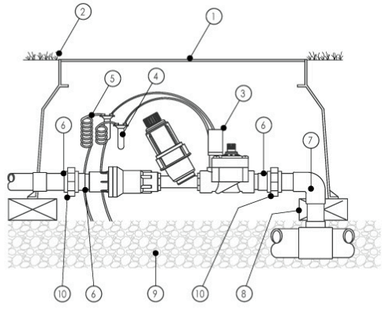
MASTER VALVE (1") 5



1. FLOW SENSOR
2. SENSOR RECEPTACLE TEE
3. MIN. 18/2 WIRE TO ACC POWER MODULE. MAXIMUM WIRE DISTANCE RUN OF 1,000'
4. STANDARD VALVE BOX
5. FINISH GRADE
6. MAIN LINE PIPE
7. MASTER VALVE

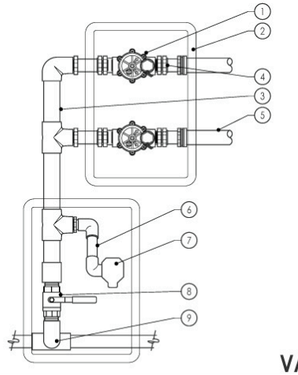
NOTE:
1. INLET PIPE LENGTH OF FLOW SENSOR MUST BE MIN. 10X PIPE DIA. STRAIGHT, CLEAN RUN OF PIPE, NO FITTINGS OR TURNS. OUTLET PIPE LENGTH OF FLOW SENSOR MUST BE MIN. 5X PIPE DIA. OF STRAIGHT CLEAN RUN OF PIPE, NO FITTINGS OR TURNS.

FLOW SENSOR 6



1. VALVE BOX
2. FINISH GRADE
3. DRIP ZONE KIT, SEE IRRIGATION LEGEND
   TIP FILTER TO 45 DEGREES
   REGULATOR: 25 PSI
4. DBY (2)
5. 18 - 24" COILED WIRE
6. SCH. 80 PVC NIPPLE
7. MAIN LINE PIPE AND FITTINGS
8. BRICK FOUNDATION (4)
9. 3/4" MINUS WASHED GRAVEL
10. PVC SLIP UNIONS

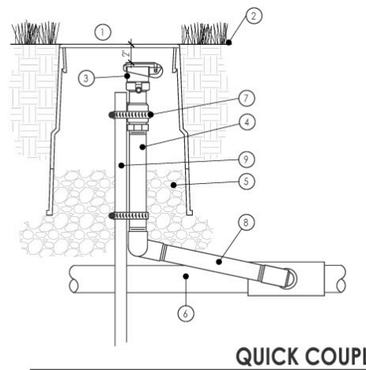
DRIP CONTROL ZONE KIT 7



1. ELECTRIC REMOTE CONTROL VALVE, TYPICAL
2. JUMBO VALVE BOX, TYPICAL
3. SCH. 40 PVC PIPE AND FITTINGS
4. O-RING MANIFOLD FITTINGS, DURA 332-020
5. SCH 40 PVC PIPE TO CIRCUIT, TYPICAL
6. 1" SWING JOINT ASSEMBLY
7. 3/4" QUICK COUPLER VALVE
8. 1" BALL VALVE, APOLLO 70-108
9. 1" PVC SCH 80 90 ELL

NOTE:
1. PRO SERIES VALVE BOXES ARE NOT ACCEPTABLE.

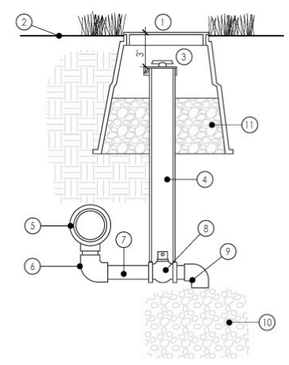
VALVE MANIFOLD ASSEMBLY 8



1. 10" ROUND PLASTIC VALVE BOX,
2. FINISH GRADE
3. QUICK COUPLER - SEE IRRIGATION LEGEND (MOUNT 4 - 6" BELOW GRADE)
4. 1" GALVANIZED RISER, LENGTH AS REQUIRED
5. 6" MIN. DEPTH 3/4" WASHED GRAVEL
6. MAIN SUPPLY LINE
7. SECURE VALVE TO REBAR WITH (2) MIN. STAINLESS STEEL SCREW CLAMPS
8. 1" DOUBLE ELBOW SWING JOINT ASSEMBLY
9. #4 REBAR, DRIVEN INTO SOIL 18" MIN.

NOTE:
1. INSTALL (1) QUICK COUPLING VALVE IN LOCATIONS INDICATED ON PLAN
2. INSTALL VALVE BOX SO TOP OF BOX IS AT FINISH GRADE IN TURF AND 2" ABOVE FINISH GRADE IN PLANTING AREAS.
3. TOP OF QUICK COUPLER VALVE TO HAVE 3" MIN. CLEARANCE FROM VALVE BOX LID

QUICK COUPLING VALVE ASSEMBLY 9



1. 10" ROUND VALVE BOX W/ LOCK BOLT
2. FINISH GRADE
3. LOCKING CAP PERMANENTLY ATTACHED TO SLEEVE. 4" CLEAR
4. 2" PVC SCH. 40 SLEEVE NOTCHED OVER VALVE
5. PVC SCH. 80 TEE & MAIN LINE
6. 3/4" PVC SCH. 80 ELBOW
7. 3/4" PVC SCH. 80 NIPPLE (LENGTH AS REQUIRED)
8. 3/4" BALL VALVE
9. 3/4" MARLEX STREET ELBOW
10. GRAVEL SUMP - 18" x 18" x 12" MIN. SIZE
11. 3/4" GRAVEL, FILL TO 3" BELOW TOP OF SLEEVE

NOTE:
1. ALL PVC NIPPLES TO BE SCH. 80
2. PROVIDE VALVE KEY TO OWNER
3. INSTALL AT ALL LOW POINTS OF MAIN LINE FOR ADEQUATE DRAINAGE

MANUAL DRAIN VALVE ASSEMBLY 10

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LICENSED LANDSCAPE ARCHITECT
CURTIS R TANNER
NO. 198779
STATE of UTAH

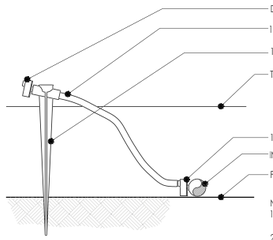
02 MAY 2022

ADAM'S CANYON TRAILHEAD IMPROVEMENTS
450 NORTH EASTSIDE DRIVE LAYTON UTAH

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

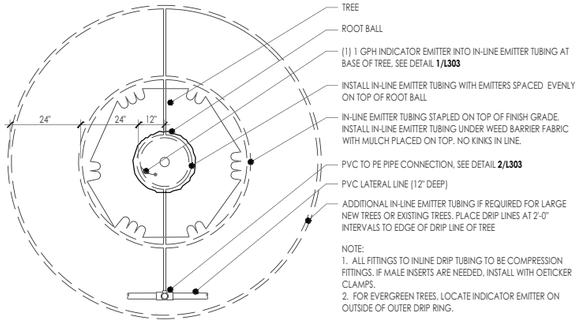
02 MAY 2022 - PERMIT AND BID SET

SHEET TITLE:
PLANTING / IRRIGATION DETAILS
SHEET NUMBER:
L302
LANDSCAPE

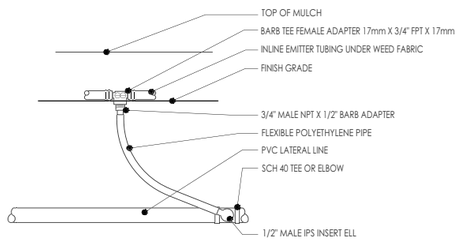


NOTE:
1. CONNECT SELF-PIERCING EMITTER DIRECTLY INTO IN-LINE EMITTER TUBING.
2. THIS IS AN INDICATOR EMITTER ONLY, TO BE USED AT EACH TREE RING AND AREA WHERE IN-LINE EMITTER TUBING IS INSTALLED.
3. 1/4" TUBING LENGTH: MINIMUM 14", MAXIMUM 24".

INDICATOR EMITTER 1

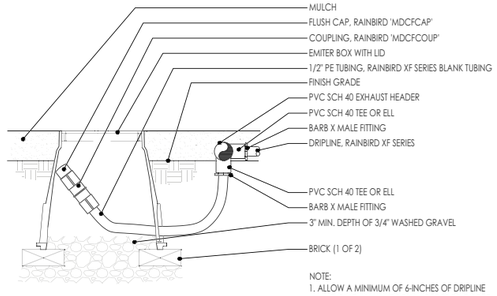


NOTE:
1. ALL FITTINGS TO INLINE DRIP TUBING TO BE COMPRESSION FITTINGS. IF MALE INSERTS ARE NEEDED, INSTALL WITH OETICKER CLAMPS.
2. FOR EVERGREEN TREES, LOCATE INDICATOR EMITTER ON OUTSIDE OF OUTER DRIP RING.

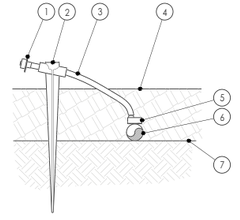


NOTE:
1. USE AT TREE RINGS ONLY, REFER TO DETAIL **4/L303**

PVC TO IN-LINE EMITTER 2



NOTE:
1. ALLOW A MINIMUM OF 6-INCHES OF DRIPLINE TUBING IN VALVE BOX IN ORDER TO DIRECT FLUSHED WATER OUTSIDE VALVE BOX.

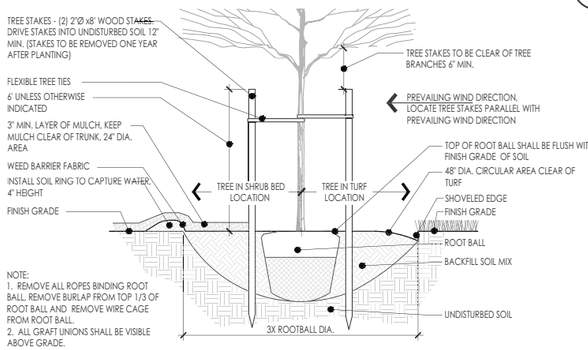


1. DIFFUSER BUG CAP
2. TUBING STAKE
3. DISTRIBUTION TUBING, 36" MAX. LENGTH
4. TOP OF MULCH
5. SINGLE-OUTLET BARB INLET X BARB OUTLET EMITTER
6. 1/2" POLYETHYLENE TUBING
7. FINISH GRADE

NOTES:
1. INSTALL EMITTER PER MANUFACTURER'S WRITTEN INSTRUCTIONS

DRIP EMITTER WITH DISTRIBUTION TUBING 3

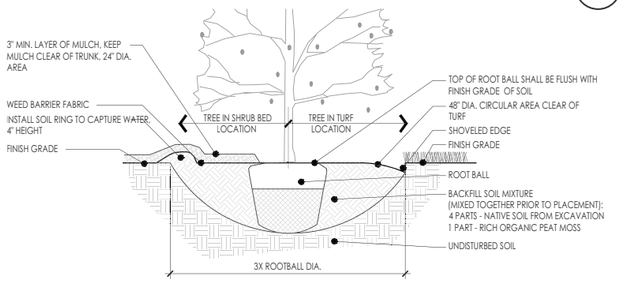
TREE IN-LINE EMITTER TUBING LAYOUT (PLANTER AREAS) 4



NOTE:
1. REMOVE ALL ROPES BINDING ROOT BALL. REMOVE BURLAP FROM TOP 1/3 OF ROOT BALL AND REMOVE WIRE CAGE FROM ROOT BALL.
2. ALL GRAFT UNIONS SHALL BE VISIBLE ABOVE GRADE.

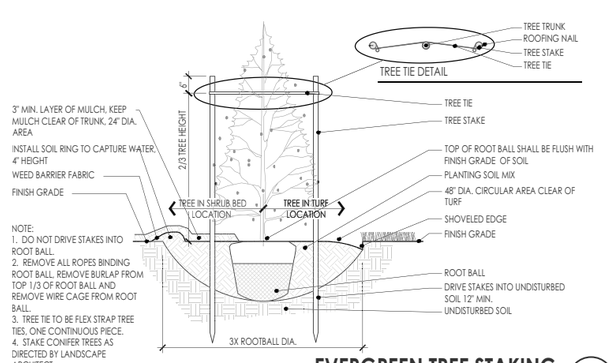
DECIDUOUS TREE PLANTING 6

DRIPLINE FLUSH POINT 5



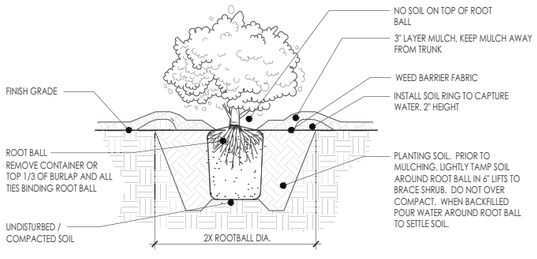
NOTE:
1. STAKE OR GUY EVERGREEN TREES AS INDICATED AND AS REQUIRED BY LANDSCAPE ARCHITECT.
2. REMOVE ALL ROPES BINDING ROOT BALL. REMOVE BURLAP FROM TOP 1/3 OF ROOT BALL AND REMOVE WIRE CAGE FROM ROOT BALL.

EVERGREEN TREE PLANTING 7



NOTE:
1. DO NOT DRIVE STAKES INTO ROOT BALL.
2. REMOVE ALL ROPES BINDING ROOT BALL. REMOVE BURLAP FROM TOP 1/3 OF ROOT BALL AND REMOVE WIRE CAGE FROM ROOT BALL.
3. TREE TIE TO BE FLEX STRAP TREE TIES, ONE CONTINUOUS PIECE.
4. STAKE CONIFER TREES AS DIRECTED BY LANDSCAPE ARCHITECT.

EVERGREEN TREE STAKING 8



NOTE:
1. TOP OF ROOT BALL TO BE 1" ABOVE FINISH GRADE OF SOIL WHEN PLANTED.

SHRUB PLANTING 9

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LICENSED LANDSCAPE ARCHITECT
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450 NORTH EASTSIDE DRIVE LAYTON UTAH

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SHEET TITLE:
PLANTING / IRRIGATION DETAILS
SHEET NUMBER:
L303
LANDSCAPE

ELECTRICAL SPECIFICATIONS

GENERAL PROVISION

A. REFERENCE
1. THE GENERAL CONDITIONS AND OTHER CONTRACT DRAWINGS AS SET FORTH IN THE FOREGOING PAGES ARE HEREBY INCORPORATED INTO AND BECOME A PART OF THE SPECIFICATIONS FOR WORK UNDER THIS TITLE, INSOFAR AS THEY APPLY HERETO.
2. ALL SPECIFICATIONS UNDER THIS DIVISION TITLE ARE DIRECTED TO AND ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, UNLESS OTHER TRADES OR PERSONS ARE SPECIFICALLY MENTIONED, "ELECTRICAL CONTRACTOR" IS INFERRED AND INTENDED.

B. CONTRACT DRAWINGS
1. THE DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS IF CALLED FOR BY BOTH.
2. CONSULT ALL CONTRACT DRAWINGS WHICH MAY AFFECT THE LOCATION OF EQUIPMENT, CONDUIT AND WIRING AND MAKE MINOR ADJUSTMENTS IN LOCATION TO SECURE COORDINATION.
3. WIRING LAYOUT IS SCHEMATIC AND EXACT LOCATIONS SHALL BE DETERMINED BY FIELD CONDITIONS.
4. OTHER THAN MINOR ADJUSTMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.

C. JOB-SITE COPY OF DOCUMENTS
1. MAINTAIN AT THE SITE, ONE COPY OF ALL DRAWINGS, SPECIFICATIONS, ADDENDA APPROVED SHOP DRAWINGS, CHANGE ORDERS AND OTHER MODIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THESE SHALL BE AVAILABLE TO THE OWNER'S REPRESENTATIVE. THE DRAWINGS MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR THE OWNER UPON COMPLETION OF THE WORK. AN ADDITIONAL SET OF DRAWINGS WILL BE FURNISHED BY THE OWNER'S REPRESENTATIVE FOR THIS PURPOSE UPON REQUEST.

D. MANUFACTURER'S DRAWINGS
1. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR REVIEW. (6) COPIES OF MANUFACTURER'S DRAWINGS AND WIRING DIAGRAMS. THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTALS (AS INDICATED BELOW) WITH RESPECT TO THE ABILITY OF THE DETAILED WORK, WHEN COMPLETE, TO BE A PROPERLY FUNCTIONING INTEGRAL ELEMENT OF THE OVERALL SYSTEM DESIGNED BY THE ENGINEER. BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL TO THE ENGINEER, CONTRACTOR SHALL: REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF CONTRACTOR: APPROVE EACH SUCH SUBMISSION BEFORE SUBMITTING IT; AND SO STAMP EACH SUCH SUBMISSION BEFORE SUBMITTING IT. THE ENGINEER SHALL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPRISES A VARIATION UNLESS CONTRACTOR ADVISES ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY ENGINEER IN WRITING. THE ITEMS, TYPES OF SUBMITTALS AND RELATED MATERIAL (IF ANY) CALLED FOR ARE INDICATED BELOW:

ITEMS REQUESTED	TYPE SUBMITTALS
LIGHTING AND POWER PANELS	SHOP DRAWINGS
LIGHTING FIXTURES	CATALOG CUTS

E. GUARANTEES
1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AS DETERMINED BY THE OWNER'S REPRESENTATIVE. PRODUCT GUARANTEES GREATER THAN ONE (1) YEAR SHALL BE PASSED ALONG TO THE OWNER FOR FULL BENEFIT OF THE MANUFACTURER'S WARRANTY.

WORK INCLUDED

A. INSTALLATION, MATERIALS, AND WORKMANSHIP
1. FURNISH AND INSTALL ALL NECESSARY ANCHORS, SUPPORTS, STRAPS, BOXES, FITTINGS AND OTHER SIMILAR APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM CONSISTENT WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.
2. THE ELECTRICAL CONTRACTOR, INSOFAR AS THE WORK IS CONCERNED, SHALL AT ALL TIMES KEEP THE PREMISES IN A NEAT AND ORDERLY CONDITION. AND AT THE COMPLETION OF THE WORK, SHALL PROPERLY CLEAN UP AND CART AWAY DEBRIS AND EXCESS MATERIALS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF DUMPSTER & REFUSED DISPOSAL AS REQUIRED FOR ELECTRICAL WORK.
3. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.

B. COORDINATION OF PLANS AND SPECIFICATIONS
1. CONTACT THE OWNER'S REPRESENTATIVE IMMEDIATELY IF THERE IS ANY QUESTIONS REGARDING THE MEANING OR INTENT OF EITHER PLANS OR SPECIFICATIONS, OR UPON NOTICING ANY DISCREPANCIES OR OMISSIONS IN EITHER PLANS OR SPECIFICATIONS.

C. CUTTING AND PATCHING
1. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
2. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE OF THE WORK.
3. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE, ALL CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.

CODES AND FEES

A. CODES:
1. ALL WORK PERFORMED UNDER THIS SPECIFICATION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS PREPARED AND PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND ANY APPLICABLE STATE OR LOCAL CODES.

B. FEES:
1. OBTAIN AND PAY FOR ANY AND ALL PERMITS REQUIRED BY ALL LAWS AND REGULATIONS AND PUBLIC AUTHORITY HAVING SUCH JURISDICTION.

TESTS AND INSPECTIONS

A. OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS OR PUBLIC AUTHORITY HAVING JURISDICTION AND OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE OWNER'S REPRESENTATIVE. PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREIN. OBTAIN OCCUPANCY PERMIT AS REQUIRED BY OWNER. FINAL PAYMENT SHALL NOT BE MADE UNTIL OCCUPANCY PERMIT IS OBTAINED.
B. WORK SHALL BE UNACCEPTABLE WHEN FOUND TO BE DEFECTIVE OR CONTRARY TO THE PLANS SPECIFICATIONS, CODES SPECIFIED OR ACCEPTED STANDARDS OF GOOD WORKMANSHIP.
C. THE CONTRACTOR SHALL PROMPTLY CORRECT ALL WORK FOUND UNACCEPTABLE BY THE OWNER'S REPRESENTATIVE WHETHER OBSERVED BEFORE OR AFTER SUBSTANTIAL COMPLETION AND WHETHER OR NOT FABRICATED, INSTALLED OR COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS OF CORRECTING SUCH UNACCEPTABLE WORK, INCLUDING COMPENSATION FOR THE OWNERS REPRESENTATIVE ADDITIONAL SERVICES MADE NECESSARY THEREBY.

CONDUIT

A. FURNISH AND INSTALL ALL CONDUITS, BOXES, FITTINGS, ETC., FOR A COMPLETE RACEWAY SYSTEM.
B. ALL WIRING SHALL BE RUN IN EMT CONDUIT OR MC CABLE WITH GROUND CONDUCTOR UNLESS OTHERWISE NOTED.
C. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN ½" UNLESS OTHERWISE NOTED.
D. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.

WIRE AND CABLE

A. ALL CONDUCTORS SHALL BE COPPER AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS. WHERE NO SIZE OR TYPE IS SHOWN. CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE XHHW, THHN, OR THWN. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED COPPER AND HAVE 600 VOLT INSULATION; BE UL LABELED AND OF AMERICAN MANUFACTURER.
B. ALL CONNECTIONS ARE TO BE MADE USING PRESSURE TYPE TERMINALS.
C. THE FOLLOWING COLOR CODE SHALL BE USED:

	120/240 VOLT	120/208 VOLT	277/480 VOLT
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C		BLUE	YELLOW
NEUTRAL	WHITE	WHITE	WHITE
GROUND	GREEN	GREEN	GREEN

D. CONDUCTORS NO. 10 AWG OR SMALLER SHALL HAVE INSULATION COLORED AS NOTED ABOVE.
E. CONDUCTORS NO. 8 AWG OR LARGER SHALL HAVE INSULATION COLORED AS NOTED ABOVE OR COLORED TAPE, MINIMUM SIZE ½", WRAPPED TWICE AROUND AT THE FOLLOWING POINTS:
1. AT EACH TERMINAL
2. AT EACH CONDUIT ENTRANCE
3. AT INTERVALS NOT MORE THAN 12 INCHES APART IN ALL BOXES, PANEL TUBS, SWITCHBOARDS, ETC

G. ALL BRANCH CIRCUITS SHALL BE MARKED IN THE PANEL BOARD GUTTERS. MARKERS SHALL INDICATE CORRESPONDING BRANCH--CIRCUIT NUMBERS.
H. EACH BRANCH CIRCUIT REQUIRING A NEUTRAL SHALL BE FURNISHED WITH A SEPARATE INDIVIDUAL NEUTRAL CONDUCTOR.

BOXES AND PLATES

A. FURNISH AND INSTALL ALL OUTLET, JUNCTION, AND PULL BOXES AS INDICATED ON THE DRAWINGS AND AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND WORKMANLIKE MANNER.
B. PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED AND OF THE CORRECT SIZE AND GAUGE, SIZED IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE U.L. LABELED.
C. BOXES AT EXTERIOR AREAS TO BE WATERTIGHT AND DUST-TIGHT WITH GASKETED COVERS.
D. ALL BOXES FOR EXPOSED WORK IN FINISHED SPACES SHALL BE "FS" TYPE WITH THREADED HUBS WITH RIGID CONDUIT RISER (DEEP WIRE MOLD BOXES)
E. ALL BOXES SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF THE CONDUIT SYSTEM. BOXES CAST INTO MASONRY OR CONCRETE ARE CONSIDERED TO BE RIGIDLY SUPPORTED.
G. UNDERGROUND BOXES/ENCLOSURES:
1. DESCRIPTION: IN-GROUND, OPEN BOTTOM BOXES FURNISHED WITH FLUSH, NON-SKID COVERS WITH LEGEND INDICATING TYPE OF SERVICE AND STAINLESS STEEL TAMPER RESISTANT COVER BOLTS.
2. SIZE: AS INDICATED ON DRAWINGS.
3. DEPTH: AS REQUIRED TO EXTEND BELOW FROST LINE TO PREVENT FROST UPHEAVAL, BUT NOT LESS THAN 12 INCHES.
4. APPLICATIONS:
   a. SIDEWALKS AND LANDSCAPED AREAS SUBJECT ONLY TO OCCASIONAL NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SCTE 77, TIER 8 LOAD RATING.
   b. PARKING LOTS, IN AREAS SUBJECT ONLY TO OCCASIONAL NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SCTE 77, TIER 15 LOAD RATING.
   c. DO NOT USE POLYMER CONCRETE ENCLOSURES IN AREAS SUBJECT TO DELIBERATE VEHICULAR TRAFFIC.

H. COMPOSITE UNDERGROUND BOXES/CONCLOSURES: COMPLY WITH SCTE 77.

IDENTIFICATION

A. EACH PIECE OF SERVICE EQUIPMENT AND INDIVIDUAL SWITCHES, ALL DISCONNECTS, STARTERS, ALL EXHAUST FAN MANUAL STARTING SWITCHES.
B. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK RACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND, MINIMUM ¼" HIGH. PLATES SHALL BE DRILLED ON EACH END FOR SHEET METAL SCREW ATTACHMENT. NO "DYMO" OR SIMILAR TYPE LABELS WILL BE ALLOWED.
C. PANEL BOARD DIRECTORY: A TYPED CIRCUIT DIRECTORY SHALL BE PROVIDED INDICATING LOCAL AREA SERVED AND LOCATION FOR EACH BRANCH CIRCUIT.

GROUNDING

A. ALL FEEDERS AND BRANCH CIRCUITS OVER 100 VOLTS SHALL INCLUDE A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250-122, EXCEPT NOT BE SMALLER THAN #12 FOR POWER AND LIGHTING CIRCUITS AND #14 FOR CONTROL CIRCUITS. ALL GROUND CONDUCTORS SHALL BE GREEN, OR AS SPECIFIED UNDER "WIRE AND CABLE".
B. ALL GROUND CLAMPS SHALL BE PENN-UNION "GPL" TYPE OR SIMILAR BY O.Z. OR BURNDY.
C. CONDUIT FOR SOLITARY GROUND CONDUCTORS SHALL BE RIGID SCHEDULE 40 PVC NON- METALLIC ELECTRICAL CONDUIT WITH U.L. LABEL SOLITARY GROUND CONDUCTORS SHALL NOT BE PLACED THROUGH METALLIC SLEEVES OR CONDUITS AND SHALL NOT BE COMPLETELY ENCIRCLED BY METALLIC HANGERS OR SUPPORTS.
D. THE GROUND CONDUCTOR SHALL BE CONNECTED TO THE NEUTRAL IN ONLY TWO LOCATIONS -ON THE SUPPLY SIDE OF THE SERVICE DISCONNECT MEANS PER NEC--250--24 AND ON SEPARATELY DERIVED SYSTEMS PER NEC 250-30.
E. AT EACH RECEPTACLE BOX, THE GROUND CONDUCTOR SHALL ENTER AND CONNECT, WITH NORMAL WIRING CONNECTOR, TO: 1) THE GROUND PIGTAIL TO RECEPTACLE: 2) THE GROUND PIGTAIL TO THE BOX GROUND SCREW; AND 3) THE OUTGOING GROUND CONDUCTOR TO NEXT DEVICE, IF NOT AT END OF RUN. METAL TO METAL CONTACT BETWEEN THE DEVICE YOKE AND THE OUTLET BOX IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE. MOUNTED BOXES OR FLUSH TYPE BOXES.
F. CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS SHALL CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES. WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS. WHERE REDUCING WASHERS ARE USED AND WHERE CONCENTRIC OR ECCENTRIC KNOCKOUTS ARE NOT COMPLETELY REMOVED BONDING BUSHINGS SHALL BE REQUIRED.

POWER AND LIGHTING PANELS

A. FURNISH AND INSTALL, AS SCHEDULED AND SHOWN ON THE DRAWINGS, POWER PANELS FOR OPERATION ON VOLTAGES INDICATED.
B. ALL TERMINATIONS SHALL BE MARKED "75°C ONLY", "60/75° C" OR LISTED FOR USE OF 75° C INSULATED CONDUCTORS AT FULL 75° C AMPACITY.
C. ALL BUS BARS SHALL BE SILVER OR TIN PLATED COPPER.
D. CABINETS SHALL BE OF COMMERCIAL GALVANIZED SHEET STEEL, CODE GAUGE AND SIZE, SURFACE OR RECESSED MOUNTED AS CALLED FOR IN THE DRAWINGS.
E. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
F. PANEL SHALL HAVE A COPPER GROUND BAR SIMILAR TO NEUTRAL BAR IN NUMBER, SIZE, AND TYPE OF ANTI-TURN SOLDERLESS LUGS. THIS GROUND BAR SHALL BE FACTORY BONDED TO THE PANEL TUB IN THE GUTTER SPACE OPPOSITE THE MAINS AND THE NEUTRAL ASSEMBLY AND SHALL HAVE THE SCREWDRIVER SLOTS FACING THE FRONT OF THE PANEL.
G. QUALITY STANDARD: SQUARE D TYPE NQOD

ELECTRICAL SYMBOLS

SYMBOL	EXPLANATION	SYMBOL	EXPLANATION	SYMBOL	EXPLANATION
	BRANCH CIRCUIT CONCEALED IN CEILING OR WALL	F1	FIXTURE TYPE SYMBOL		TAMPER AND FLOW
	BRANCH CIRCUIT CONCEALED IN GROUND OR FLOOR		FLUORESCENT FIXTURE (TYPICAL)	FACP	FIRE ALARM CONTROL PANEL
A-1,3	BRANCH CIRCUIT HOMERUNS TO PANEL		EMERGENCY LIGHTING UNIT	RFAA	REMOTE FIRE ALARM ANNUNCIATOR PANEL
135	ROOM NUMBER		SURFACE OR PENDANT MOUNTED FIXTURE	NAC	FIRE ALARM NAC PANEL
CH 1	MECHANICAL EQUIPMENT SYMBOL		RECESSED FIXTURE	VOICE	FIRE ALARM VOICE PANEL
1	KEYED NOTE REFERENCE		WALL MOUNTED FIXTURE	D/H	DOOR HOLDER
42X	FEEDER TAG (SEE FEEDER SCHEDULE)		WALL PACK	F/S	FIRE/SMOKE DAMPER
	LIGHTING AND POWER PANELBOARD		FLUORESCENT STRIP	F	FIRE ALARM PULL STATION
NON-FUSED / FUSED	DISCONNECT SWITCH		TRACK LIGHTING		FIRE ALARM STROBE
NON-FUSED / FUSED	DISCONNECT SWITCH WITH MOTOR STARTER		EMERGENCY LIGHTING UNIT		FIRE ALARM HORN/STROBE
	MOTOR STARTER		WALL MOUNTED EXIT LIGHT (SINGLE FACE)	LF	FIRE ALARM HORN/STROBE (LF = LOW FREQUENCY)
VFD	VARIABLE FREQUENCY DRIVE		WALL MOUNTED EXIT LIGHT (DOUBLE FACE)		FIRE ALARM HORN/STROBE WITH PROTECTIVE COVER
C	CONDUIT STUB		CEILING MOUNTED EXIT LIGHT		FIRE ALARM SPEAKER/STROBE
J	JUNCTION BOX		CEILING MOUNTED EXIT LIGHT (DOUBLE FACE)	LF	FIRE ALARM SPEAKER/STROBE (LF = LOW FREQUENCY)
	ELECTRIC VEHICLE CHARGING STATION		EXIT LIGHT WITH PROTECTIVE COVER		FIRE ALARM SPEAKER
	DUPLEX RECEPTACLE OUTLET	$	SINGLE POLE SWITCH (SUBSCRIPT AS INDICATED BELOW)	LF	FIRE ALARM SPEAKER (LF = LOW FREQUENCY)
WP / A-3 / REF	MODIFIER / PANEL SPACE ASSIGNMENT / EQUIPMENT DESIGNATION	2	TWO POLE SWITCH		FIRE ALARM HORN
		3	3-WAY SWITCH		
WP	WEATHERPROOF COVER & LISTED WEATHER RESISTANT DEVICE	4	4-WAY SWITCH	LF	FIRE ALARM HORN (LF = LOW FREQUENCY)
		D	DIMMER SWITCH		
GFCI	PROTECTED BY FAULT CIRCUIT INTERRUPTER	K	KEYED SWITCH		FIRE ALARM STROBE CEILING MOUNTED
+44	MOUNTING HEIGHT ABOVE FLOOR OR GRADE GIVEN IN INCHES.	T	TIMER SWITCH		
		M	MANUAL STARTER WITH THERMAL OVERLOAD		FIRE ALARM HORN/STROBE CEILING MOUNTED
REF	REFRIGERATOR	F	PADDLE FAN SPEED CONTROL. (CANARM "CN" SERIES)		
DW	DISHWASHER	OC	OCCUPANCY SENSOR SWITCH	LF	FIRE ALARM HORN/STROBE CEILING MOUNTED (LF = LOW FREQUENCY)
DISP	DISPOSAL	LV	LOW VOLTAGE CONTROL SWITCH		
WASH	WASHING MACHINE	LV/D	LOW VOLTAGE CONTROL SWITCH WITH DIMMER		FIRE ALARM HORN CEILING MOUNTED
EWC	ELECTRIC WATER COOLER	OC/D	OCCUPANCY SENSOR CONTROL SWITCH WITH DIMMER		
USB	COOPER TR7746 OR EQUAL DUPLEX PLUS USB CHARGER	OC/2	DUAL RELAY OCCUPANCY SENSOR CONTROL SWITCH	LF	FIRE ALARM HORN CEILING MOUNTED (LF = LOW FREQUENCY)
TR	TAMPER RESISTANT				
	QUAD RECEPTACLE OUTLET	$$	DOUBLE GANG SWITCH		SMOKE DETECTOR (SUBSCRIPT AS INDICATED BELOW)
	SPLIT WIRED DUPLEX RECEPTACLE OUTLET	$a LV, a, a	CONTROL DEVICE WITH SWITCH DESIGNATION (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)	B	SMOKE ALARM BATTERY-BACKED
				C	SMOKE/CARBON MONOXIDE ALARM COMBO BATTERY-BACKED
	220V RECEPTACLE OUTLET	$a,b,c LV	LOW VOLTAGE MULTI BUTTON CONTROL SWITCH (LETTERS INDICATES CONTROL OF CORRESPONDING FIXTURES)	D	DUCT SMOKE DETECTOR
				R	SMOKE DETECTOR WITH ADDRESSABLE RELAY
	ISOLATED GROUND RECEPTACLE	S	OCCUPANCY SENSOR (CEILING MOUNTED)	S	SMOKE DETECTOR WITH SOUNDER BASE
	RECEPTACLE FLOOR DEVICE	S	OCCUPANCY SENSOR (WALL MOUNTED)		HEAT DETECTOR
	CEILING MOUNTED DEVICE	RC	ROOM CONTROLLER		GAS DETECTOR
	SPECIAL RECEPTACLE	LS	DAYLIGHT SENSOR	CO	CARBON MONOXIDE DETECTOR
				CO/NO2	CARBON MONOXIDE/NITROGEN DIOXIDE SENSOR (GARAGE)
	MOTOR OUTLET	P	PHOTOCELL		ADA TWO-WAY COMMUNICATIONS SYSTEM
	EXHAUST FAN	V	VOLUME CONTROL	KP	DOOR ACCESS CONTROL KEY PAD
T	THERMOSTAT OUTLET		WALL SPEAKER	CR	DOOR ACCESS CONTROL CARD READER
S	REMOTE SENSOR OUTLET		CEILING SPEAKER	S DS	DOOR ACCESS CONTROL DOOR STRIKE
	TELEPHONE OUTLET		SURVEILLANCE CAMERA	ML	DOOR ACCESS CONTROL MAG LOCK
▽(#)	COMPUTER DATA OUTLET (#) INDICATES JACK QUANTITIES	DVR	SURVEILLANCE DIGITAL VIDEO RECORDER	DS	DOOR ACCESS CONTROL DOOR SENSOR
	NETWORK AND VOICE OUTLET	NURSE	NURSE CALL ANNUNCIATOR PANEL		DOOR ACCESS CONTROL REQUEST TO EXIT
	WIRELESS ACCESS POINT CEILING MOUNTED	N	NURSE CALL EMERGENCY CALL DEVICE		PUSHBUTTON
TV	TELEVISION OUTLET	N	NURSE CALL EMERGENCY CALL LIGHT	B	BELL

NOTE: ALL SYMBOLS MAY NOT BE USED.

ABBREVIATIONS INDEX

#	NUMBER	DC	DIRECT CURRENT	KW	KILOWATT	PT	POTENTIAL TRANSFORMER
ϕ	PHASE	DISP	DISPOSAL	LRA	LOCKED ROTOR AMPS	PV	PHOTOVOLTAIC
1ϕ	SINGLE PHASE	DRY	DRYER	LTG	LIGHTING	PVC	POLYVINYL CHLORIDE
2P	TWO-POLE	DW	DISHWASHER	MATV	MASTER ANTENNA TELEVISION	(R)	RELOCATE
3ϕ	THREE PHASE	DWG	DRAWING	MAX	MAXIMUM	RECP	RECEPTACLE
4P	FOUR-POLE	EC	EMPTY CONDUIT	MB	MAIN BUS	REF	REFRIGERATOR
AC	ALTERNATING CURRENT	EM	EMERGENCY	MCB	MAIN CIRCUIT BREAKER	REQ	REQUIRED
AFF	ABOVE FINISHED FLOOR	EMG	EMERGENCY GENERATOR	MCC	MOTOR CONTROL CENTER	RLA	RATED LOAD AMPS
AFG	ABOVE FINISHED GRADE	EMT	ELECTRICAL METALLIC TUBING	MCM	1000 CIRCULAR MILLS	RMS	ROOT MEAN SQUARE
AFP	ARC FAULT PROTECTOR	EPO	EMERGENCY POWER OFF	MH	MANHOLE	SE	SERVICE ENTRANCE
AHJ	AUTHORITY HAVING JURISDICTION	EWC	ELECTRIC WATER COOLER	MIC	MICROPHONE	SPD	SURGE PROTECTION DEVICE
AIC	AMP INTERRUPTING CURRENT (SYMMETRICAL)	EWH	ELECTRIC WATER HEATER	MIN	MINIMUM	SPEC	SPECIFICATION
AL	ALUMINUM	(E)	EXISTING	MLO	MAIN LUGS ONLY	SPK	SPEAKER
AM	AMPS METER	(F)	FUTURE	MNF	MANUFACTURER	SS	SELECTOR SWITCH
AMP	AMPERE	FA	FIRE ALARM	MTG	MOUNTING	SW	SWITCH
ANN	ANNUNCIATOR	FACP	FIRE ALARM CONTROL PANEL	MTR	MOTOR	SWBD	SWITCHBOARD
ATS	AUTOMATIC TRANSFER SWITCH	FC	FOOT CANDLE	MW	MICROWAVE	SWGR	SWITCHGEAR
AUX	AUXILIARY	FLA	FULL LOAD AMPS	(N)	NEW	TTB	TELEPHONE TERMINAL BOARD
AWG	AMERICAN WIRE GAUGE	FT	FOOT	N/A	NOT APPLICABLE	TBC	TELEPHONE TERMINAL CABINET
BC	BARE COPPER	FRZ	FREEZER	NC	NORMALLY CLOSED	TV	TELEVISION
BFG	BELOW FINISH GRADE	FS	FUSED SWITCH	NEC	NATIONAL ELECTRICAL CODE	TYP	TYPICAL
C	CONDUIT	GFAF	DUAL FUNCTION GFCI/AFCI CIRCUIT BREAKER	NEMA	NATIONAL MANUFACTURING ASSOCIATION	UG	UNDERGROUND
CAB	CABINET	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NFC	NATIONAL FIRE CODE	UNO	UNLESS NOTED OTHERWISE
CATB	COMMUNITY ANTENNA TELEVISION	GFEP	GROUND-FAULT EQUIPMENT PROTECTION	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION	UPS	UNINTERRUPTIBLE POWER SUPPLY
CATV	CABLE TELEVISION	GFP	GROUND FAULT PROTECTOR	NFS	NON FUSED SWITCH	V	VOLT (KV-KILOVOLT)
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GRC	GALVANIZED RIGID CONDUIT	NIC	NOT IN CONTRACT	VA/R	VOLT-AMPS/REACTIVE
CKT	CIRCUIT	GRD	GROUND	NL	NIGHT LIGHT	VM	VOLT METER
CLG	CEILING	HP	HORSE POWER	NO	NORMALLY OPEN	W	WATTS
CNTR	CONTRACTOR	HZ	HERTZ	NTS	NOT TO SCALE	W/	WITH
CO	CONVENIENCE OUTLET	IG	ISOLATED GROUND	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED	WASH	WASHER
CRT	COMPUTER TERMINAL	IMC	INTERMEDIATE METALLIC CONDUIT	OFOI	OWNER FURNISHED OWNER INSTALLED	WH	WATTHOUR
CT	CURRENT TRANSFORMER	IN	INCH	OS&Y	OUTSIDE SCREW AND YOKE	W/O	WITHOUT
CU	COPPER	J-BOX	JUNCTION BOX	PB	PUSH BUTTON	WP	WEATHER PROOF
C/W	CONDUIT WITH	KV	KILOVOLT	PF	POWER FACTOR	XFMR	TRANSFORMER
(D)	DEMOLISH/DELETE	KVA	KILOVOLT AMPERES	PFR	PHASE FAILURE RELAY	XFMR-SW	TRANSFORMER SWITCH
DB	DECIBEL	KVAR	KILOVARS	PNL	PANEL	XP	EXPLOSION PROOF

NOTE: THIS IS A TYPICAL ABBREVIATION LIST. NOT ALL ABBREVIATIONS MAY BE USED ON THIS PROJECT.

Sheet List Table

SHEET NUMBER	SHEET TITLE
E010	ELECTRICAL COVER SHEET
E101	SITE ELECTRICAL PLAN
E501	ELECTRICAL DETAILS

ELECTRICAL GENERAL NOTES:

1. REVIEW AND COORDINATE WITH ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, PLUMBING, CXT MANUFACTURED BUILDING, AND OTHER DRAWINGS PRIOR TO BID.
2. REVIEW ALL ARCHITECT'S ELEVATIONS, SECTIONS, AND FLOOR PLANS PRIOR TO ROUGH-IN OF ELECTRICAL JUNCTION BOXES.
3. VERIFY EXACT LOCATION(S) OF ALL EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.
4. PERFORM ALL WORK IN A WORKMANLIKE MANNER, PER INDUSTRY STANDARD, AND TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER. WORK, MATERIALS, AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES, STANDARDS AND ORDINANCES.
5. FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE AS PER MANUFACTURERS WRITTEN INSTRUCTIONS AND APPROVED WIRING DIAGRAMS AND DETAILS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENTS, ETC,) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS PRIOR TO BEGINNING ROUGH-IN.
6. USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTED.
7. PROVIDE BLANK COVER PLATES TO MATCH THE OTHER COVER PLATES FOR ALL JUNCTION BOXES WHERE DEVICES HAVE NOT BEEN INSTALLED AT THE COMPLETION OF WORK.
8. ALL MATERIALS USED IN THIS INSTALLATION SHALL BE U.L. APPROVED AND NEW.
9. TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
10. VISIT THE PROJECT SITE DURING THE BIDDING PROCESS TO DETERMINE THE TOTAL SCOPE OF THE PROJECT.
11. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOF, ETC.

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KYLE L. BREINHOLT
3 May 2022
STATE OF UTAH

KYLE BREINHOLT
LIC.: 9857303
EXP.: 31 MARCH 2023

BREINHOLT
POWER ENGINEERING, PLLC
805 SOUTH 1430 WEST, LEHI UT 84043
(801) 367-5180 PROJECT: BPE22C2

ADAM'S CANYON TRAILHEAD IMPROVEMENTS
450 NORTH EASTSIDE DRIVE LAYTON UTAH

PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

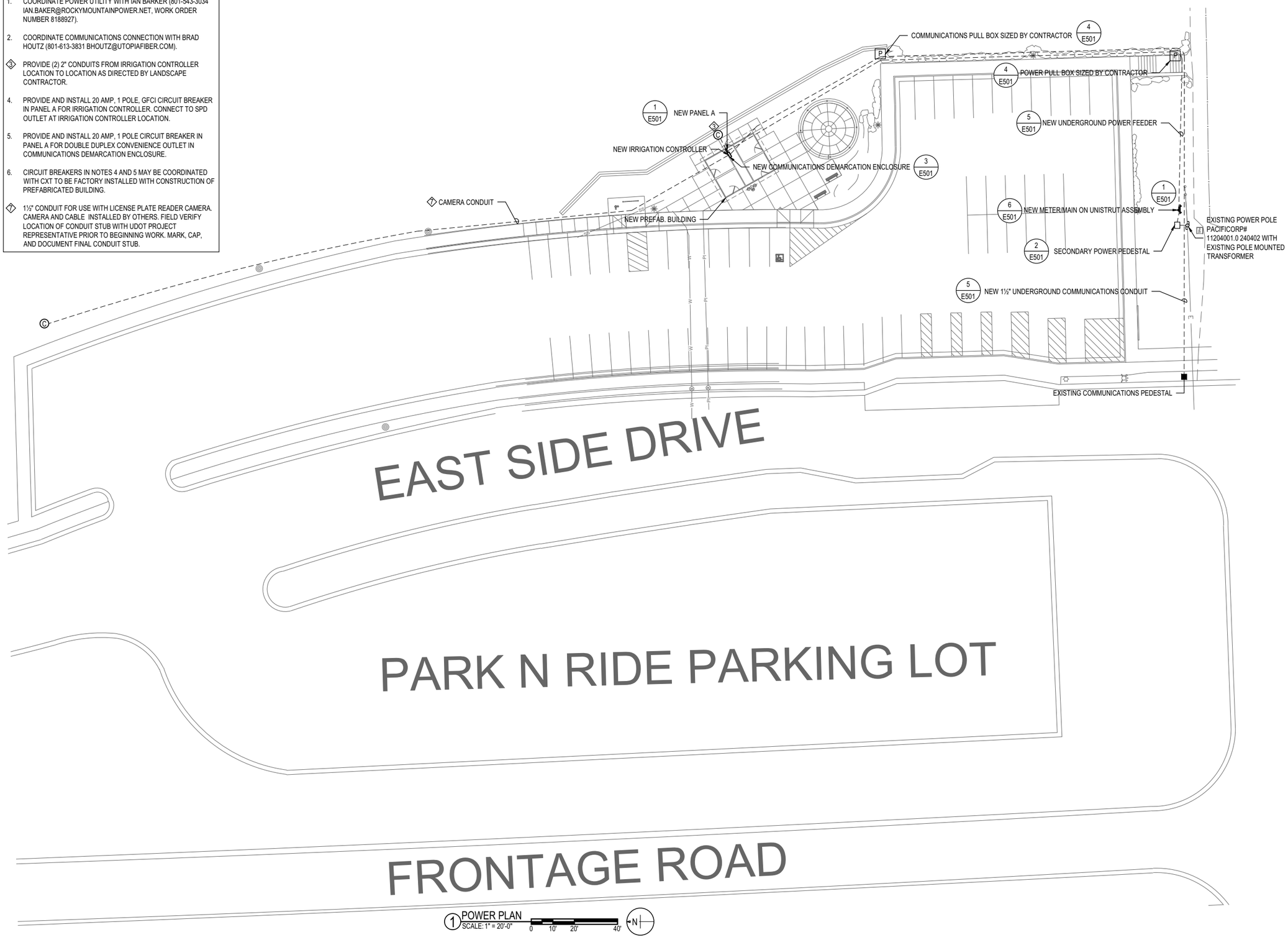
08 APRIL 2022 - PERMIT & BID

SHEET TITLE:
ELECTRICAL COVER SHEET

SHEET NUMBER:
E010
ELECTRICAL

NOTES:

1. COORDINATE POWER UTILITY WITH IAN BARKER (801-543-3034 IAN.BAKER@ROCKYMOUNTAINPOWER.NET, WORK ORDER NUMBER 8188927).
2. COORDINATE COMMUNICATIONS CONNECTION WITH BRAD HOUTZ (801-613-3831 BHOUTZ@UTOPIAFIBER.COM).
3. PROVIDE (2) 2" CONDUITS FROM IRRIGATION CONTROLLER LOCATION TO LOCATION AS DIRECTED BY LANDSCAPE CONTRACTOR.
4. PROVIDE AND INSTALL 20 AMP, 1 POLE, GFCI CIRCUIT BREAKER IN PANEL A FOR IRRIGATION CONTROLLER. CONNECT TO SPD OUTLET AT IRRIGATION CONTROLLER LOCATION.
5. PROVIDE AND INSTALL 20 AMP, 1 POLE CIRCUIT BREAKER IN PANEL A FOR DOUBLE DUPLEX CONVENIENCE OUTLET IN COMMUNICATIONS DEMARCATION ENCLOSURE.
6. CIRCUIT BREAKERS IN NOTES 4 AND 5 MAY BE COORDINATED WITH CXT TO BE FACTORY INSTALLED WITH CONSTRUCTION OF PREFABRICATED BUILDING.
7. 1½" CONDUIT FOR USE WITH LICENSE PLATE READER CAMERA. CAMERA AND CABLE INSTALLED BY OTHERS. FIELD VERIFY LOCATION OF CONDUIT STUB WITH UDOT PROJECT REPRESENTATIVE PRIOR TO BEGINNING WORK. MARK, CAP, AND DOCUMENT FINAL CONDUIT STUB.



1 POWER PLAN
SCALE: 1" = 20'-0"
0 10' 20' 40'
N

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450 NORTH EASTSIDE DRIVE LAYTON UTAH

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DATE: 02 MAY 2022
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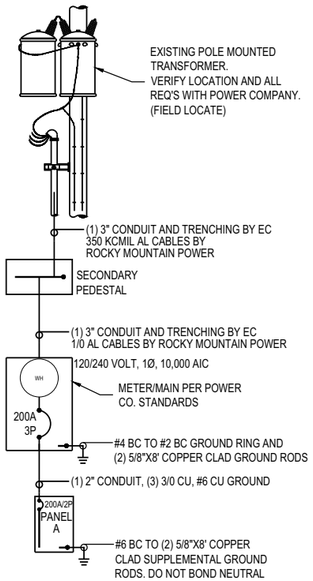
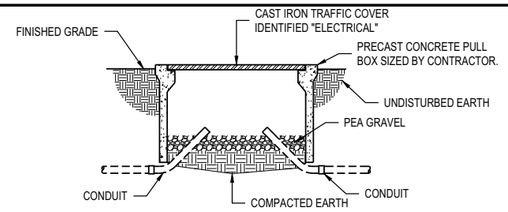
08 APRIL 2022 - PERMIT & BID

SHEET TITLE:
SITE ELECTRICAL PLAN
SHEET NUMBER:
E101
ELECTRICAL



⑦ POWER ONE-LINE DIAGRAM



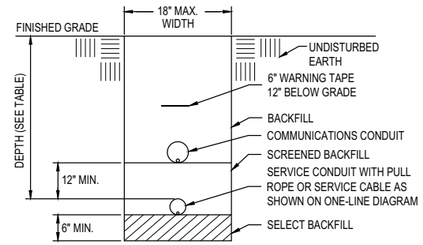
SECTION VIEW

④ ELECTRICAL PULL BOX DETAIL

SCALE: NTS

LOCATION DESCRIPTION	MIN. DEPTH
BELOW CONCRETE SLAB (NOT TRAFFIC)	18 INCHES
BELOW TRAFFIC SURFACES	24 INCHES
PARKING LOT (PAVED OR NON-PAVED)	24 INCHES
OTHER LOCATIONS	24 INCHES
UTILITY SECONDARY	24 INCHES*
UTILITY PRIMARY	48 INCHES*

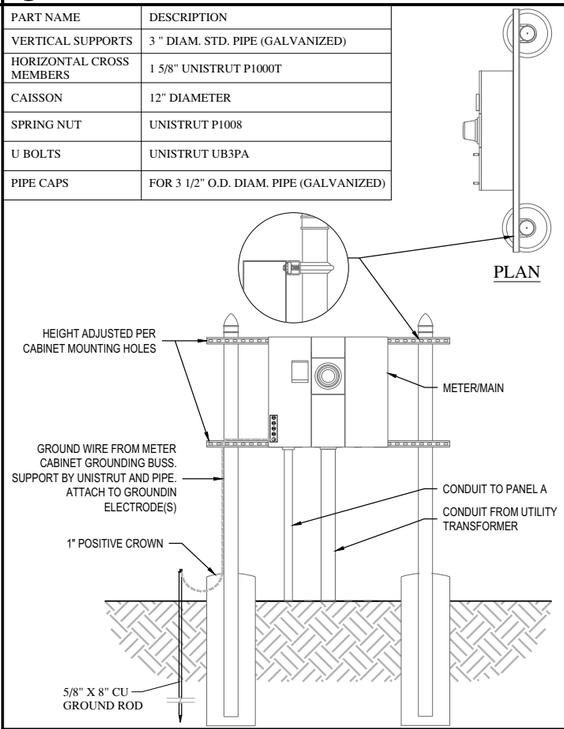
(SEE NEC TABLE 300.5)
* VERIFY ALL DIMENSIONS WITH LOCAL POWER COMPANY STANDARDS AND SPECIFICATIONS.



⑤ TRENCHING DETAIL

SCALE: NTS

PART NAME	DESCRIPTION
VERTICAL SUPPORTS	3 " DIAM. STD. PIPE (GALVANIZED)
HORIZONTAL CROSS MEMBERS	1 5/8" UNISTRUT P1000T
CAISSON	12" DIAMETER
SPRING NUT	UNISTRUT P1008
U BOLTS	UNISTRUT UB3PA
PIPE CAPS	FOR 3 1/2" O.D. DIAM. PIPE (GALVANIZED)

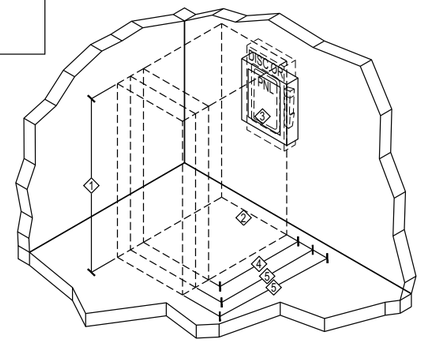


⑥ METER/MAIN UNISTRUT ASSEMBLY DETAIL

SCALE: NTS

NOTES:

1. THE MINIMUM HEADROOM OF WORKING SPACE SHALL BE 6½ FT.
2. THE WIDTH OF THE WORKING SPACE SHALL BE THE WIDTH OF THE EQUIPMENT OR 30 IN., WHICHEVER IS GREATER. THE PANEL DOOR SHALL OPEN AT LEAST 90 DEGREES.
3. ALL CIRCUIT BREAKERS OR DISCONNECT HANDLES SHALL BE NOT MORE THAN 6 FT 7 IN. ABOVE THE FLOOR WHEN IN THEIR HIGHEST POSITION.
4. 3 FT CLEARANCE IF 0-150V TO GROUND.
5. 3.5FT CLEARANCE IF 151-600V TO GROUND. 4FT IF EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE.
6. ALL WORKING SPACE CLEARANCE MEASURED FROM FACE OF PANEL FOR DEPTH, LEFT OR RIGHT EDGE FOR WIDTH, AND STANDING SURFACE FOR HEADROOM.
7. REFERENCE NEC 110.26 FOR WORKSPACE CLEARANCES.



① WORK SPACE CLEARANCES

Policy 242—Underground Conduit Systems for Primary and Secondary Conductors

9.4. Conduit Placement

The conduit is installed as shown in "Figure 74" below. Note that the number of conduits may vary depending on the infrastructure design.

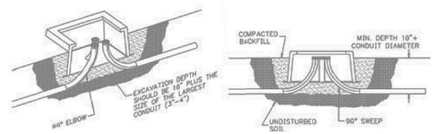


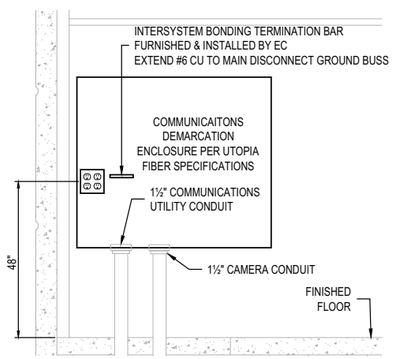
Figure 74—Top View/Side View – Secondary Box

Notes

1. For each conduit run: 2' of trench left open
2. 90 degree elbow permanently attached to each conduit run.

② SECONDARY PEDESTAL

SCALE: SCHEMATIC



③ PHONE BOARD DETAIL

SCALE: NTS

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PROJECT NO. 21145
DATE: 02 MAY 2022
REVISIONS:

08 APRIL 2022 - PERMIT & BID

SHEET TITLE:
ELECTRICAL DETAILS

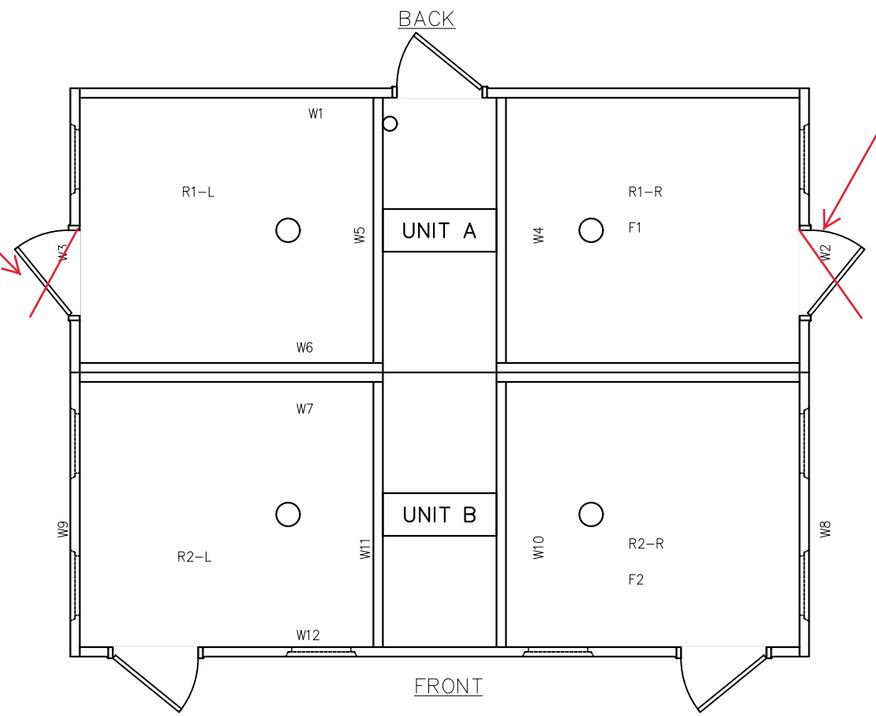
SHEET NUMBER:
E501
ELECTRICAL

ARAPAHOE

PANEL MARK NO. KEY PLAN

Door swings from opposite hinge (see page 3 of pdf)

Door swings from opposite hinge (see page 3 of pdf)



NOTES

1. BUILDING IS DESIGNED TO COMPLY WITH THE 2018 INTERNATIONAL BUILDING CODE (IBC).
2. DESIGN COMPLIES WITH THE PROVISIONS OF THE 2018 IBC FOR THE FOLLOWING LOADS:
   GROUND SNOW LOAD = 250 PSF
   FLOOR LIVE LOAD = 400 PSF
   IBC DESIGN SPECTRAL RESPONSE S_s = 1.684, S_1 = 0.661
   SITE CLASS D
   RISK CATEGORY: II
   SEISMIC DESIGN CATEGORY: D
   BEARING WALL SYSTEM R = 4.0
   BASIC WIND SPEED = 150 MPH (3–SECOND GUST)
   WIND EXPOSURE C
3. CONSTRUCTION TYPE: V–B
   OCCUPANCY: U
   EXTERIOR WALLS: 1–HR RATED PER IBC TABLE 721.1(2), ITEM 4–1.1
   MINIMUM FIRE SEPARATION DISTANCE: 10 FEET
4. CONCRETE STRENGTH f'ci = 2500 PSI INITIAL f'c = 5000 PSI FINAL AIR ENTRAINMENT 6% ± 1 1/2% IN PLASTIC CONCRETE. REINFORCING STEEL: ASTM A615 #3 GRADE 40, #4 AND LARGER GRADE 60 Fy = 60 KSI MINIMUM LAP 18" AT SPLICES. TIE BARS WITH DOUBLE ANNEALED 16 GA IRON WIRE. REINFORCING TO BE PLACED IN CENTER OF PANEL UNO. WELDED WIRE FABRIC(W.W.F.): ASTM A1064 GRADE 80 4x4xW6.7xW6.7, Fy=80 KSI (OR EQUIVAL), SMOOTH WIRE, MIN. LAP 2 SQUARES.
5. EMBEDDED ITEMS IDENTIFIED ON DRAWINGS (i.e. PS–2, R301) REFER TO CXT STANDARD EMBEDMENT CATALOG.
6. BACK OF PANELS TO HAVE SMOOTH TROWEL FINISH UNO. ALL SURFACES TO BE TEXTURED ARE NOTED ON PANEL DWG'S
7. REFER TO SEPARATE CXT INCORPORATED SPECIFICATIONS COVERING DESIGN, MATERIALS, PRODUCTION, AND INSTALLATION CRITERIA FOR SPECIFIC STYLE OF BUILDING.
8. ALL REBAR BENDS ARE TO HAVE A MINIMUM RADIUS OF 6x THE BAR DIAMETER.
9. INSTALLATION TO MEET APPLICABLE LOCAL, STATE & FEDERAL CODES, BY OTHERS.
10. ADEQUATE PLUMBING FACILITIES TO BE PROVIDED IN ACCORDANCE WITH 2018 IBC SECTION 2902.3.2 (NOT BY CXT).
11. MINIMUM SOIL BEARING PRESSURE 1500 PSF.

INDEX OF DRAWINGS

APPLICABLE CODES

2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL PLUMBING CODE
2020 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL ENERGY CONSERVATION CODE
2009 ICC A117.1

SPECIAL CONDITIONS AND/OR LIMITATIONS

ACCESSIBILITY TO THIS BUILDING, INCLUDING PARKING IS TO BE PROVIDED BY OTHER AND CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL BUILDING CODES.

CASTING TOLERANCES:

OVERALL LENGTH OR WIDTH
10 FT OR UNDER = ± 1/8"
10 TO 20 FT = +1/8", -3/16"
20 TO 40 FT = ±1/4"

TOTAL THICKNESS = –1/8, +1/4

VARIATION FROM SQUARE = ±1/8 PER 6 FT OF DIAGONAL

LOCAL SMOOTHNESS = 1/4" IN 10 FT

SWEEP = ±1/4"

POSITION OF TENDONS = ±1/4"

POSITION OF BLOCKOUTS = ±1/4"

SIZE OF BLOCKOUTS = ±1/4"

POSITION OF EMBEDS = ±1/4"

TIPPING AND FLUSHNESS OF PLATES = +1/16, –1/4

BOWING = LENGTH/360

END SQUARENESS = ±1/8"

UTAH STATE PE DRAWINGS (ECC ONLY) REQUIRED

WALL TEXTURE:	BARNWOOD
WALL COLOR:	MOCHA CARMEL
ROOF TEXTURE:	CEDAR SHAKE
ROOF COLOR:	JAVA BROWN
TRIM PAINT:	DTM ALKYD ENAMEL BROWN
SEALER:	2K ANTI–GRAFFITI
PACKAGE:	STANDARD

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362 Waverly Road Williamstown, WV 26187

PROJECT TITLE
ARAPAHOE
BUILDING NUMBER A–082

REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04–25–22

SCALE	N/A	DATE	03–30–22
DRAWN	MICHAEL M	FILE NO.	A–083
CHECKED	MCT	PLOT	N/A

COVER SHEET

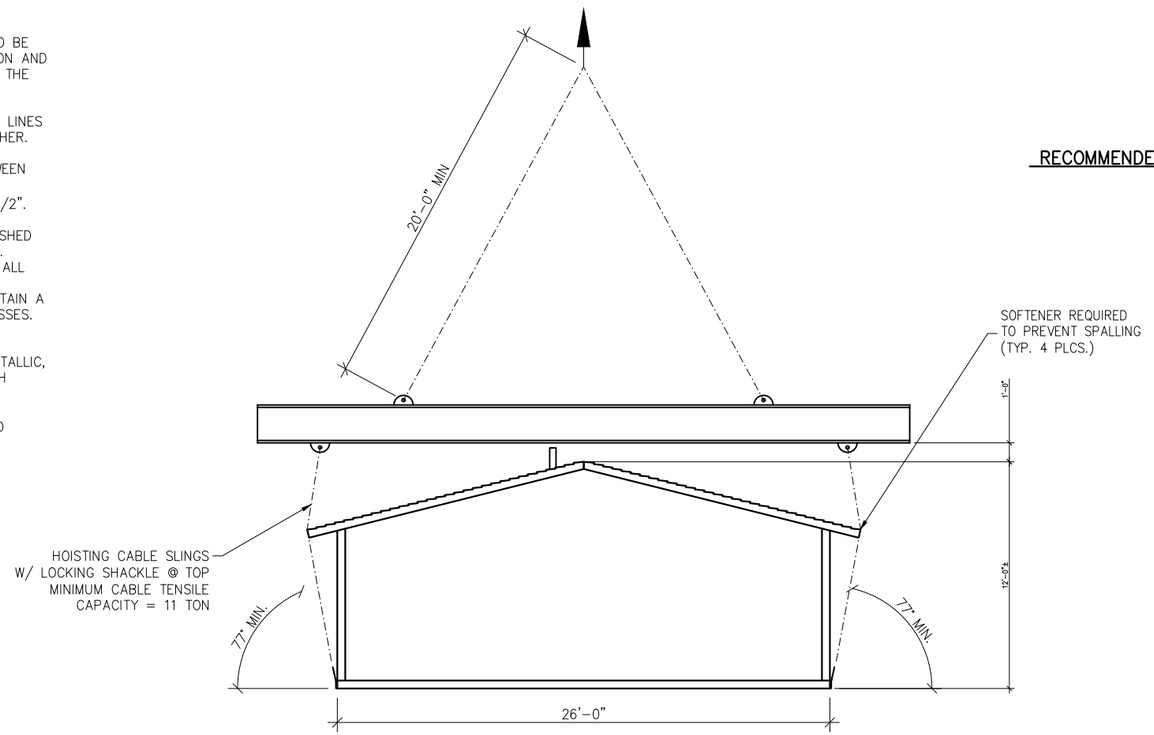
DWG NO.	SHEET	REV.
A–01	1 / 33	1

ARAPAHOE

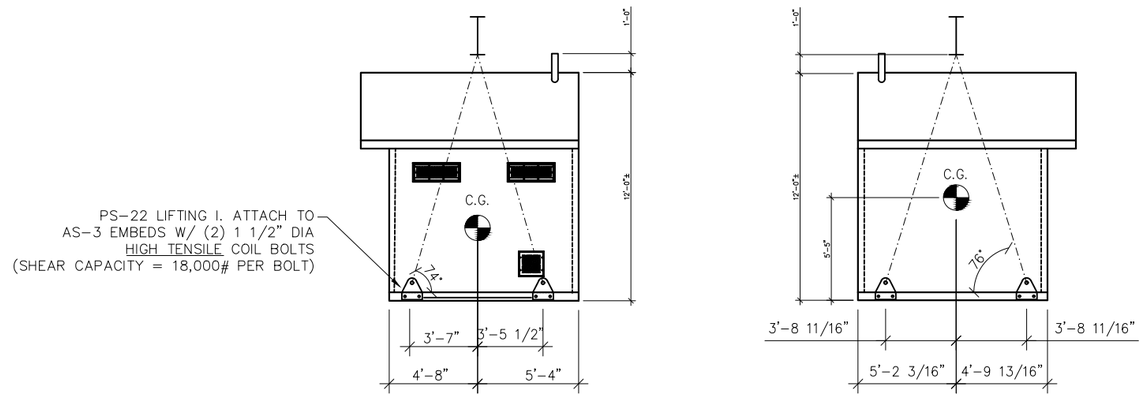
RECOMMENDED HANDLING AND INSTALLATION INSTRUCTIONS

NOTES:

1. THE ARAPAHOE STYLE BUILDING CONSISTS OF TWO SEPARATE UNITS TO BE PLACED AND JOINED AT THE PROJECT SITE. PROPER SITE PREPARATION AND HANDLING IS ESSENTIAL FOR THE SAFE AND PROPER INSTALLATION OF THE BUILDING.
2. PROVIDE SHALLOW TRENCH WITH ROLLED EDGES ALONG BUILDING JOINT LINES TO PREVENT TRAPPING MATERIAL BETWEEN UNITS BEING DRAWN TOGETHER.
3. PLACE UNITS AS CLOSE TO ONE ANOTHER AS POSSIBLE. SPACE BETWEEN UNITS SHOULD NOT EXCEED 1" AT INITIATION OF POST-TENSIONING. MAXIMUM ALLOWABLE FINISH JOINT SPACE BETWEEN UNITS SHALL BE 1/2".
4. POST-TENSIONING TO DRAW UNITS INTO CONTACT SHALL BE ACCOMPLISHED WITH EQUIPMENT PROVIDED BY CXT BY PROPERLY TRAINED PERSONNEL. INSTRUCTIONS PROVIDED BY CXT SHALL BE CAREFULLY ADHERED TO. ALL NECESSARY SAFETY PRECAUTIONS SHALL BE TAKEN BY INSTALLATION PERSONNEL. STRESS TENDONS TO DRAW UNITS TOGETHER AND TO RETAIN A MINIMUM EFFECTIVE FORCE IN EACH TENDON OF 2 KIPS AFTER ALL LOSSES.
5. AFTER COMPLETION OF BUILDING PLACEMENT, BLOCKOUTS AT POST-TENSIONING ANCHORAGE POINTS SHALL BE FILLED WITH NON-METALLIC, NON-SHRINK GROUT. PROVIDE SMOOTH, NEAT FINISH COMPATIBLE WITH SURROUNDING CONCRETE SURFACES. MATCH CONCRETE COLOR.
6. PROVIDE UTILITY CONNECTIONS (PLUMBING & ELECTRICAL) AS REQUIRED AND/OR AS CALLED FOR ON THE DRAWINGS.
7. FILL FLOOR BLOCKOUTS AFTER COMPLETION OF UTILITY HOOKUPS WITH CONCRETE. SLOPE TO DRAIN.



CRANE LIFTING SCHEMATIC – SIDE VIEW

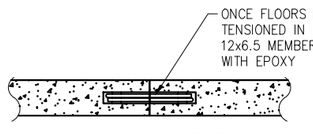


CRANE LIFTING SCHEMATIC – END VIEW

NOTES:
1. C.G. IS APPROXIMATE.
2. WEIGHT IS APPROXIMATE.

SHIPPING WEIGHTS AND DIMENSIONS				
SECTION	WEIGHT	LENGTH	WIDTH	HEIGHT
A (BACK)	74,100	29'-0"	11'-6"	12'-0"
B (FRONT)	75,400	29'-0"	11'-6"	12'-0"

FIELD SECTIONAL CONNECTION DETAIL



ELEVATION
VIEW
FINAL VIEW

EMBEDDED MATERIALS	
ITEM	QTY
P.T. CABLE 26'-0"	4
CHUCKS & WEDGES	8
GROUT	4 BAGS
REBAR R4 12"x6.5"	4
HIT-HY-200-A EPOXY	2

CU. FT. CONC.	SQ. FT. W.W.F.

APPROXIMATE WEIGHT

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PROJECT TITLE
ARAPAHOE
BUILDING NUMBER A-082

REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

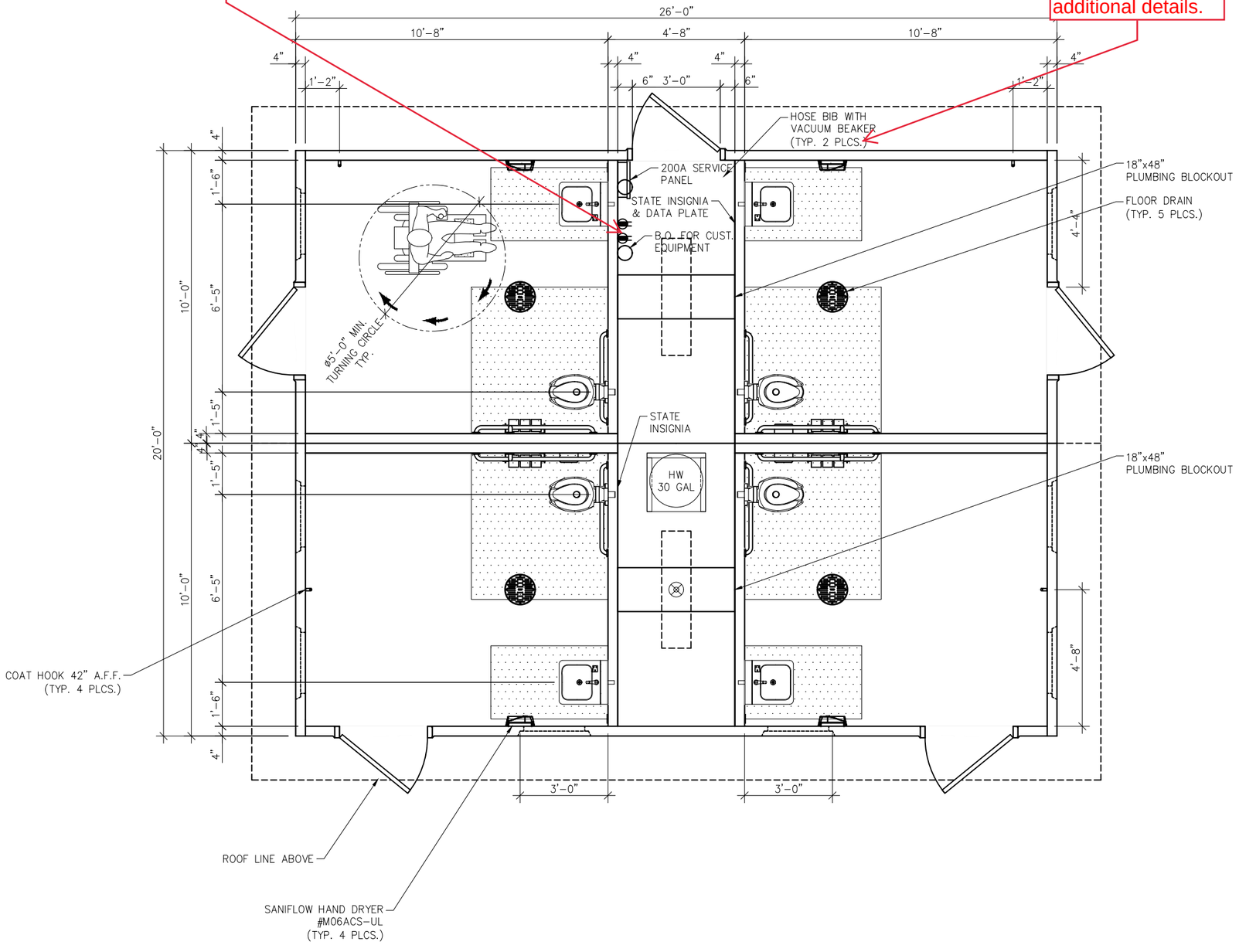
SCALE	N/A	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	N/A

HANDLING INSTRUCTIONS

DWG NO.	SHEET	REV.
A-02	2 / 33	1

Label these two duplex outlets

Have them refer to page 8 for locations and additional details.



NOTES:
1. SEE DRAWING A-27 FOR SIZE AND LOCATION OF FLOOR BLOCKOUTS

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BUILDING NUMBER A-082

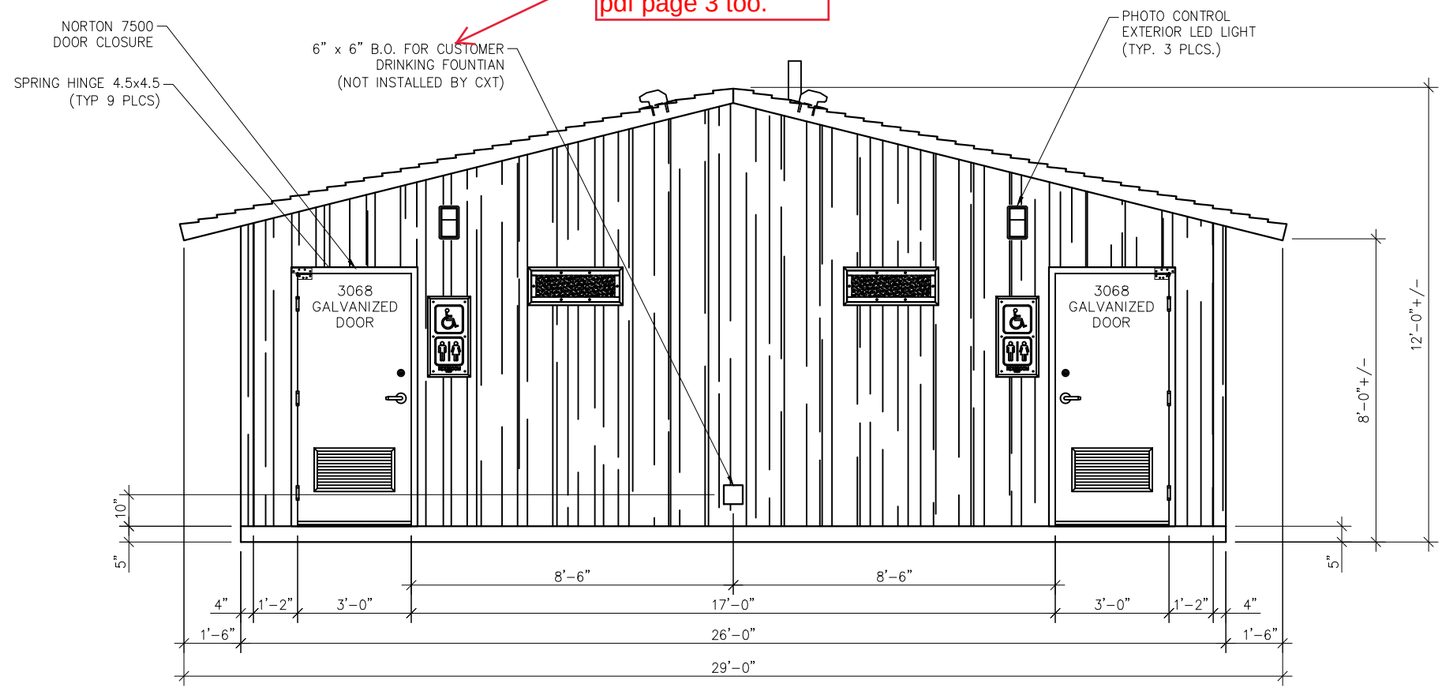
REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

SCALE	3/8"=1'-0"	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	32

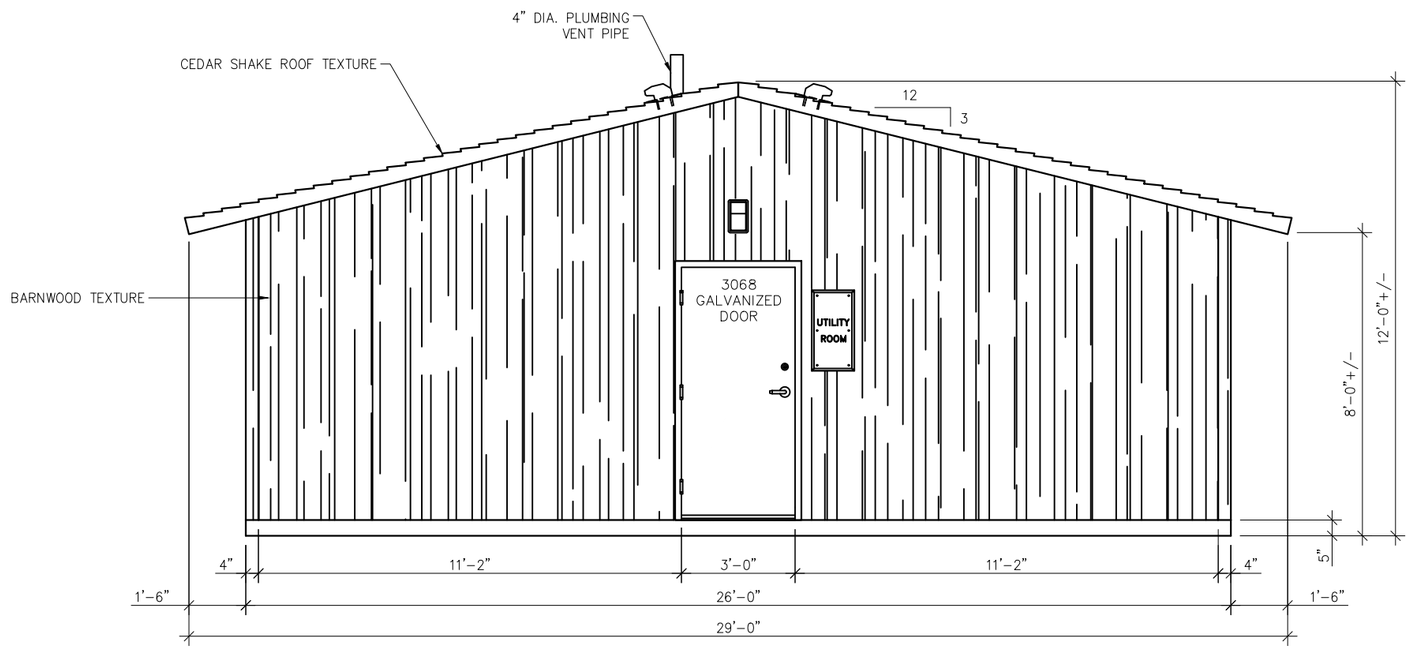
FLOOR PLAN

DWG NO.	SHEET	REV.
A-03	3 / 33	1

Include this note on pdf page 3 too.



FRONT ELEVATION



REAR ELEVATION

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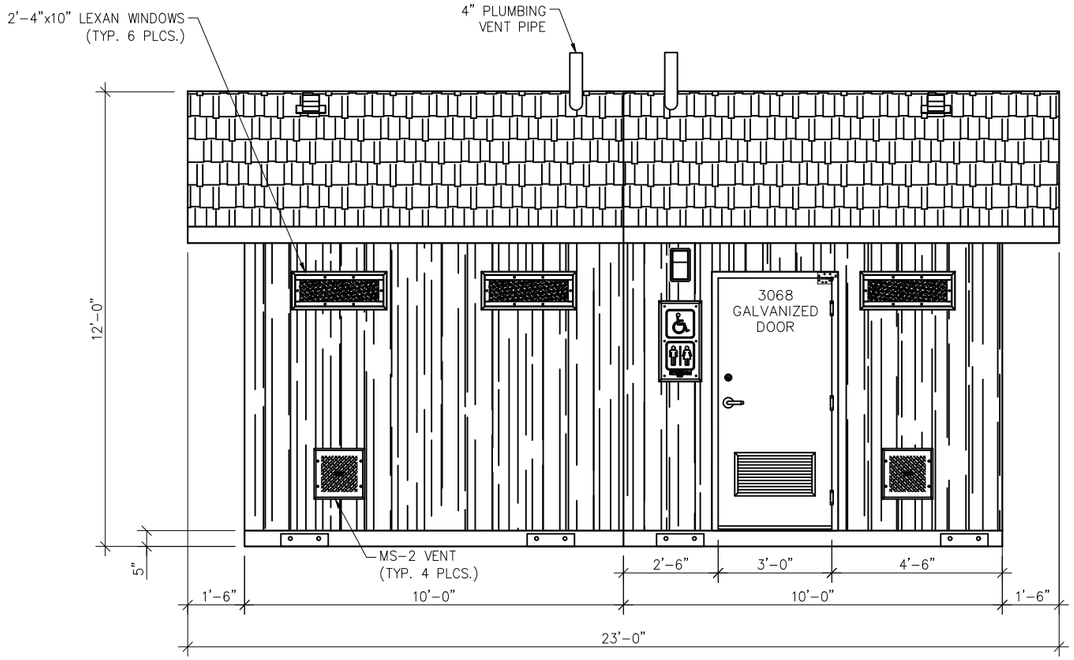
REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

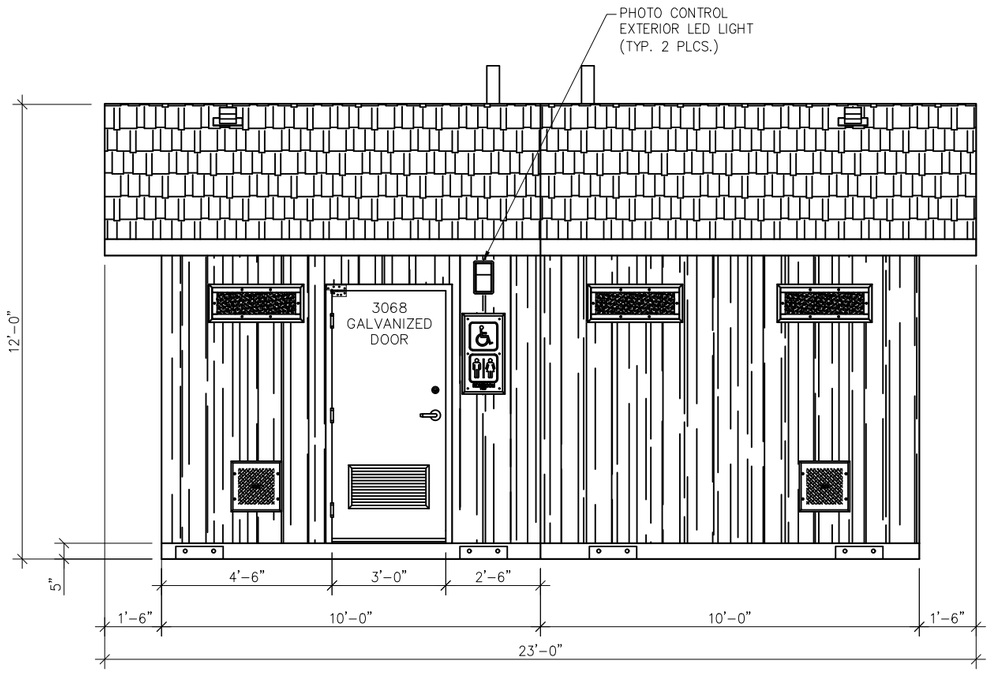
SCALE	1/4"=1'-0"	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	48

BUILDING ELEVATIONS

DWG NO.	SHEET	REV.
A-04	4 / 33	1



RH SIDE ELEVATION



LH SIDE ELEVATION

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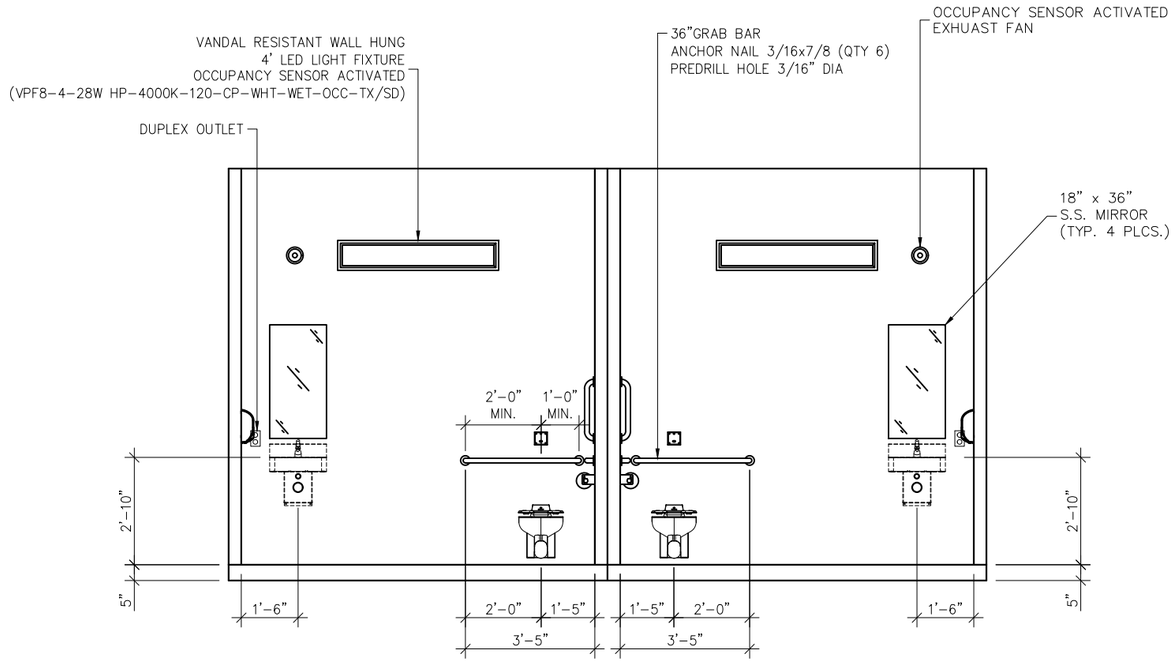
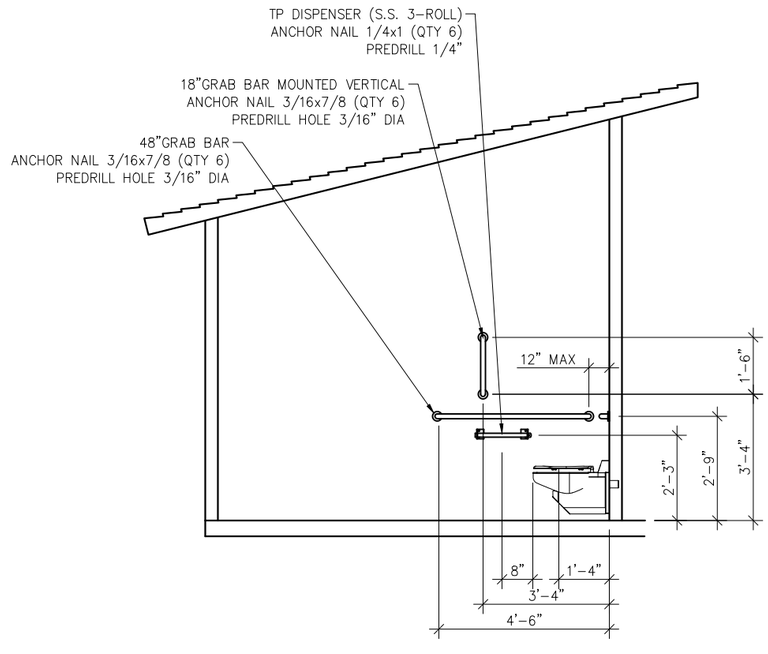
REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

SCALE	1/4"=1'-0"	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	48

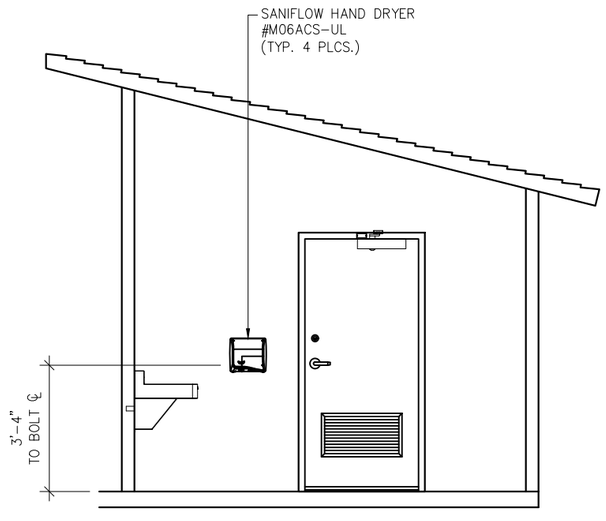
INTERIOR
ELEVATIONS

DWG NO.	SHEET	REV.
A-05	5 / 33	1





INTERIOR ELEVATION



INTERIOR ELEVATION

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PROJECT TITLE
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BUILDING NUMBER A-082

REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

SCALE	1"=1'-0"	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	12

FINISH
DETAILS

DWG NO.	SHEET	REV.
A-06	6 / 33	1

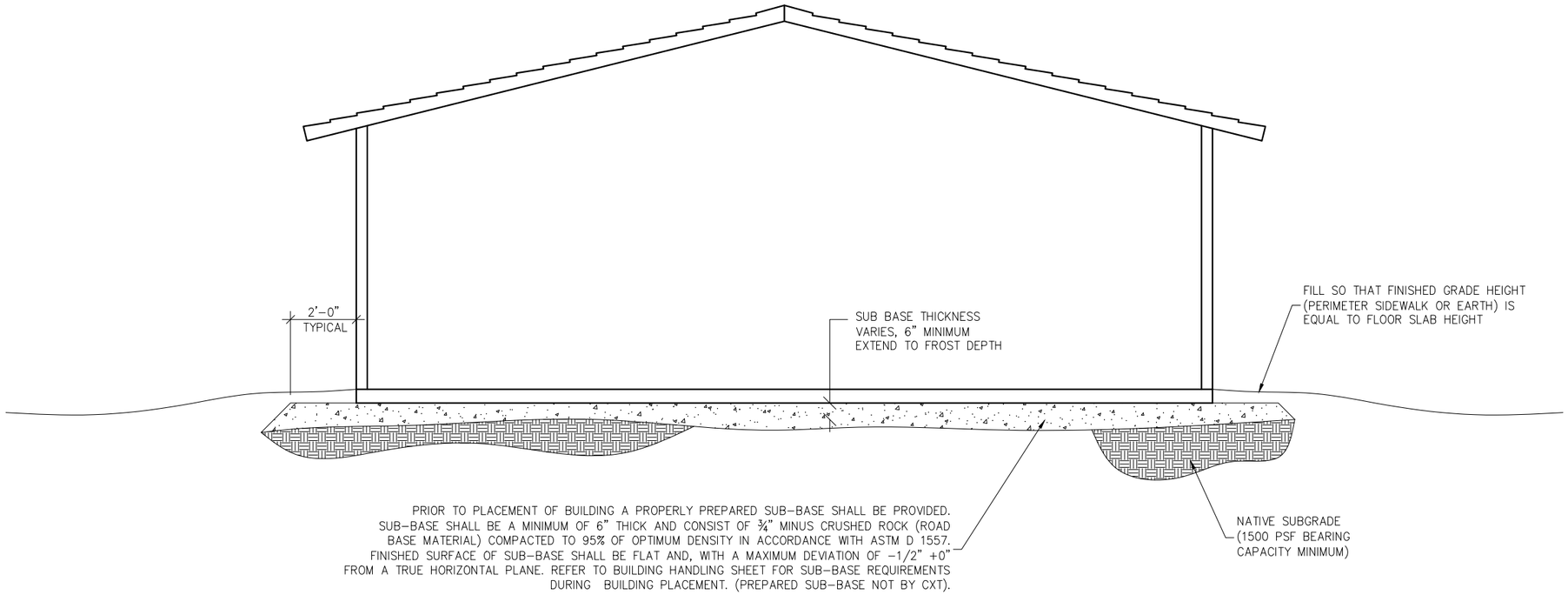
NOTE:

THIS FACTORY ASSEMBLED BUILDING, AS CONSTRUCTED, PROVIDES A RIGID BOX TYPE STRUCTURAL SYSTEM. VERTICAL LOADS ARE TRANSFERRED PRIMARILY THROUGH BEARING WALLS TO THE STRUCTURAL SLAB FLOOR OF THE BUILDING. THE VERTICAL LOADS ARE THEN DISTRIBUTED THROUGH THE REINFORCED CONCRETE FLOOR TO THE PREPARED GRANULAR, NON–FROST SUSCEPTIBLE (NFS) SUB–BASE WHICH DISTRIBUTES THE VERTICAL LOADS IN RELATIVELY UNIFORM FASHION TO THE NATIVE SUB–GRADE. AS WITH MOST CONSTRUCTION, THIS DOES REQUIRE THE NATIVE SUB–GRADE TO BE STRIPPED OF VEGETATION AND TOP SOIL PRIOR TO PLACEMENT OF THE PREPARED GRANULAR SUB–BASE. DUE TO THE INHERENT STIFFNESS OF THE BUILDING, IT WILL REMAIN SAFE AND STRUCTURALLY SOUND IN THE UNLIKELY EVENT OF FREEZING ACTION BELOW THE BUILDING REGARDLESS OF NATURAL FREEZE/ THAW CYCLES ANTICIPATED TO BE ENCOUNTERED IN THE STATE OF UTAH.

LATERAL LOADS ARE TRANSFERRED TO THE GROUND THROUGH FRICTIONAL RESISTANCE WITHOUT SLIDING OR SHIFTING BETWEEN THE BUILDING FLOOR SLAB AND THE PREPARED SOIL AND GRAVEL SUB–BASE ON WHICH THE BUILDING RESTS. SEISMIC ANALYSES ARE BASED ON LOADS DETERMINED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE USING PARAMETERS, WHICH MEET OR EXCEED THE CODE PRESCRIBED REQUIREMENTS FOR THIS INSTALLATION.

THIS BUILDING AS DESIGNED, RESTING ON A PROPERLY PREPARED GRANULAR SUB–BASE WILL BE SAFE AND STRUCTURALLY SOUND FOR VERTICAL AND LATERAL LOADS AS DISCUSSED ABOVE. A FULL DEPTH FOUNDATION WALL AT THE BUILDING PERIMETER AND AN ANCHORAGE SYSTEM, TYPICAL FOR OTHER TYPES OF BUILDING CONSTRUCTION, ARE NOT REQUIRED FOR THIS BUILDING.

THE "FOUNDATION" FOR THIS STRUCTURE IS ESSENTIALLY THE COMBINATION OF THE COMPACTED SUB–BASE MATERIAL AND THE BUILDING'S REINFORCED SLAB. THE COMBINATION OF THE COMPACTED SUB–BASE MATERIAL AND THE BUILDING'S REINFORCED SLAB NEED TO BE AT LEAST 12" THICK AND THE COMPACTED SUB–BASE MATERIAL SHALL EXTEND BELOW THE LOCAL FROST DEPTH



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1	APPLY CUSTOMER COMMENTS	MICHAEL M	04–25–22

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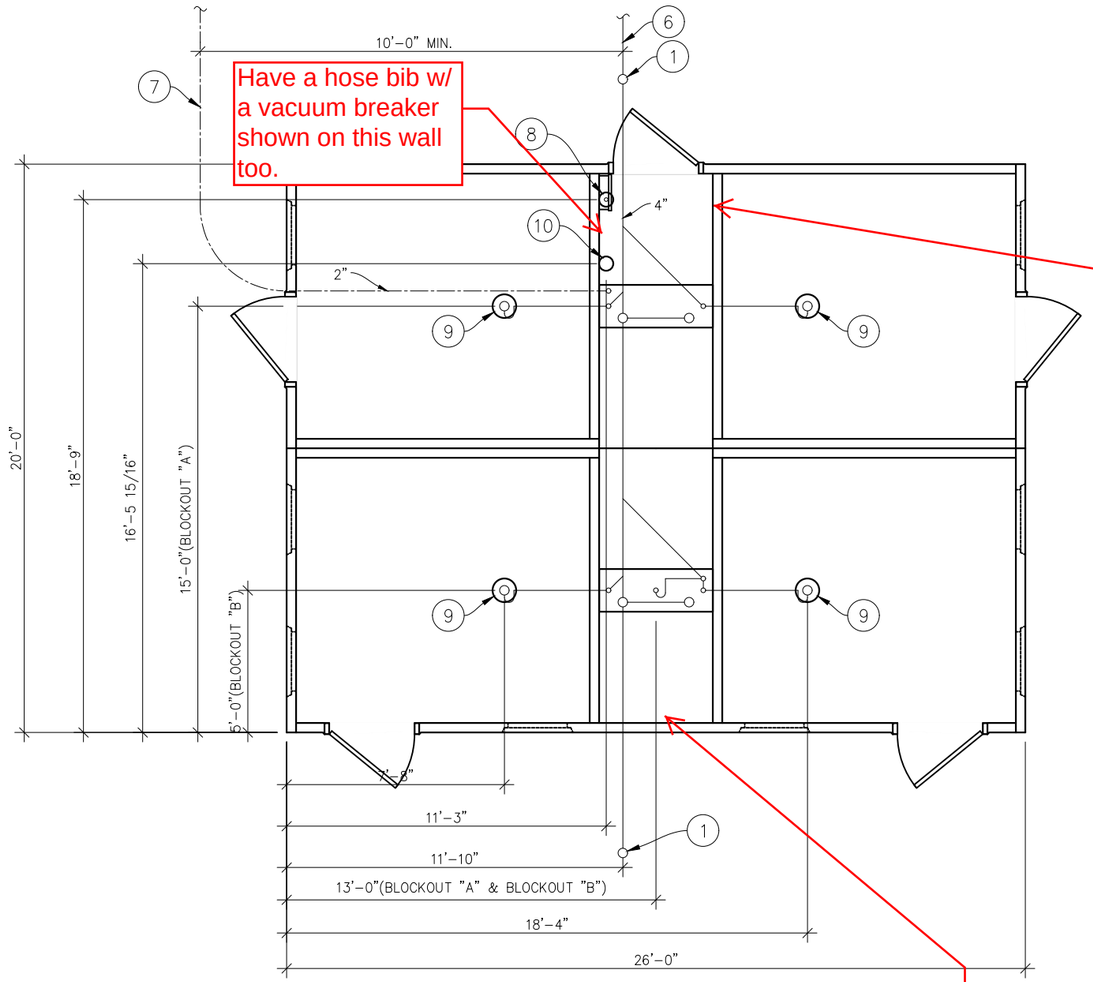
DRAWN	MICHAEL M	FILE NO.	A–083
CHECKED	MCT	PLOT	N/A

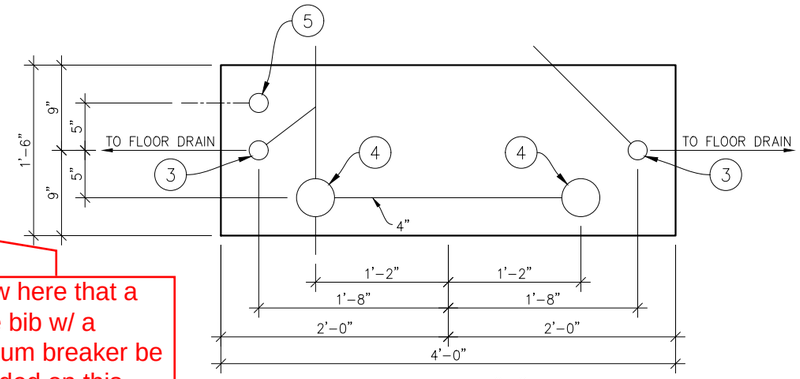
FOUNDATION
DETAIL

DWG NO.	SHEET	REV.
A–26	26 / 33	1

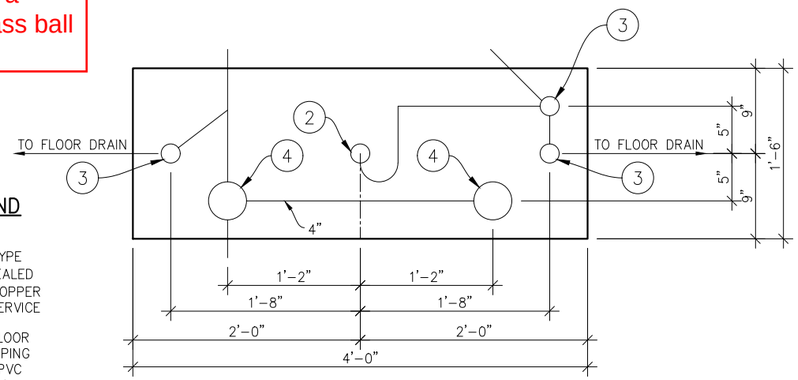


Show here that a hose bib w/ a vacuum breaker be included on this wall. Include a threaded brass ball valve too.

Plumbing to be routed to over here so it can be connected to drinking fountain to be installed by Layton City hired Contractor.



BLOCKOUT "A"



BLOCKOUT "B"

PIPING LEGEND

- 1 1/2" TYPE "K" ANNEALED "SOFT" COPPER WATER SERVICE
- BELOW FLOOR WASTE PIPING SCH 40 PVC TYPE DWV
- BELOW FLOOR VENT PIPING SCH 40 PVC TYPE DWV

FLOOR DRAIN BLOCKOUTS & BELOW FLOOR PIPING

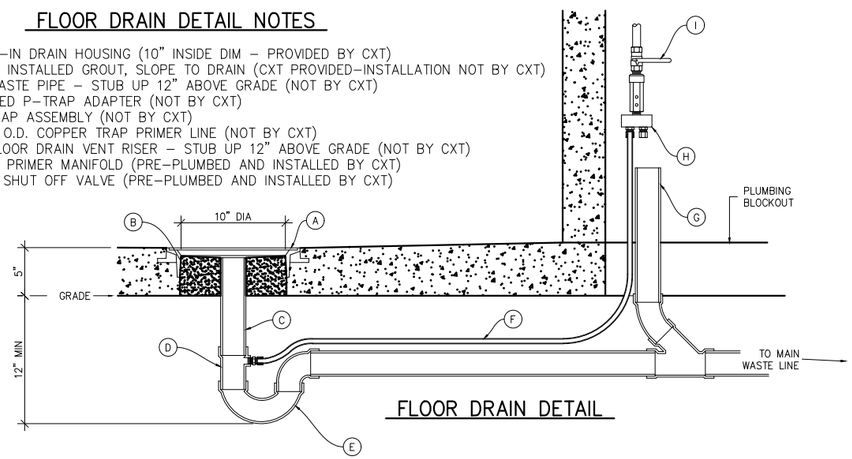
ALL PIPING INDICATED ON THIS SHEET IS NOT BY CXT

BELOW FLOOR PIPING – KEY NOTES

1. 4" CLEAN OUT TO GRADE.
2. 2" FLOOR DRAIN. FIELD INSTALLED TRAP PRIMER SYSTEM IF REQUIRED BY AUTHORITY HAVING JURISDICTION. (2'-8" x 1'-4" BLOCKOUT)
3. 2" VENT PIPES EXTENDED 12" ABOVE FINISHED FLOOR LEVEL, PROVIDE TEST PLUG. (2'-8" x 1'-4" BLOCKOUT)
4. 4" WASTE PIPE EXTENDED 12" ABOVE FINISHED FLOOR LEVEL, PROVIDE TEST PLUG. (2'-8" x 1'-4" BLOCKOUT)
5. 2" TYPE K ANNEALED "SOFT" COPPER WATER SERVICE EXTENDED 12" ABOVE FINISHED FLOOR LEVEL, PROVIDE CAP AT END. (2'-8" x 1'-4" BLOCKOUT)
6. 30" MIN. BURY, PROVIDE TRACER TAPE.
7. MIN. BURY PER LOCAL REQUIREMENTS TO PROTECT AGAINST FREEZING AND DAMAGE.
8. ELECTRICAL STUB UP, (6" DIAMETER BLOCKOUT)
9. 2" FLOOR DRAIN. FIELD INSTALLED TRAP PRIMER SYSTEM IF REQUIRED BY AUTHORITY HAVING JURISDICTION. (10" DIA BLOCKOUT)
10. 8" ROUND BLOCKOUT FOR CUSTOMER EQUIPMENT.

FLOOR DRAIN DETAIL NOTES

A. CAST-IN DRAIN HOUSING (10" INSIDE DIM – PROVIDED BY CXT)
B. FIELD INSTALLED GROUT, SLOPE TO DRAIN (CXT PROVIDED-INSTALLATION NOT BY CXT)
C. 2" WASTE PIPE – STUB UP 12" ABOVE GRADE (NOT BY CXT)
D. TAPPED P-TRAP ADAPTER (NOT BY CXT)
E. P-TRAP ASSEMBLY (NOT BY CXT)
F. 1/2" O.D. COPPER TRAP PRIMER LINE (NOT BY CXT)
G. 2" FLOOR DRAIN VENT RISER – STUB UP 12" ABOVE GRADE (NOT BY CXT)
H. TRAP PRIMER MANIFOLD (PRE-PLUMBED AND INSTALLED BY CXT)
I. 1/2" SHUT OFF VALVE (PRE-PLUMBED AND INSTALLED BY CXT)



FLOOR DRAIN DETAIL

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BUILDING NUMBER A-082

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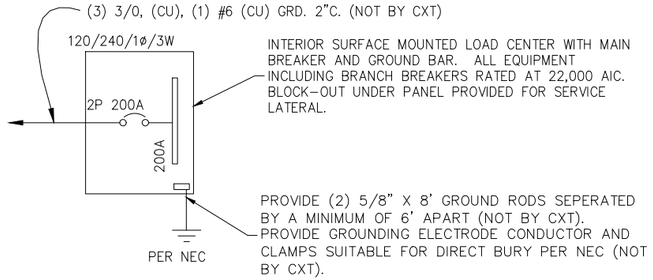
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

SCALE	3/16"=1'-0"	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	64

FLOOR DRAIN LOCATIONS & BELOW FLOOR PIPING

DWG NO.	SHEET	REV.
A-27	27/33	1



ONE-LINE POWER DIAGRAM

NTS

GENERAL ELECTRICAL NOTES

1. RECESSED JUNCTION BOXES FOR SINGLE DEVICES SHALL HAVE SINGLE GANG MUD RINGS CAST IN CONCRETE WALLS.
2. ALL RECEPTACLES SHALL BE GFCI PROTECTED BY CIRCUIT BREAKERS, OR BY OTHER GFCI RECEPTACLES.
3. ALL CONDUIT SHALL BE SIZED PER NEC. (SEE REF TABLE) EXPOSED CONDUIT SHALL BE EMT/FMC, RECESSED SHALL BE PVC.
4. INSTALL ALL WIRING IN CONDUIT OR RELATED ENCLOSURES.
5. ALL ELECTRICAL INSTALLATIONS SHALL MEET THE 2020 NATIONAL ELECTRIC CODE..
6. MINIMUM WIRE SIZE SHALL BE #12 AWG COPPER, THHN INSULATION UNLESS NOTED OTHERWISE.
7. ROUTE ALL CONDUITS IN UTILITY ROOM AT CEILING OR FACE OF WALLS.
8. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE & MAY NOT SHOW EXACT LOCATIONS OF DEVICES. REFER TO WALL PANEL & OTHER DRAWINGS FOR EXACT LOCATIONS OF J-BOXES, ETC..
9. ALL CONDUCTORS AND CABLES MUST BE PROPERLY TERMINATED IN APPROVED BOXES, BEFORE CONNECTING THE CIRCUIT TO THE BREAKER AND BEFORE RECEIVING FINAL INSPECTION APPROVAL IN THE FACTORY.
10. PROVIDE CIRCUIT BREAKER LOCKOUT TABS FOR ALL HAND DRYERS
11. PROVIDE 2 POLE 30A DISCONNECT FOR WATER HEATER. WATER HEATER CIRCUIT TO BE #10 AWG.

EXHAUST FAN SCHEDULE

SYM	MFR	MODEL #	CFM	SONES	VOLTS	AMPS	NTS.
EF-1	FANTECH	FG-4XL	170	6.0	120	0.6	1

NOTE
1. FANS LISTED FOR WET LOCATION, CONTROL VIA OCCUPANCY SENSOR. MOUNT SPEED CONTROL IN CHASE.

PANEL SCHEDULE

AMP 200 — PANEL — TOTAL CONNECTED VA LOAD 11,138
SURFACE MOUNT — 120/240V, 1P, 3W — TOTAL CALCULATED VA LOAD 12,566

CIRCUIT NO.	DESCRIPTION	OCP	TYPE	LOAD (VA)	(A)	PH
1	PHOTO CONTROLLED EXTERIOR LIGHTS	1P/20A	C	70	0.6	A
3	CHASE LIGHT	1P/20A	N	28	0.2	B
5	RESTROOM #1 LIGHT & FAN	1P/20A	N	100	0.8	A
7	RESTROOM #1 GFCI OUTLET	1P/20A	N	180	1.5	B
9	RESTROOM #1 HAND DRYER	1P/20A	L	1,140	9.5	A
11	RESTROOM #4 LIGHT & FAN	1P/20A	N	100	0.8	B
13	RESTROOM #4 GFCI OUTLET	1P/20A	N	180	1.5	A
15	RESTROOM #4 HAND DRYER	1P/20A	N	1,140	9.5	B
17	PLUMBING SENSORS	1P/20A	R	140	1.2	A
19	GFCI BREAKER FOR CUSTOMER USE	1P/20A	R	180	1.5	B
21						A
23						B
25						A
27						B
29						A
31						B

CIRCUIT NO.	DESCRIPTION	OCP	TYPE	LOAD (VA)	(A)	PH
2	CHASE RECEPTACLE	1P/20A	R	180	1.5	A
4	RESTROOM #2 LIGHT & FAN	1P/20A	N	100	0.8	B
6	RESTROOM #2 GFCI OUTLET	1P/20A	N	180	1.5	A
8	RESTROOM #2 HAND DRYER	1P/20A	N	1,140	9.5	B
10	RESTROOM #3 LIGHT & FAN	1P/20A	N	100	0.8	A
12	RESTROOM #3 GFCI OUTLET	1P/20A	N	180	1.5	B
14	RESTROOM #3 HAND DRYER	1P/20A	N	1,140	9.5	A
16	WATER HEATER #1	2P/30A	C	2,250	18.8	B
18			C	2,250	18.8	A
20	BREAKER FOR CUSTOMER USE	1P/20A	R	360	3.0	B
22						A
24						B
26						A
28						B
30						A
32						B

NOTE: MAXIMUM ALLOWABLE AIC IS 22K AMPS, PANEL MODIFICATIONS WILL BE REQUIRED (NOT BY CXT) IF TRANSFORMER CAPACITY EXCEEDS 175 KVA.

LOAD	CONNECTED		CALCULATED	
(C)ONTINUOUS	4,570	x1.25	5,713	VA
(R)EC (1ST 10KVA)	860	x1.00	860	VA
(N)ON-CONTINUOUS	4,568	x1.00	4,568	VA
(L)ARGEST MOTOR	1,140	x1.25	1,425	VA
TOTAL LOAD	11,138		12,566	VA
			52.4	AMPS

LIGHTING FIXTURE SCHEDULE

FIXTURE NUMBER	VOLTAGE	WATTS	DESCRIPTION
A	120	28	**LUMINAIRE VPF84 INTERIOR LIGHT FIXTURE, VPF8-4-28W HP-4000K-120-CP-WHT-WET-OCC-TX/SD** SURFACE MOUNTED, LED LAMP 4 FT, WRAP AROUND LENS, LOW TEMPERATURE DRIVER, BUILT IN OCCUPANCY SENSOR ACTIVATED W/ ADDITIONAL OCCUPANCY SENSOR FOR FAN CONTROL
B	120	14	**SWOOP 610 LED EXTERIOR LIGHT, YWP610-14W HP-3500K-120-CP-BRZ-CAB/PC** EXTERIOR, VANDAL RESISTANT, WALL MOUNTED, 14 WATT, CLEAR PRISMATIC LENS, BUILT IN PHOTOELECTRIC CONTROL
C	120	28	**LUMINAIRE VPF84 INTERIOR LIGHT FIXTURE, VPF8-4-28W HP-4000K-120-CP-WHT-WET-TX/SD** SURFACE MOUNTED, LED LAMP 4 FT, WRAP AROUND LENS, LOW TEMPERATURE DRIVER, SWITCH ACTIVATED
D	120	28	**LUMINAIRE VPF84 INTERIOR LIGHT FIXTURE, VPF8-4-28W HP-4000K-120-CP-WHT-WET-OCC-TX/SD** SURFACE MOUNTED, LED LAMP 4 FT, WRAP AROUND LENS, LOW TEMPERATURE DRIVER, BUILT IN OCCUPANCY SENSOR ACTIVATED

NOTE: THE SOURCE OF EFFICACY OF EXTERIOR LIGHTING IS TO BE A MINIMUM OF 45 LUMENS PER WATT

CXT®
Precast Products
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901 N. Highway 77 Hillsboro, TX 76645
362 Waverly Road Williamstown, WV 26187

PROJECT TITLE
ARAPAHOE
BUILDING NUMBER A-082

REV.	DESCRIPTION	APPROVAL	DATE
1	APPLY CUSTOMER COMMENTS	MICHAEL M	04-25-22

SCALE	N/A	DATE	03-30-22
DRAWN	MICHAEL M	FILE NO.	A-083
CHECKED	MCT	PLOT	N/A

ELECTRICAL NOTES, LEGEND & SCHEDULES

DWG NO.	SHEET	REV.
A-30	30 / 33	1