

CITY AND COUNTY OF DENVER
STATE OF COLORADO



Department of Public Works
Contract Documents

Contract No: 201735948



Cranmer Park Sun Dial Terrace Renovation

July 17, 2017



NOTICE OF APPARENT LOW BIDDER

Krische Construction, Inc.
605 Weaver Park Road
Longmont, Colorado 80501

The EXECUTIVE DIRECTOR OF PUBLIC WORKS has considered the Bids submitted on **August 10, 2017** for work to be done and materials to be furnished in and for:

CONTRACT #201735948 Cranmer Park Sun Dial Terrace Renovation

as set forth in detail in the Contract Documents for the City and County of Denver, Colorado. It appears that your Bid is fair, equitable, and to the best interest of the City and County; therefore, said Bid is hereby accepted at the bid price contained herein, subject to the approval and execution of the Contract Documents by the City in accordance with the Charter of the City and County of Denver, and to your furnishing the items specified below. The award is based on the total bid items: **bid item numbers 02 40 00-1 through 44 42 80-3 (Seven-Five [75] total bid items plus add alt #1, bid items 44 42 90-1 through 44 42 90-9 (Nine [9] total add alt #1 bid items)** the total estimated cost thereof being: **One Million Nine Hundred Fifty Thousand Six Hundred Fifty-One Dollars and Thirty-Four Cents (\$1,950,651.34)**.

It will be necessary for you to appear forthwith at the office of the Department of Public Works, Contract Administration, 201 W. Colfax Ave., Dept 614, Denver, Colorado 80202, to receive the said Contract Documents, execute the same and return them to the Department of Public Works, Contract Administration within the time limit set forth in the Bid Package Documents.

In accordance with the requirements set forth in the Contract Documents, you are required to furnish the following documents:

- a. Insurance Certificates: General Liability and Automotive Liability, Workman's Compensation and Employer Liability;
- b. Payment and Performance Bond along with One original Power of Attorney relative to Performance and/or Payment Bond; and,

All construction Contracts made and entered into by the City and County of Denver are subject to Affirmative Action and Equal Opportunity Rules and Regulations, as adopted by the Manager of Public Works, and each contract requiring payment by the City of one-half million dollars (\$500,000.00) or more shall first be approved by the City Council acting by ordinance and in accordance with Section 3.2.6 of the Charter of the City and County of Denver.

Prior to issuance of Notice to Proceed, all Equal Opportunity requirements must be completed. Additional information may be obtained by contacting the Director of Contract Compliance at (720-913-1700).

Denver Public Works/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw
p. 720.865.8630 | f. 720.865.8795



NOTICE OF APPARENT LOW BIDDER

CONTRACT NO. 201735948

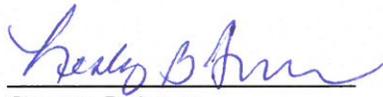
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The Bid Security submitted with your Bid, will be returned upon execution of the Contract and furnishing of the Performance Bond. In the event you should fail to execute the Contract and to furnish the performance Bond within the time limit specified, said Bid Security will be retained by the City and County of Denver as liquidated damages, and not as a penalty for the delay and extra work caused thereby.

Dated at Denver, Colorado this 18th day of October 2017.

CITY AND COUNTY OF DENVER

By


George Delaney

Interim Executive Director of Public Works

cc: Kristen Moore (CAO), taxauditadmin@denvergov.org (Treasury/Tax Compliance), Casey McCurdy (Treasury/Tax Compliance), Cindy Ackerman (DSBO), Jennifer Olson (P&R PM), Kim Blair (PM), Arielle Denis (PW-Aud), Mark Tabor (P&R), File.

Denver Public Works/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202

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CITY AND COUNTY OF DENVER

STATE OF COLORADO



Department of Public Works

Bid Form Packet

Contract No: 201735948



Cranmer Park Sun Dial Terrace Renovation

July 17, 2017

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management**

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This Checklist is provided solely for the assistance of the bidders, and need not be returned by Bidders with your BID FORM PACKAGE.

BIDDER'S CHECKLIST

These forms comprise the Bid Form and Submittal Package. Designated forms must be completed and turned in at the time of Bid Opening. Bidders should refer to the Contract Documents, particularly the Instructions to Bidders, accompanying this package, in completing these forms.

FORM/ PAGE NO.	COMMENTS	COMPLETE
BF-4 – BF-5	a.) Legal name, address, Acknowledgment signature and attestation (if required.)	<input type="checkbox"/>
BF-6+	a.) Fill in individual bid item dollars and totals in Numerical figures only b.) Complete all blanks c.) Legal name required	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
BF-7	a.) Write out bid total or bid totals in words and figures in the blank form space(s) provided b.) Calculate Textura® Construction Payment Management System Fee from chart on pg. BF-3 and write % and fee in the space provided	<input type="checkbox"/> <input type="checkbox"/>
BF-8	a.) List all subcontractors who are performing work on this project	<input type="checkbox"/>
BF-9 – BF-10	a.) Fully complete List of Proposed Minority /Woman Business Enterprise Bidders, Subcontractors, Suppliers, Manufacturers, or Brokers – check appropriate boxes.	<input type="checkbox"/>
BF-11	a.) Complete all blanks b.) If Addenda have been issued, complete bottom section.	<input type="checkbox"/> <input type="checkbox"/>
BF-12	a.) Complete appropriate sections - signature(s) required. b.) If corporation, then corporate seal required.	<input type="checkbox"/> <input type="checkbox"/>
BF-13	a.) Fully complete Commitment to Participation	<input type="checkbox"/>
BF-16	a.) If applicable, fully complete Joint Venture Affidavit (Submit 10 days prior to Bid Opening date)	<input type="checkbox"/>
BF-17 – BF-19	a.) If applicable, fully complete Joint Venture Eligibility Form (Submit 10 days prior to Bid Opening date)	<input type="checkbox"/>
BF-20	a.) Fill in all Bid Bond blanks b.) Signatures required c.) Corporate Seal if required d.) Dated e.) Attach Surety Agents Power of Attorney or Certified or cashier's check made out to the Manager of Revenue referencing Bidder's Company and Contract Number.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
BF-21- BF-24	a.) Each bidder, as a condition of responsiveness to this solicitation, shall <u>complete and return</u> the "Diversity and Inclusiveness in City Solicitations Information Request Form" with their Bid.	<input type="checkbox"/>

Textura ® Construction Payment Management System (CPM System)

Contractor recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System (CPM System) for this Project. All fees associated with the CPM System are to be paid by the Contractor for billings for work performed. Bidders are required, when preparing a bid, to enter the price of the CPM service on the line provided for the service. The fee is all inclusive of all subcontractor, project and subscription fees associated with the CPM system. The bidder will calculate the fee based on a percentage of their total bid, and then should include it on the line item provided in the bid form labeled “Textura® Construction Payment Management System Fee”. This expense becomes part of the contract and billable to the City. All costs including but not limited to costs associated with training, entering data or utilizing Textura other than the Textura Construction Payment Management System Fee are overhead and shall not be reimbursed by the City. Contractor is responsible for any tax on Textura fee. As with other taxes, the City will not reimburse Contractor for this cost and therefore this cost should be included in Contractor’s bid. Textura will invoice the awarded contractor directly.

PROJECT SIZE	FEE (% OF BID)
< \$1,000,000	0.22% (.0022)
\$1,000,001 - \$5,000,000	0.17% (.0017)
\$5,000,001 - \$20,000,000	0.12% (.0012)
\$20,000,001 - \$50,000,000	0.10% (.0010)
\$50,000,001 - \$100,000,000	0.08% (.0008)
\$100,000,001 - \$500,000,000	0.05% (.0005)
> \$500,000,000	CONTACT TEXTURA FOR PROGRAM PRICING

For more information:

<http://www.denvergov.org/content/denvergov/en/contract-administration/bidding-process.html>

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management**

BID FORM AND SUBMITTAL PACKAGE ACKNOWLEDGMENT

CONTRACT NO. 201735948

CRANMER PARK SUN DIAL TERRACE RENOVATION

BIDDER: Krische Construction, Inc.
(Legal Name per Colorado Secretary of State)

ADDRESS: 605 Weaver Park Road
Longmont, CO 80501

The undersigned bidder states that the undersigned bidder has received and had an opportunity to fully and thoroughly examine a complete set of the Contract Documents for **Contract No. 201735948, CRANMER PARK SUN DIAL TERRACE RENOVATION**, made available to the undersigned bidder pursuant to Notice of Invitation for Bids dated July 17, 2017.

The undersigned bidder acknowledges that a complete and final set of the Contract Documents for the referenced Project, the components of which are identified below, are bound and maintained as the record set of Contract Documents by the Contract Administration Division of the Department of Public Works and that this Record Set is available for examination by the undersigned bidder.

The undersigned bidder, having thoroughly examined each of the components identified below and contained in Contract Documents, **HEREBY SUBMITS THIS BID FORM AND SUBMITTAL PACKAGE**, fully understanding that the Contract Documents, as defined in Paragraph 1 of the contract, including this executed Bid Form and Submittal Package, constitute all of the terms, conditions and requirements upon which this submission is based and further understanding that, by submission of this Bid Form and Submittal Package, the City shall rely on the representations and commitments of the undersigned bidder contained herein.

The following completed documents comprising this Bid Form and Submittal Package will be included with and, by this reference, are expressly incorporated into the Contract Documents specified at Paragraph 1 of the Contract:

- Bid Form and Submittal Package Acknowledgment Form
- Bid Form
- List of Proposed Minority/Woman Owned Business Enterprise(s)
- Commitment to Minority/Woman Owned Business Enterprise Participation
- Minority/Woman Owned Business Enterprise(s) of Intent
- Joint Venture Affidavit (if applicable)
- Joint Venture Eligibility Form (if applicable)
- Bid Bond
- Certificate of Insurance

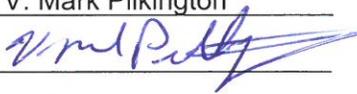
The following designated documents constitute that portion of the Contract Documents made available by the Notice of Invitation for Bids, but not included in the Bid Form and Submittal Package:

- Notice of Invitation for Bids
- Instructions to Bidders
- Addenda (as applicable)
- Equal Employment Opportunity Provisions (Appendix A and Appendix F)
- Contract Form
- General Contract Conditions
- Special Contract Conditions
- Performance and Payment Bond
- Notice to Apparent Low Bidder
- Notice to Proceed
- Contractor's Certification of Payment Form
- Final/Partial Lien Release Form
- Final Receipt
- Change Orders (as applicable)
- Federal Requirements (as applicable)
- Prevailing Wage Rate Schedule(s)
- Technical Specifications
- Contract Drawings
- Accepted Shop Drawings

The undersigned bidder expressly assumes responsibility for the complete contents of these designated documents as bound together with the Bid Form and Submittal Package submitted herewith and designated the Contract Documents.

IN WITNESS WHEREOF, the undersigned bidder has signed personally or by duly authorized officer or agent and duly attested.

BIDDER:

Name: V. Mark Pilkington
By: 
Title: President

ATTEST:

By: 
Krista Toepfer, Secretary

[SEAL]

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management**

BID FORM

**CONTRACT NO. 201735948
CRANMER PARK SUN DIAL TERRACE RENOVATION**

BIDDER Krische Construction, Inc.
(Legal Name per Colorado Secretary of State)

TO: The Manager of Public Works
City and County of Denver
c/o Contract Administration
201 West Colfax, Dept. 614
Denver, Colorado 80202

The Undersigned Bidder, having examined the plans, technical specifications, and remainder of the proposed Contract Documents as designated and enumerated in the General and Special Contract Conditions and any and all addenda thereto; having investigated the location of and conditions affecting the proposed Work; and being acquainted with and fully understanding the extent and character of the Work covered by this bid, and all factors and conditions affecting or which may be affected by Work, HEREBY SUBMITS THIS BID, pursuant to an advertisement of a Notice of Invitation for Bids as published on **July 17, 2017**, to furnish all required materials, tools, appliances, equipment and plant; to perform all necessary labor and to undertake and complete: **CONTRACT NO. 201735948, CRANMER PARK SUN DIAL TERRACE RENOVATION**, in Denver, Colorado, in full accordance with and conformity to the Plans, Technical Specifications, and Contract Documents hereto attached or by reference made a part hereof, at and for the following price(s) set forth on this Bid Form.

The following documents, which taken as a whole constitute the Contract Documents for this Project, and which are incorporated herein, by reference, were made available to the Bidder as provided in the Advertisement of Notice of Invitation for Bids, were received by the bidder, and form the basis for this bid:

- Advertisement of Notice of Invitation for Bids*
- Instructions to Bidders*
- Commitment to M/WBE Participation*
- Article III, Divisions 1 and 3 of Chapter 28, D.R.M.C.*
- Bid Bond*
- Addenda (as applicable)*
- Equal Employment Opportunity Provisions (Appendix A and Appendix F)*
- Bid Form*
- Contract Form*
- General Contract Conditions*
- Special Contract Conditions*
- Performance and Payment Bond*
- Notice to Apparent Low Bidder*
- Notice to Proceed*
- Contractor's Certification of Payment Form*
- Final/Partial Lien Release Form*
- Final Receipt*
- Change Orders (as applicable)*
- Federal Requirements (as applicable)*
- Prevailing Wage Rate Schedule(s)*
- Technical Specifications*
- Contract Drawing*
- Accepted Shop Drawings*
- Certificate of Insurance*

Item No.	Description and Price	Estimated Quantity	Estimated Cost
02 40 00-1	Mobilization @ 5% at the unit price of <u> \$57,066.57</u> per LUMP SUM.	1 LS	<u> \$57,066.57</u>
02 40 00-2	Erosion and sediment control silt fence at the unit price of <u> \$1,616.18</u> per LUMP SUM.	1 LS	<u> \$1,616.18</u>
02 40 00-3	Erosion and sediment control curb line protection at the unit price of <u> \$387.88</u> per LUMP SUM.	1 LS	<u> \$387.88</u>
02 40 00-4	Erosion and sediment control vehicle tracking control pad at the unit price of <u> \$3,232.35</u> per LUMP SUM.	1 LS	<u> \$3,232.35</u>
02 40 00-5	Erosion and sediment control concrete washout containment at the unit price of <u> \$2,055.78</u> per LUMP SUM.	1 LS	<u> \$2,055.78</u>
02 40 00-6	6" Temporary chain link construction fence at the unit price of <u> \$4,654.59</u> per LUMP SUM.	1 LS	<u> \$4,654.59</u>
02 40 00-7	Construction surveying at the unit price of <u> \$11,507.18</u> per LUMP SUM.	1 LS	<u> \$11,507.18</u>
02 41 00-1	Stone pavers, mortar setting bed and concrete slab at the unit price of <u> \$12,929.42</u> per LUMP SUM.	1 LS	<u> \$12,929.42</u>
02 41 00-2	Perimeter walls stone veneer, concrete stem/footer removal at the unit price of <u> \$9,050.59</u> per LUMP SUM.	1 LS	<u> \$9,050.59</u>
02 41 00-3	Perimeter steps concrete stem and footer removal at the unit price of <u> \$9,050.59</u> per LUMP SUM.	1 LS	<u> \$9,050.59</u>
02 41 00-4	Utility vault electrical service termination at the unit price of <u> \$3,103.06</u> per LUMP SUM.	1 LS	<u> \$3,103.06</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
02 41 00-5	Utility vault sanitary service termination at the unit price of <u> \$3,620.24</u> per LUMP SUM.	1 LS	<u> \$3,620.24</u>
02 41 00-6	Utility vault entry walls, slab, door and frame removal at the unit price of <u> \$3,620.24</u> per LUMP SUM.	1 LS	<u> \$3,620.24</u>
02 41 00-7	Utility vault wall bracing at the unit price of <u> \$646.47</u> per LUMP SUM.	1 LS	<u> \$646.47</u>
02 41 00-8	Utility vault saw cut and remove upper walls at the unit price of <u> \$1,939.41</u> per LUMP SUM.	1 LS	<u> \$1,939.41</u>
02 41 00-9	Utility vault roof removal at the unit price of <u> \$1,810.12</u> per LUMP SUM.	1 LS	<u> \$1,810.12</u>
02 41 00-10	Utility vault import, place and compact structural fill at the unit price of <u> \$3,232.35</u> per LUMP SUM.	1 LS	<u> \$3,232.35</u>
03 30 00-1	Structural concrete wall and step section footers at the unit price of <u> \$258,986.57</u> per LUMP SUM.	1 LS	<u> \$258,986.57</u>
03 30 00-2	Structural concrete pivot slab at the unit price of <u> \$7,899.87</u> per LUMP SUM.	1 LS	<u> \$7,899.87</u>
03 30 00-3	Structural concrete sundial foundation at the unit price of <u> \$3,440.52</u> per LUMP SUM.	1 LS	<u> \$3,440.52</u>
03 30 00-4	Structural concrete accessible ramp at the unit price of <u> \$3,542.66</u> per LUMP SUM.	1 LS	<u> \$3,542.66</u>
31 11 00-1	Evergreen shrub mass removal at the unit price of <u> \$1,034.35</u> per LUMP SUM.	1 LS	<u> \$1,034.35</u>
33 11 00-2	Turf grass removal (including top 2" of soil) at the unit price of <u> \$14,868.83</u> per LUMP SUM.	1 LS	<u> \$14,868.83</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
31 20 00-1	Cut disposed of off site at the unit price of <u> \$58,647.84</u> per LUMP SUM.	1 LS	<u> \$58,647.84</u>
31 20 00-2	Import, place and compact structural fill at the unit price of <u> \$92,843.56</u> per LUMP SUM.	1 LS	<u> \$92,843.56</u>
32 12 16-1	Asphalt saw cut at the unit price of <u> \$646.47</u> per LUMP SUM.	1 LS	<u> \$646.47</u>
32 12 16-2	Asphalt pavement removal at the unit price of <u> \$5,430.36</u> per LUMP SUM.	1 LS	<u> \$5,430.36</u>
32 12 16-3	Asphalt pavement replacement with base course at the unit price of <u> \$21,828.41</u> per LUMP SUM.	1 LS	<u> \$21,828.41</u>
32 12 16-4	Parking blocks at the unit price of <u> \$1,344.66</u> per LUMP SUM.	1 LS	<u> \$1,344.66</u>
32 12 16-5	Pavement marking at the unit price of <u> \$941.26</u> per LUMP SUM.	1 LS	<u> \$941.26</u>
32 13 13-1	Concrete pavement at the unit price of <u> \$30,787.79</u> per LUMP SUM.	1 LS	<u> \$30,787.79</u>
32 13 13-2	Concrete curb and gutter at the unit price of <u> \$8,886.52</u> per LUMP SUM.	1 LS	<u> \$8,886.52</u>
32 13 13-3	Concrete curb at the unit price of <u> \$2,200.20</u> per LUMP SUM.	1 LS	<u> \$2,200.20</u>
32 80 00-1	Irrigation system reconfiguration and replacement at the unit price of <u> \$11,959.71</u> per LUMP SUM.	1 LS	<u> \$11,959.71</u>
32 91 20-1	Import, place, shape and compact pre-amended topsoil at the unit price of <u> \$7,919.27</u> per LUMP SUM.	1 LS	<u> \$7,919.27</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
32 92 23-1	Scarify, rough and fine grade surface to receive new sod at the unit price of <u> \$1,616.18</u> per LUMP SUM.	1 LS	<u> \$1,616.18</u>
32 92 23-2	New sod installation at the unit price of <u> \$14,222.36</u> per LUMP SUM.	1 LS	<u> \$14,222.36</u>
33 46 00-1	Drainage pipe at the unit price of <u> \$25,858.83</u> per LUMP SUM.	1 LS	<u> \$25,858.83</u>
33 46 00-2	Buried clean outs at the unit price of <u> \$3,620.24</u> per LUMP SUM.	1 LS	<u> \$3,620.24</u>
33 46 00-3	Day light rodent screen at the unit price of <u> \$1,551.53</u> per LUMP SUM.	1 LS	<u> \$1,551.53</u>
33 46 00-4	Sand leveling bed at the unit price of <u> \$34,480.17</u> per LUMP SUM.	1 LS	<u> \$34,480.17</u>
33 46 00-5	Crushed rock stabilizer bed at the unit price of <u> \$17,157.34</u> per LUMP SUM.	1 LS	<u> \$17,157.34</u>
33 46 00-6	Geotextile filter fabric at the unit price of <u> \$11,377.89</u> per LUMP SUM.	1 LS	<u> \$11,377.89</u>
33 46 00-7	Washed river rock drainage medium at the unit price of <u> \$42,667.08</u> per LUMP SUM.	1 LS	<u> \$42,667.08</u>
33 47 00-1	Existing panorama documentation at the unit price of <u> \$1,034.35</u> per LUMP SUM.	1 LS	<u> \$1,034.35</u>
33 47 00-2	Stone inset salvage, cleaning and storage at the unit price of <u> \$1,292.94</u> per LUMP SUM.	1 LS	<u> \$1,292.94</u>
33 47 00-3	Stone inset reinstallation at the unit price of <u> \$1,292.94</u> per LUMP SUM.	1 LS	<u> \$1,292.94</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
33 47 00-4	Rustic terrazzo installation at the unit price of <u> \$95,501.85</u> per LUMP SUM.	1 LS	<u> \$95,501.85</u>
33 48 00-1	Upper terrace ashlar pattern dry set sand stone pavers at the unit price of <u> \$446,695.84</u> per LUMP SUM.	1 LS	<u> \$446,695.84</u>
33 48 00-2	Lower terrace random pattern dry set sand stone pavers at the unit price of <u> \$129,824.28</u> per LUMP SUM.	1 LS	<u> \$129,824.28</u>
33 48 00-3	Dry set grade transition step blocks at the unit price of <u> \$85,722.03</u> per LUMP SUM.	1 LS	<u> \$85,722.03</u>
44 41 00-1	Crane rental (six operations) at the unit price of <u> \$3,749.53</u> per LUMP SUM.	1 LS	<u> \$3,749.53</u>
44 41 00-2	Hauling (three operations) at the unit price of <u> \$2,657.00</u> per LUMP SUM.	1 LS	<u> \$2,657.00</u>
44 41 00-3	Refacing surface of sundial at the unit price of <u> \$13,963.77</u> per LUMP SUM.	1 LS	<u> \$13,963.77</u>
44 41 00-4	Recutting text and line work at the unit price of <u> \$12,257.09</u> per LUMP SUM.	1 LS	<u> \$12,257.09</u>
44 41 00-5	Resetting at the unit price of <u> \$6,568.14</u> per LUMP SUM.	1 LS	<u> \$6,568.14</u>
44 42 00-1	Existing text and line work documentation at the unit price of <u> \$2,702.25</u> per LUMP SUM.	1 LS	<u> \$2,702.25</u>
44 42 00-2	Steel finished rose red granite replacement at the unit price of <u> \$12,827.27</u> per LUMP SUM.	1 LS	<u> \$12,827.27</u>
44 42 00-3	Hauling loading and resetting at the unit price of <u> \$6,529.36</u> per LUMP SUM.	1 LS	<u> \$6,529.36</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
44 42 00-4	Replace two broken terrazzo marker stones at the unit price of <u> \$775.77</u> per LUMP SUM.	1 LS	<u> \$775.77</u>
44 42 00-5	Remove, store and reset park ID stone at the unit price of <u> \$672.33</u> per LUMP SUM.	1 LS	<u> \$672.33</u>
44 42 00-6	Cut directional arrows in reset caps at the unit price of <u> \$1,034.35</u> per LUMP SUM.	1 LS	<u> \$1,034.35</u>
44 42 20-1	Four inch square sand stone place holder blocks at the unit price of <u> \$10,255.61</u> per LUMP SUM.	1 LS	<u> \$10,255.61</u>
44 42 20-2	Concrete curb at the unit price of <u> \$517.18</u> per LUMP SUM.	1 LS	<u> \$517.18</u>
44 42 20-3	Sand setting bed at the unit price of <u> \$1,991.13</u> per LUMP SUM.	1 LS	<u> \$1,991.13</u>
44 42 20-4	Drainage rock at the unit price of <u> \$51.72</u> per LUMP SUM.	1 LS	<u> \$51.72</u>
44 42 40-1	Salvage, store and reinstall existing sign at the unit price of <u> \$258.59</u> per LUMP SUM.	1 LS	<u> \$258.59</u>
44 42 40-2	New trash receptacle at the unit price of <u> \$2,645.75</u> per LUMP SUM.	1 LS	<u> \$2,645.75</u>
44 42 40-3	Salvage, store and reinstall existing bench w/plaque at the unit price of <u> \$1,292.94</u> per LUMP SUM.	1 LS	<u> \$1,292.94</u>
44 42 40-4	Salvage, store and reinstall dog waste bag dispenser at the unit price of <u> \$193.94</u> per LUMP SUM.	1 LS	<u> \$193.94</u>
44 42 60-1	Assessable ramp hand rail with embed plates at the unit price of <u> \$9,751.37</u> per LUMP SUM.	1 LS	<u> \$9,751.37</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
44 42 60-2	Interpretive sign post and footer installation at the unit price of <u> \$193.94</u> per LUMP SUM.	1 LS	<u> \$193.94</u>
44 42 80-1	Sandstone veneer at the unit price of <u> \$48,698.65</u> per LUMP SUM.	1 LS	<u> \$48,698.65</u>
44 42 80-2	Salvage, store and clean step and cap stones at the unit price of <u> \$76,109.01</u> per LUMP SUM.	1 LS	<u> \$76,109.01</u>
44 42 80-3	Reinstall step and cap stones at the unit price of <u> \$113,578.46</u> per LUMP SUM.	1 LS	<u> \$113,578.46</u>
75 ITEMS	BASE BID TOTAL		<u>\$1,905,922.85</u> ^{87 D.U.}
	ADD ALT #1 Drinking Fountain		
44 42 90-1	Drinking fountain removal and delivery at the unit price of <u> \$800.00</u> per LUMP SUM.	1 LS	<u> \$800.00</u>
44 42 90-2	Memorial ring removal, storage and reinstallation at the unit price of <u> \$3,233.40</u> per LUMP SUM.	1 LS	<u> \$3,233.40</u>
44 42 90-3	Point of connection at the unit price of <u> \$780.00</u> per LUMP SUM.	1 LS	<u> \$780.00</u>
44 42 90-4	Service line with asphalt patch at the unit price of <u> \$18,000.00</u> per LUMP SUM.	1 LS	<u> \$18,000.00</u>
44 42 90-5	Stop and waste valve at the unit price of <u> \$175.00</u> per LUMP SUM.	1 LS	<u> \$175.00</u>
44 42 90-6	Barrier free fountain at the unit price of <u> \$10,500.00</u> per LUMP SUM.	1 LS	<u> \$10,500.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
44 42 90-7	Waste piping at the unit price of <u> \$3,500.00</u> per LUMP SUM.	1 LS	<u> \$3,500.00</u>
44 42 90-8	Drain sump with lid, ring, cover and rock at the unit price of <u> \$500.00</u> per LUMP SUM.	1 LS	<u> \$500.00</u>
44 42 90-9	Landscape restoration at the unit price of <u> \$4,000.00</u> per LUMP SUM.	1 LS	<u> \$4,000.00</u>
9 ITEMS	ALT #1 TOTAL		<u>\$41,488.40</u>
	ADD ALT #2 Stone Paver Salvage		
44 41 00-1	Upper terrace select stone salvage and palletize at the unit price of <u> \$7,682.00</u> per LUMP SUM.	1 LS	<u> \$7,682.00</u>
1 ITEM	ALT #2 TOTAL		<u>\$7,682.00</u>

Bid Items Total Amount (02 40 00-1 through 44 42 80-3 (Seventy-Five[75]) total bid items) \$ 1,905,922.85 ⁸⁷

Textura ® Fee from table on Page BF-3 0.17 % of Bid Items Total Amount \$ 3,240.07

Bid Items Total Amount plus Textura® Fee equals Total Bid Amount \$ 1,909,162.92 ⁹⁴

Total Bid Amount:
One Million Nine Hundred Nine Thousand One Hundred Sixty Two Dollars and ^{Four} ~~Ninety Two~~ Cents
Dollars (\$ 1,909,162.92)

Add Alternate #1

Add Alt #1: Drinking Fountain. (Contract Specifications 44 42 90-1 through 44 42 90-9)

Amount of Forty One Thousand Four Hundred Eighty Eight Dollars and Forty Cents

Dollars (\$ 41,488.40)

Add Alternate #2

Add Alt #1: Stone Paver Salvage. (Contract Specifications 44 41 00-1)

Amount of Seven Thousand Six Hundred Eighty Two Dollars

Dollars (\$ 7682.00)

If the Manager mails a written Notice of Apparent Low Bidder, addressed to the Bidder's business address stated on this Bid Form, the Undersigned Bidder shall, in accordance with the Contract Documents, be ready to, and shall, within five (5) days after the date of the Notice: (i) execute the attached form of Contract in conformity with this bid; (ii) furnish the required proofs of insurance; and (iii) furnish the required bond or bonds in the sum of the full amount of this bid, executed by a surety company acceptable to the Manager.

The Hartford Casualty Insurance Co, a corporation of the State of CT, is hereby offered as Surety on said bond. If such surety is not approved by the Manager, another and satisfactory surety company shall be furnished.

Enclosed with this bid is a bid guarantee, as defined in the attached Instructions to Bidders, in the amount of 5% of total bid. The Undersigned Bidder agrees that the entire amount of this bid guarantee is to be paid to and become the property of the City as liquidated damages, and not as a penalty, if: (i) the bid is considered to be the best by the City; (ii) the City notifies the Undersigned Bidder that it is the Apparent Low Bidder; and (iii) the Undersigned Bidder fails to execute the Contract in the form prescribed or to furnish the required bond and proofs of insurance, within five (5) days after the date of such notification.

The following persons, firms or corporations are interested with the Undersigned Bidder in this bid:

Name: None Name: _____

Address: _____ Address: _____

If there are no such persons, firms, or corporations, please so state in the following space:

The Undersigned Bidder proposes to subcontract the following Work in accordance with General Contract Conditions, Title 5, SUBCONTRACTS, and represents that, to the greatest degree practical, all subcontractors known at the time of bid submittal have been identified.

Item of Work	Percent (%) of Total; Work	Proposed Subcontractor and Address
<u>Masonry / Pavers</u>	<u>39%</u>	<u>Building Restoration Specialties 3060 Walnut St. Denver, CO</u>
<u>Terrazo</u>	<u>4%</u>	<u>Finn-Wall 6915 South 700 West Midvale, UT</u>
<u>Asphalt Paving</u>	<u>1%</u>	<u>Martin Marietta 1627 Cole Blvd. Ste, 200 Lakewood, CO</u>
<u>Landscape/Irrigation</u>	<u>1%</u>	<u>Western States Reclamation 3756 Imperial St. Frederick, CO</u>
<u>Concrete Formwork</u>	<u>3%</u>	<u>E-W Concrete 10572 Hillcrest Dr. Longmont, CO</u>
<u>Survey</u>	<u><1%</u>	<u>Flatirons 3825 Iris Ave, 395 Boulder, CO</u>
<u> </u>	<u> </u>	<u> </u>
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DENVER
OFFICE OF ECONOMIC
DEVELOPMENT

**List of Proposed
MWBE
Bidders, Subcontractors,
Suppliers (Manufacturers) or
Brokers**

Office of Economic Development
Division of Small Business Opportunity
Compliance Unit
201 W. Colfax Ave. Dept. 907
Denver, CO 80202
Phone: 720-913-1999
D5BO@denvergov.org

City & County of Denver Contract No.: 201735948

The undersigned Bidder proposes to utilize all listed firms. The following MWBE(s) firms listed are CURRENTLY certified by the City and County of Denver. Only the level of MWBE participation listed at the bid opening will count toward satisfaction of the project goal. Only bona fide commissions may be counted for Brokers. MWBE prime bidders must detail their bid information below. Please copy and attach this page to list additional MWBE.

Prime Bidder

Business Name: Krische Construction, Inc.		
Address: 605 Weaver Park Road, Longmont		Contact Person: Mark Pilkington
Type of Service: General Contractor	Dollar Amount: \$: \$215,000	Percent of Project: 11%

Certified MWBE Prime Bidder

Business Name:		
Address:		Contact Person:
Type of Service:	Dollar Amount: \$:	Percent of Project:

Subcontractors, Suppliers Manufacturers or Brokers (check one box)

<input checked="" type="checkbox"/> Subcontractor (✓)	<input type="checkbox"/> Supplier (✓)	<input type="checkbox"/> Manufacturer (✓)	<input type="checkbox"/> Broker (✓)
Business Name: Building Restoration Specialties			
Address: 3060 Walnut St. Denver, CO 80205		Type of Service: Masonry/Pavers	
Contact Person: Rhonda Mass		Dollar Amount: \$: 779,609	Percent of Project: 39%
<input checked="" type="checkbox"/> Subcontractor (✓)	<input type="checkbox"/> Supplier (✓)	<input type="checkbox"/> Manufacturer (✓)	<input type="checkbox"/> Broker (✓)

Business Name:			
Address:		Type of Service:	
Contact Person:		Dollar Amount: \$:	Percent of Project:
<input type="checkbox"/> Subcontractor (✓)	<input type="checkbox"/> Supplier (✓)	<input type="checkbox"/> Manufacturer (✓)	<input type="checkbox"/> Broker (✓)

Business Name:			
Address:		Type of Service:	
Contact Person:		Dollar Amount: \$:	Percent of Project:

Rev 031816JE

Subcontractors, Suppliers Manufacturers or Brokers (check one box)							
<input type="checkbox"/>	Subcontractor (✓)	<input type="checkbox"/>	Supplier (✓)	<input type="checkbox"/>	Manufacturer (✓)	<input type="checkbox"/>	Broker (✓)
Business Name:							
Address:				Type of Service:			
Contact Person:				Dollar Amount: \$:		Percent of Project:	
<input type="checkbox"/>	Subcontractor (✓)	<input type="checkbox"/>	Supplier (✓)	<input type="checkbox"/>	Manufacturer (✓)	<input type="checkbox"/>	Broker (✓)
Business Name:							
Address:				Type of Service:			
Contact Person:				Dollar Amount: \$:		Percent of Project:	
<input type="checkbox"/>	Subcontractor (✓)	<input type="checkbox"/>	Supplier (✓)	<input type="checkbox"/>	Manufacturer (✓)	<input type="checkbox"/>	Broker (✓)
Business Name:							
Address:				Type of Service:			
Contact Person:				Dollar Amount: \$:		Percent of Project:	
<input type="checkbox"/>	Subcontractor (✓)	<input type="checkbox"/>	Supplier (✓)	<input type="checkbox"/>	Manufacturer (✓)	<input type="checkbox"/>	Broker (✓)
Business Name:							
Address:				Type of Service:			
Contact Person:				Dollar Amount: \$:		Percent of Project:	
<input type="checkbox"/>	Subcontractor (✓)	<input type="checkbox"/>	Supplier (✓)	<input type="checkbox"/>	Manufacturer (✓)	<input type="checkbox"/>	Broker (✓)
Business Name:							
Address:				Type of Service:			
Contact Person:				Dollar Amount: \$:		Percent of Project:	
<input type="checkbox"/>	Subcontractor (✓)	<input type="checkbox"/>	Supplier (✓)	<input type="checkbox"/>	Manufacturer (✓)	<input type="checkbox"/>	Broker (✓)
Business Name:							
Address:				Type of Service:			
Contact Person:				Dollar Amount: \$:		Percent of Project:	

Rev 031816JE

The undersigned Bidder hereby certifies that the aforementioned subcontractors and suppliers have full knowledge that their names have been offered as subcontractors and suppliers for the work, and the Bidder further certifies that the dollar amount of work to be performed by the aforementioned M/WBE(s) was furnished to the Bidder prior to the bid opening. The undersigned Bidder agrees that after the bid opening, it shall submit to the City an executed and completed W/MBE "Letter of Intent" in three working days (3) on each of its M/WBE subcontractors. The "Letter of Intent" form is contained in the Contract Documents.

The undersigned Bidder acknowledges the right of the City to reject any or all bids submitted, to waive informalities in bids and to re-advertise this Project for bids.

The undersigned certifies that it has carefully checked all works and figures and all statements made in these Bid Forms.

This bid is submitted upon the declaration that neither, I (we), nor, to the best of my (our) knowledge, none of the members of my (our) firm or company have either directly or indirectly entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this bid.

Business Address of Bidder: 605 Weaver Park Road

City, State, Zip Code: Longmont, CO 80501

Telephone Number of Bidder: 303-776-7643 Fax No. 303-776-9598

Social Security or Federal Employer ID Number of Bidder: 84-1066895

Name and location of the last work of this kind herein contemplated upon which the Bidder was engaged:
Meadow Park, Lyons, CO

For information relative thereto, please refer to:

Name: Sloan Nystrom

Title: Parks Project Manager, City of Lyons

Address: 425 5th Ave, Lyons, CO 80521

The undersigned acknowledges receipt, understanding, and full consideration of the following addenda to the Contract Documents:

Addenda Number 01 Date 8/4/17

Addenda Number _____ Date _____

Addenda Number _____ Date _____

Dated this 10th day of August, 2017.

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS**

CONTRACT NO: 201735948 PROJECT NAME: Cranmer Park Sun Dial Terrace Renovation
--

ADDENDUM NO. 1 TO CONTRACT DOCUMENTS

Bidders are hereby instructed that the drawings, specifications, and other contract documents are modified, corrected, supplemented and/or superseded for the above-mentioned project as hereinafter described in the following attachments:

This **ADDENDUM** shall be attached to, become a part of, and be returned with the Bid Proposal.

QUESTIONS AND ANSWERS

- Q1.** Detailed Removal Specification note 3) on sheet SDT-3 indicates we must sweep and wash streets daily. Please confirm this is correct or is it acceptable to sweep and wash streets only as required.
A1. Sweep and wash streets per erosion control BMPs.
- Q2.** Please clarify which specific fees/costs we are responsible for per note 2) on sheet SDT-12.
A2. Fees are identified in Note No.2. Contact Denver Water for confirmation.
- Q3.** Confirm that a water meter vault is required per note 7) on sheet SDT-12. The detail above indicates a meter pit, plus Denver Water only requires a meter pit for a ¾" meter.
A3. Both vaults / pits are required for a below ground double check valve installation as detailed. Assume standard ¾" DWB meter set with pit and 48" diameter double check valve vault.
- Q4.** Are the dovetail anchor slots to be stainless steel or galvanized? The plans indicate both.
A4. Please provide both slots and anchors as stainless steel.
- Q5.** Alternate 2 is to salvage 20% of the upper terrace pavers, however sheet SDT-3 indicates we are to salvage 20% in the base bid. Please clarify if Base Bid is to include salvaging 20% of the pavers.
A5. All field stone salvage is to be included in Add Alternate No.2 no base bid field stone salvage is required.
- Q6.** Can we get the bid schedule in an Excel file?
A6. The bid schedule was created in Word and is provided as an attachment to Addendum #1.
- Q7.** Please confirm, per Spec Section 01 50 00, that we are required to provide wireless internet service for the Project Manager and Consultants regardless of our own needs.
A7. Wireless internet service is only required if there is a construction trailer onsite.
- Q8.** Is it acceptable to recycle material per our own means/methods or must it all "be hauled to nearest recycling center" per Spec Section 02 41 00?

A8.

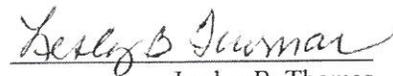
SC-19 GREENPRINT DENVER REQUIREMENTS

In accordance with the City and County of Denver Executive Order 123: Greenprint Denver Office and Sustainability Policy, as amended, Contractor shall adhere to sections of Executive Order 123 pertinent to the construction of the built environment. This includes but is not limited to: all construction and renovation of buildings shall follow instructions and memorandum for high performance buildings; horizontal projects shall include the use of fly ash concrete and recycled aggregate where possible; and, all projects shall recycle construction and demolition waste, and install materials that contain recycled content whenever possible using the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) as guidance. Non-hazardous solid waste that is eligible for reuse or recycling is not subject to the DADS disposal requirement defined in SC-12.

A completed "Greenprint Denver Closeout Form for Construction Projects" shall be delivered to the Project Manager as a submittal requirement of Final Acceptance.

<http://www.denvergov.org/constructioncontracts/Home/ContractorResources/tabid/443154/Default.aspx>

- Q9. Is it acceptable to use alternate subcontractors than those listed in the plans/specs for the refacing, engraving and restoration processes? If so, can the sun dial engraving occur on-site?
- A9. The re-facing of the sundial will require transportation to a facility with a wire saw.
- Q10. Clarify requirements for utility vault demo. Plans and bid schedule contradict in regard to wall and floor removal.
- A10. Include removal of utility vault vent and tunnel, steel railing and miscellaneous internal items in Bid Item 02 41 00-6. Vault floor and lower 24" of vault walls are to remain. Walls can be broken down and do not need to be saw cut.
- Q11. Indicate number of directional arrows to be included in bid item 44 42 00-5 as these are not noted on plans or specs.
- A11. Bid Item: 44 42 00-5: SDT-6 calls out clean and reset interpretive cap stone at two locations.
Bid Item: 44 42 00-6 calls out 4 ea. directional arrows. Arrows are appx. 8" long and 3/8" deep.
- Q12. Was there any asbestos or any other hazardous material found at the site?
- A12. No.
- Q13. When is the estimated start date?
- A13. We anticipate a NTP in October. Per our general contractor conditions, contractors must start within 10 days of the NTP.


Lesley B. Thomas
City Engineer

8-3-17

Date

The undersigned bidder acknowledges receipt of this Addendum. The Proposal submitted herewith is in accordance with the stipulations set forth herein.


KRUSCHE CONSTRUCTION, INC.
Contractor

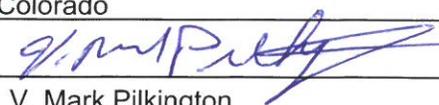
ADDENDUM NO. 1

DATE: 8/10/17

Signature of Bidder:

If an Individual: _____ doing business
as _____.

If a Partnership: _____
by: _____ General Partner.

If a Corporation: Krische Construction, Inc.
a Colorado Corporation,
by: , its President.
V. Mark Pilkington

Attest:

Secretary, Krista Toepfer (Corporate Seal)

If a Joint Venture, signature of all Joint Venture participants.

Firm: N/A

Corporation (), Partnership () or () Limited Liability Company

By: _____ (If a Corporation)
Attest: _____
Title: _____ Secretary (Corporate Seal)

Firm: _____

Corporation (), Partnership () or () Limited Liability Company

By: _____ (If a Corporation)
Attest: _____
Title: _____ Secretary (Corporate Seal)

Firm: _____

Corporation (), Partnership () or () Limited Liability Company

By: _____ (If a Corporation)
Attest: _____
Title: _____ Secretary (Corporate Seal)



**COMMITMENT TO MWBE
PARTICIPATION**

*The undersigned has satisfied the MWBE participant requirements in the following manner
(Please check the appropriate box):*

The Bidder/Proposer is committed to the minimum 4 % **MWBE** utilization on the project, and will submit Letters of Intent (LOI) for each subcontractor/subconsultant listed in the Bid Forms as follows:
Hard Bids: Three (3) business days after the bid opening.
Request for Proposals/Qualifications: With the proposal when due.
Compliance Plans: With each task/work order

The Bidder/Proposer is unable to meet the project goal of _____% **MWBE**, but is committed to a minimum of _____% **MWBE** utilization on the project. The Bidder/Proposer understands that they must submit a detailed statement of their good faith effort under sealed bid procedures, as a matter of responsiveness, or with initial proposals, under contract negotiation procedures; or no later than **three (3)** days after bid opening as a matter of responsibility as in accordance with DRMC Section 28-62 and 28-67 of Ordinance 85 to the Division of Small Business Opportunity.

The Bidder/Proposer is a certified **MWBE** in good standing with the City and is committed to self-perform a minimum of _____% of the work on the contract.

Bidder/Proposer (Name of Firm): Krische Construction, Inc.

Firm's Representative (Please print): V. Mark Pilkington

Signature (Firm's Representative): 

Title: President

Address: 605 Weaver Park Road

City: Longmont

State: CO

Zip: 80501

Phone: 303-776-7643

Fax: 303-776-9598

Email: vmpilk@krischeconstruction.com

A copy of the MWBE Certification letter must be attached to each Letter of Intent (LOI).



Office of Economic Development
 Division of Small Business Opportunity
 Compliance Unit
 201 West Colfax Ave., Dept. 907
 Denver, CO 80202
 Phone: 720-413-1000

LETTER OF INTENT (LOI)
INSTRUCTIONS FOR COMPLETION & SUBMISSION:

- All lines must be completed or marked N/A for Not Applicable
- Certification Letter must be submitted with LOI
- Submit the attached completed checklist with this letter
- Email to dobo@denvergov.org,
- FOR RFPs and RFQs: LOIs should be included with Submittal

Contract No.: 201735948		Project Name: Cranmer Park Sun Dial Terrace Reno	
A. The Following Section is To Be Completed by the Bidder/Consultant This Letter of Intent Must be Signed by the Bidder/Consultant and M/WBE, SBE, EBE or DBE			
Name of Bidder/Consultant: Krische Construction, Inc.		Self-Performing: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Phone: 303-776-7643
Contact Person: Mark Pilkington	Email: vmplik@krischeconstruction.com	Fax: 303-776-9598	
Address: 605 Weaver Park Rd	City: Longmont	State: CO	Zip: 80501
B. The Following Section is To Be Completed by the M/WBE, SBE, EBE or DBE, at any Tier This Letter of Intent Must be Signed by the M/WBE, SBE, EBE or DBE and Bidder/Consultant			
Name of Certified Firm: Building Restoration Specialists, Inc.		Phone: 303-776-7643	
Contact Person: Rhonda Maas	Email: rmaas@brsrestores.com	Fax: 303-296-2840	
Address: 3060 Walnut Street	City: Denver	State: CO	Zip: 80205
Please check the designation which applies to the certified firm.	M/WBE <input checked="" type="checkbox"/>	SBE <input checked="" type="checkbox"/>	EBE <input type="checkbox"/>
			DBE <input type="checkbox"/>
Indirect Utilization: If this M/WBE, SBE, EBE or DBE is not a direct first tier subcontractor/subconsultant, supplier or broker to the Bidder/Consultant, please indicate the name of the subcontractor/subconsultant, supplier or broker which is utilizing the participation of this firm:			
A Copy of the M/WBE, SBE, EBE or DBE Letter of Certification must be Attached			
Identify the scope of the work to be performed or supply item that will be provided by the M/WBE/SBE/DBE. <u>On unit price bids only.</u> Identify which bid line items the M/WBE/SBE/EBE/DBE's scope of work or supply corresponds to.			
Masonry, Pavers, Veneer, Salvage			
Subcontractor/Subconsultant <input checked="" type="checkbox"/>		Supplier <input type="checkbox"/>	
		Broker <input type="checkbox"/>	
Bidder intends to utilize the aforementioned M/WBE, SBE, EBE or DBE for the Work/Supply described above. The cost of the work and percentage of the total subcontractor M/WBE, SBE, EBE or DBE bid amount is:			
\$ 779,609.00		%	
Consultant intends to utilize the aforementioned M/WBE, SBE, EBE or DBE for the Work/Supply described above. The percentage of the work of the total subconsultant M/WBE, SBE, EBE or DBE will perform is:			
		40 %	
If the fee amount of the work to be performed is requested, the fee amount, is:			
		\$	
Bidder/Consultant's Signature: <i>Wendy Pith...</i>		Date: 8-14-17	
Title: President - Krische Construction, Inc.			
M/WBE, SBE, EBE or DBE or Self-Performing Firm's Signature: <i>Rhonda Maas</i>		Date: 8/10/17	
Title: Owner - Building Restoration Specialists, Inc.			
If the above named Bidder/Consultant is not determined to be the successful Bidder/Consultant, this Letter of Intent shall be null and void.			

Letter of Intent (LOI) Checklist

*All lines must be completed or marked N/A for Not Applicable
Submit the attached completed checklist with this letter.*

Completed ✓	
<input type="checkbox"/>	Project Number & Project Name
<input type="checkbox"/>	Section A: Name of Bidder/Consultant, Contact Person, Address, City, State, Zip, Phone, Email
<input type="checkbox"/>	Section B: Name of Certified Firm, Contact Person, Address, City, State, Zip, Phone, Email
<input type="checkbox"/>	Designation checked for MBE/WBE, SBE, EBE or DBE
<input type="checkbox"/>	Indirect Utilization: Name of subcontractor/subconsultant, supplier or broker is indicated if using the participation of a 2 nd tier subcontractor/subconsultant, supplier or broker.
<input type="checkbox"/>	Scope of work performed or item supplied by MWBE, SBE, EBE or DBE
<input type="checkbox"/>	Line items performed, if line-item bid.
<input type="checkbox"/>	Copy of MWBE, SBE, EBE or DBE Letter of Certification Attached
<input type="checkbox"/>	Designation checked for Subcontractor/Subconsultant, Supplier or Broker
	If project is a hard bid...
<input type="checkbox"/>	Bidder has indicated dollar amount for value of work going to Subcontractor/ Subconsultant, Supplier or Broker
<input type="checkbox"/>	Bidder has indicated percentage for value of work going to Subcontractor/ Subconsultant, Supplier or Broker
	If project is an RFP/RFQ...
<input type="checkbox"/>	Consultant has indicated percentage for value of work going to Subcontractor/ Subconsultant, Supplier or Broker Name & contact name for MWBE.
<input type="checkbox"/>	Fee amount if fee amount of work to be performed is requested.
<input type="checkbox"/>	Bidder/Consultant's Signature, Title & Date
<input type="checkbox"/>	M/WBE, SBE, EBE or DBE Firm's Signature, Title and Date

Select One ✓	SUBMITTED VIA... For Construction Hard Bids ONLY, Bidders are strongly urged to deliver the LOI via one of the methods below. (The preferred method is to scan/email completed forms to email address below. Delivery to any other point cannot be guaranteed timely delivery.)
<input type="checkbox"/>	Email to DSBO@denvergov.org

The complete and accurate information that is required for the Letter of Intent is based on the following sections of the Ordinance 85: Section 28-63 and Section 28-68. Failure to complete this information on the Letter of Intent (LOI) may automatically deem a bid or proposal non-responsive.



Joint Venture Affidavit

The Undersigned swears that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the Undersigned covenant and agree to provide the City current, complete, and accurate information regarding actual joint venture work and the payment thereof and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records, and files of the joint venture, by authorized representatives of the City or Federal funding agency, if applicable. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements.

Name of Firm: _____	
Print Name: _____	Title _____
Signature: _____	Date: _____

Notary Public

County of _____	State of _____	My Commission Expires: _____
Subscribed and sworn before me this _____ day of _____, 20____		Notary Seal
Notary Signature: _____		
Notary Commission #: _____		
Address: _____		

Name of Firm: _____	
Print Name: _____	Title _____
Signature: _____	Date: _____

Notary Public

County of _____	State of _____	My Commission Expires: _____
Subscribed and sworn before me this _____ day of _____, 20____		Notary Seal
Notary Signature: _____		
Notary Commission #: _____		
Address: _____		



**JOINT VENTURE
ELIGIBILITY FORM**

Joint Venture means an association of two (2) or more business enterprises to constitute a single business enterprise to perform a City construction or professional design and construction services contract for which purpose they combine their property, capital, efforts, skills and knowledge, and in which each joint venturer is responsible for a distinct, clearly defined portion of the work of the contract, performs a commercially useful function, and whose share in the capital contribution, control, management responsibilities, risks and profits of the joint venture are equal to its ownership interest. Joint ventures must have an agreement in writing specifying the terms and conditions of the relationships between the joint venturers and their relationship and responsibility to the contract.

The Division of Small Business Opportunity (DSBO) requires the following information be provided from participants of a prospective joint venture, to assist DSBO in evaluating the proposed joint venture. This Joint Venture Eligibility form and the Joint Venture Affidavit apply if SBEs, EBEs, MBEs, WBEs or DBEs participate in this joint venture.

Please return this form, the Joint Venture Affidavit, and a copy of your Joint Venture Agreement to: Division of Small Business Opportunity, 201 West Colfax Avenue, Denver, CO 80202, at least **ten (10) working days** prior to bid opening or proposal.

If you have questions regarding this process, please contact DSBO at 720-913-1999.

Joint Venture Information

Name:		Contact Person:	
Address:			
City:	State:	Zip:	Phone:

Joint Venture Participants

Name:		Contact Person:	
Address:			
City:	State:	Zip:	Phone:
% Ownership:	Certifying Entity:	Type Certification & Date: (S/E/M/W or DBE)	
Type of Work for which Certification was granted:			

Name:		Contact Person:	
Address:			
City:	State:	Zip:	Phone:
% Ownership:	Certifying Entity:	Type Certification & Date: (S/E/M/W or DBE)	
Type of Work for which Certification was granted:			

General Information

SBE/EBE/MBE/WBE/DBE Initial Capital Contributions: \$	%
Future capital contributions (explain requirements) (attach additional sheets if necessary):	

Source of Funds for the SBE/EBE/MBE/WBE/DBE Capital Contributions:

Describe the portion of the work or elements of the business controlled by the SBE/EBE/MBE/WBE or DBE: (attach additional sheets if necessary)

Describe the portion of the work or elements of the business controlled by non-SBE/EBE/MBE/WBE or DBE: (attach additional sheets if necessary)

JOINT VENTURE ELIGIBILITY FORM

General information

Describe the SBE/EBE/MBE/WBE or DBE's involvement in the overall management of the joint venture (e.g., participation on a management committee or managing board voting rights, etc.) (attach additional sheets if necessary)

Describe the SBE/EBE/MBE/WBE or DBE's share in the profits of the joint venture:

Describe the SBE/EBE/MBE/WBE or DBE's share in the risks of the joint venture:

Describe the roles and responsibilities of each joint venture participant with respect to managing the joint venture (use additional sheets if necessary):

a. SBE/EBE/MBE/WBE or DBE joint venture participant:

b. Non- SBE/EBE/MBE/WBE or DBE joint venture participant:

Describe the roles and responsibilities of each joint venture participant with respect to operation of the joint venture (use additional sheets if necessary):

a. SBE/EBE/MBE/WBE or DBE joint venture participant:

b. Non- SBE/EBE/MBE/WBE or DBE joint venture participant:

Which firm will be responsible for accounting functions relative to the joint venture's business?

Explain what authority each party will have to commit or obligate the other to insurance and bonding companies, financing institutions, suppliers, subcontractors, and/or other parties?

Please provide information relating to the approximate **number** of management, administrative, support and non-management employees that will be required to operate the business and indicate whether they will be employees of the S/E/MWBE/DBE, non- S/E/MWBE/DBE or joint venture:

	Non- SBE/EBE/MWBE/DBE	SBE/EBE/MWBE/DBE	Joint Venture
Management			
Administrative			
Support			
Hourly Employees			

JOINT VENTURE ELIGIBILITY FORM

General Information

Please provide the name of the person who will be responsible for hiring employees for the joint venture.

Who will they be employed by?

Are any of the proposed joint venture employees currently employees of any of the joint venture partners? Yes (✓) No (✓)

If yes, please list the number and positions and indicate which firm currently employs the individual(s), (use additional sheets if necessary)

Number of employees	Position	Employed By

Attach a copy of the proposed joint venture agreement, promissory note or loan agreement (if applicable), and any and all written agreements between the joint venture partners.

List all other business relationships between the joint venture participants, including other joint venture agreements in which the parties are jointly involved.

If there are any significant changes in or pertaining to this submittal, the joint venture members must immediately notify the Division of Small Business Opportunity.

COMP-FRM-015

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS**

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT Krische Construction, Inc., 605 Weaver Park Road, Longmont, CO 80501, as Principal, and Hartford Fire Insurance Company, a corporation organized and existing under and by virtue of the laws of the State of CT, and authorized to do business within the State of Colorado, as Surety, are held and firmly bound unto the City and County of Denver, Colorado, as Obligee, in full and just sum of Five Percent of the Total Amount Bid Dollars, (\$ ---- 5% ----), lawful money of the United States, for the payment of which 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, the said Principal is herewith submitting its bid, dated August 10, 2017, for the construction of: **Contract No. 201735948, CRANMER PARK SUN DIAL TERRACE RENOVATION**, as set forth in detail in the Contract Documents for the City and County of Denver, Colorado, and said Obligee has required as a condition for receiving said bid that the Principal deposit specified bid security in the amount of not less than five percent (5%) of the amount of said bid, as it relates to work to be performed for the City, conditioned that in event of failure of the Principal to execute the Contract, for such construction and furnish required Performance and Payment Bond if the contract is offered him that said sum be paid immediately to the Obligee as liquidated damages, and not as a penalty, for the Principal's failure to perform.

The condition of this obligation is such that if the aforesaid Principal shall, within the period specified therefore, on the prescribed form presented to him for signature, enter into a written contract with the Obligee in accordance with his bid as accepted and give Performance and Payment Bond with good and sufficient surety or sureties, upon the form prescribed by the Obligee, for the faithful performance and the proper fulfillment of said Contract, or in the event of withdrawal of said bid within the time specified, or upon the payment to the Obligee of the sum determined upon herein, as liquidated damages and not as penalty, in the event the Principal fails to enter into said contract and give such Performance and Payment Bond within the time specified, then this Obligation shall be null and void, otherwise to remain in full force and effect.

Signed, sealed and delivered this 10th day of August, 2017.

~~XXXXXX~~

Witness:

By:

~~Secretary~~ Witness

Krische Construction, Inc.

Principal

By

Title V. Mark Pilkington, President

Hartford Fire Insurance Company

Surety

By

Brandi J. Tetley, Attorney-in-Fact

[SEAL]

Seal if Bidder is Corporation
(Attach Power-of-Attorney)



1705 17th Street, Suite 100
Denver, CO 80202
Phone 303.534.4567

POWER OF ATTORNEY

Direct Inquiries/Claims to:

THE HARTFORD

Bond T-4

One Hartford Plaza

Hartford, Connecticut 06155

call: 888-266-3488 or fax: 860-757-5835

KNOW ALL PERSONS BY THESE PRESENTS THAT:

Agency Code: 34-340140

- Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, **up to the amount of** Unlimited :

Jennifer L. Clampert, Robert L. Cohen, Sarah Finn, Bradley J. Jeffress, Michael Lischer Jr., Nicole L. McCollam, Kristen L. McCormick, Robert J. Reiter, Sheryll Shaw, Brandi J. Tetley, Sue Wood of DENVER, Colorado

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by , and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on August 1, 2009, the Companies have caused these presents to be signed by its Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.



Wesley W. Cowling

Wesley W. Cowling, Assistant Secretary

M. Ross Fisher

M. Ross Fisher, Vice President

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } ss. Hartford

On this 12th day of July, 2012, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.



CERTIFICATE

Kathleen T. Maynard

Kathleen T. Maynard
Notary Public

My Commission Expires July 31, 2016

I, the undersigned, Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of August 10th, 2017.
Signed and sealed at the City of Hartford.



Gary W. Stumper

Gary W. Stumper, Vice President



Office of Economic Development
 Division of Small Business Opportunity
 201 W. Colfax Ave, Dept. 907
 Denver, CO 80202
 p: 720.913.1999
 f: 720.913.1809
www.denvergov.org/dsbo

Diversity and Inclusiveness * in City Solicitations Information Request Form

Type in your response, print out, sign and date; or print out and complete manually. Please print legibly.

Denver Executive Order No. 101 establishes strategies between the City and private industry to use diversity and inclusiveness to promote economic development in the City and County of Denver and to encourage more businesses to compete for City contracts and procurements. The Executive Order requires, among other things, the collection of certain information regarding the practices of the City's contractors and consultants toward diversity and inclusiveness and encourages/requires City agencies to include diversity and inclusiveness policies in selection criteria where legally permitted in solicitations for City services or goods.

Answer each question below. Missing or incomplete responses will be recorded as "no", "not applicable", or "none". **A proposal or response to a solicitation by a contractor/consultant that does not include this completed form shall be deemed non-responsive and rejected.**

Business Email Address: info@krischeconstruction.com

Please include the Email address of the contact person facilitating this solicitation for the City and County of Denver: vmpilk@krischeconstruction.com

Agency Name:

- | | | |
|---|--|--|
| <input type="checkbox"/> Arts and Venue | <input type="checkbox"/> Purchasing Division | <input type="checkbox"/> Sheriff Department |
| <input type="checkbox"/> Auditor Office | <input type="checkbox"/> Human Services | <input type="checkbox"/> Technology Services |
| <input type="checkbox"/> Community Planning | <input type="checkbox"/> Economic Development | <input type="checkbox"/> Other |
| <input type="checkbox"/> Denver International Airport | <input type="checkbox"/> Parks and Recreation | |
| <input type="checkbox"/> Environmental Health | <input type="checkbox"/> Police Department | |
| <input type="checkbox"/> Fire Department | <input checked="" type="checkbox"/> Public Works | |

Project Name: Sundial Terrace at Cranmer Park

BID / RFP No.: 2017359498

Name of Contractor/Consultant: Krische Construction, Inc.

What industry is your business? General Contractor

Address:
605 Weaver Park Road
Longmont, CO 80501

Business Phone No.: 303-776-7643

Business Facsimile No.: 303-776-9598

OED - Executive Order No. 101
 Diversity and Inclusiveness in City Solicitations Information Request Form
 Rev. 12/29/2015

1. How many employees does your company employ?

- 1-10 51-100
 11-50 over 100

1.1. How many of your company's employees are:

Full-time 30 Part-Time _____

2. Do you have a Diversity and Inclusiveness Program? Yes No

If No, and your company size is less than 10 employees continue to question 11. Complete and sign the form.

If Yes, does it address:

- 2.1 Employment and retention? Yes No
2.2 Procurement and supply chain activities? Yes No
2.3 Customer service? Yes No

3. Provide a detailed narrative of your company's diversity and inclusiveness principles and programs. This may include, for example, (i) diversity and inclusiveness employee training programs, equal opportunity policies, and the budget amount spent on an annual basis for workplace diversity; or (ii) diversity and inclusiveness training and information to improve customer service.

Equal Opportunity Policy included in the Employee Handbook is given to every employee at time of hire. Annual Budget is undisclosed.

4. Does your company regularly communicate its diversity and inclusiveness policies to employees?

If Yes, how does your company regularly communicate its diversity and Inclusiveness policies to employees? (select all that apply)

- Employee Training
 Pamphlets
 Public EEO postings
 Other
 Not Applicable

5. If you responded that you do not have a diversity and inclusiveness program, describe any plans your company may have to adopt such a program.

6. How often do you provide training in diversity and inclusiveness principles?

- Monthly Annually
 Quarterly Not Applicable Other at time of hire

6.1 What percentage of the total number of employees generally participate?

- 0 - 25% 51 - 75%
 26 - 50% 76 - 100% Not Applicable

7. State how you achieve diversity and inclusiveness in supply and procurement activities. This may include, for example, narratives of training programs, equal opportunity policies, diversity or inclusiveness partnership programs, mentoring and outreach programs, and the amount and description of budget spent on an annual basis for procurement and supplier diversity and inclusiveness.

Reach out to diverse subcontractors and strongly encourage participation in bidding projects.

8. Do you have a diversity and inclusiveness committee? Yes No

8.1 If Yes, how often does it meet?

- Monthly Annually No Committee
 Quarterly Other _____

8.2 If you responded that you do not have a diversity and inclusiveness committee, describe any plans your company may have to establish such a committee.

Make assignments to appropriate employees as contracts require.

9. Do you have a budget for diversity and inclusiveness efforts? Yes No
10. Does your company integrate diversity and inclusion competencies into executive/manager performance evaluation plans? Yes No
11. Would you like information detailing how to implement a Diversity and Inclusiveness program? Yes No

If yes, please email XO101@denvergov.org.

I attest that the information represented herein is true, correct and complete, to the best of my knowledge.



Signature of Person Completing Form

Aug 10, 2017

Date

V Mark Pilkington

Printed Name of Person Completing Form

NOTE: Attach additional sheets or documentation as necessary for a complete response.

*"Diversity and inclusiveness program" means a program that invites values, perspectives and contributions of people from diverse backgrounds, and integrates diversity into its hiring and retention policies, training opportunities, and business development methods to provide an equal opportunity for each person to participate, contribute, and succeed within the organization's workplace. "Diversity" encompasses a wide variety of human differences, including differences such as race, age, gender, gender identity, sexual orientation, ethnicity, physical disabilities, appearance, historically underutilized and disadvantaged persons, as well as social identities such as religion, marital status, socio-economic status, lifestyle, education, parental status, geographic background, language ability, and veteran status."

CITY AND COUNTY OF DENVER
STATE OF COLORADO



Department of Public Works
Bid Documents

Contract No: 201735948



Cranmer Park Sun Dial Terrace Renovation

July 17, 2017

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management

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DENVER
THE MILE HIGH CITY
CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity	
02 40 00-1	Mobilization @ 5%	1	LS
02 40 00-2	Erosion and sediment control silt fence	1	LS
02 40 00-3	Erosion and sediment control curb line protection	1	LS
02 40 00-4	Erosion and sediment control vehicle tracking control pad	1	LS
02 40 00-5	Erosion and sediment control concrete washout containment	1	LS
02 40 00-6	6" Temporary chain link construction fence	1	LS
02 40 00-7	Construction surveying	1	LS
02 41 00-1	Stone pavers, mortar setting bed and concrete slab	1	LS
02 41 00-2	Perimeter walls stone veneer, concrete stem/footer removal	1	LS
02 41 00-3	Perimeter steps concrete stem and footer removal	1	LS
02 41 00-4	Utility vault electrical service termination	1	LS
02 41 00-5	Utility vault sanitary service termination	1	LS
02 41 00-6	Utility vault entry walls, slab, door and frame removal	1	LS
02 41 00-7	Utility vault wall bracing	1	LS
02 41 00-8	Utility vault saw cut and remove upper walls	1	LS
02 41 00-9	Utility vault roof removal	1	LS
02 41 00-10	Utility vault import, place and compact structural fill	1	LS
03 30 00-1	Structural concrete wall and step section footers	1	LS

STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity	
03 30 00-2	Structural concrete pivot slab	1	LS
03 30 00-3	Structural concrete sundial foundation	1	LS
03 30 00-4	Structural concrete accessible ramp	1	LS
31 11 00-1	Evergreen shrub mass removal	1	LS
31 11 00-2	Turf grass removal (including top 2" of soil)	1	LS
31 20 00-1	Cut disposed of off site	1	LS
31 20 00-2	Import, place and compact structural fill	1	LS
32 12 16-1	Asphalt saw cut	1	LS
32 12 16-2	Asphalt pavement removal	1	LS
32 12 16-3	Asphalt pavement replacement with base course	1	LS
32 12 16-4	Parking blocks	1	LS
32 12 16-5	Pavement marking	1	LS
32 13 13 -1	Concrete pavement	1	LS
32 13 13-2	Concrete curb and gutter	1	LS
32 13 13-3	Concrete curb	1	LS
32 80 00-1	Irrigation system reconfiguration and replacement	1	LS
32 91 20-1	Import, place, shape and compact pre-amended topsoil	1	LS
32 92 23-1	Scarify, rough and fine grade surface to receive new sod	1	LS
32 92 23-2	New sod installation	1	LS

STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity	
33 46 00-1	Drainage pipe	1	LS
33 46 00-2	Buried clean outs	1	LS
33 46 00-3	Day light rodent screen	1	LS
33 46 00-4	Sand leveling bed	1	LS
33 46 00-5	Crushed rock stabilizer bed	1	LS
33 46 00-6	Geotextile filter fabric	1	LS
33 46 00-7	Washed river rock drainage medium	1	LS
33 47 00-1	Existing panorama documentation	1	LS
33 47 00-2	Stone inset salvage, cleaning and storage	1	LS
33 47 00-3	Stone inset reinstallation	1	LS
33 47 00-4	Rustic terrazzo installation	1	LS
33 48 00-1	Upper terrace ashlar pattern dry set sand stone pavers	1	LS
33 48 00-2	Lower terrace random pattern dry set sand stone pavers	1	LS
33 48 00-3	Dry set grade transition step blocks	1	LS
44 41 00-1	Crane rental (six operations)	1	LS
44 41 00-2	Hauling (three operations)	1	LS
44 41 00-3	Refacing surface of sundial	1	LS
44 41 00-4	Recutting text and line work	1	LS
44 41 00-5	Resetting	1	LS

STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity	
44 42 00-1	Existing text and line work documentation	1	LS
44 42 00-2	Steel finished rose red granite replacement	1	LS
44 42 00-3	Hauling loading and resetting	1	LS
44 42 00-4	Replace two broken terrazzo marker stones	1	LS
44 42 00-5	Remove, store and reset park ID stone	1	LS
44 42 00-6	Cut directional arrows in reset caps	1	LS
44 42 20-1	Four inch square sand stone place holder blocks	1	LS
44 42 20-2	Concrete curb	1	LS
44 42 20-3	Sand setting bed	1	LS
44 42 20-4	Drainage rock	1	LS
44 42 40-1	Salvage, store and reinstall existing sign	1	LS
44 42 40-2	New trash receptacle	1	LS
44 42 40-3	Salvage, store and reinstall existing bench w/ plaque	1	LS
44 42 40-4	Salvage, store and reinstall dog waste bag dispenser	1	LS
44 42 60-1	Assessable ramp hand rail with embed plates	1	LS
44 42 60-2	Interpretative sign post and footer installation	1	LS
44 42 80-1	Sandstone veneer	1	LS
44 42 80-2	Salvage, store and clean step and cap stones	1	LS
44 42 80-3	Reinstall step and cap stones	1	LS

75 ITEMS



STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity
----------	-------------	--------------------

**ADD ALT #1
Drinking Fountain**

ITEM	DESCRIPTION		unitshort
44 42 90-1	Drinking fountain removal and delivery	1	LS
44 42 90-2	Memorial ring removal, storage and reinstallation	1	LS
44 42 90-3	Point of connection	1	LS
44 42 90-4	Service line with asphalt patch	1	LS
44 42 90-5	Stop and waste valve	1	LS
44 42 90-6	Barrier free fountain	1	LS
44 42 90-7	Waste piping	1	LS
44 42 90-8	Drain sump with lid, ring, cover and rock	1	LS
44 42 90-9	Landscape restoration	1	LS

**ADD ALT #2
Stone Paver Salvage**

ITEM	DESCRIPTION		unitshort
44 41 00-1	Upper terrace select stone salvage and palletize	1	LS

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management

NOTICE FOR INVITATION FOR BIDS
FOR CONTRACT #201735948

CRANMER PARK SUN DIAL TERRACE RENOVATION

BID SCHEDULE:
11:00 a.m., Local Time
August 10, 2017

Sealed bids will be received in Room 6.G.7, 201 W. Colfax Ave., Denver, CO 80202, beginning at 10:30 a.m., no later than 11:00 a.m., on bid day. All properly delivered bids will then be publicly opened and read aloud.

CONTRACTOR QUALIFICATION REQUIREMENT:

Bids will only be accepted from Contractors who were qualified during Stage 1 of the RFQ/Bid process issued on May 8, 2017. To view the Qualified Contractors List for this project please visit: www.work4denver.com.

Bids submitted prior to 10:30 a.m. on the specified bid opening date/time shall be presented at the Office of Contract Administration, Attention: Public Works Contract Administration, 201 W. Colfax Ave., Department 614, Denver, CO 80202.

Prior to submitting a bid, the bidder shall consult the Contractor's Bulletin Board located at 201 W. Colfax Ave., 2nd Floor, Denver, CO 80202 and/or www.work4denver.com.

GENERAL STATEMENT OF WORK:

This project will include the restoration and reconstruction of the Sundial Terrace at Cranmer Park. The scope includes removal, disposal and replacement of the existing sandstone terrace, perimeter retaining and wing walls, and subgrade material. The utility vault, water service, sanitary service, electrical service and storm sewer will also be removed. The existing sundial will be repaired and reset on a stabilized concrete footer base, perimeter cap and step stones will be salvaged, stored and reinstalled, and a universally accessible ramp will be installed.

ESTIMATED CONSTRUCTION COST:

The estimated cost of construction for this project is between \$1,185,381.00 and \$1,448,799.00.

TEXTURA CONSTRUCTION PAYMENT MANAGEMENT:

Bidders are required, when preparing a bid, to agree that it shall use the Textura® Construction Payment Management System (CPM System) for this Project and recognizes that all fees associated with the CPM System are to be paid by the awarded Contractor for billings for work performed. Use the pricing scale provided in Instructions to Bidders to price the Textura service appropriately. For details on the company and service contact the Textura® Corporation 866-TEXTURA or www.texturacorp.com.

DOCUMENTS AND BID INFORMATION AVAILABLE:

Contract Documents complete with Technical Specifications and, if applicable, construction drawings will be available on the first day of publication at: www.work4denver.com. To download digital Contract Documents at a cost of \$10.00 per download, reference eBid Document Number #5249719. Contact QuestCDN at 952-233-1632 or info@questcdn.com for assistance.

PRE-BID CONFERENCE:

A pre-bid conference will be held for this Project at 9:00 a.m., local time, on July 26, 2017. This meeting will take place at the WEBB Building, 201 W Colfax Avenue, 4th floor conference room 4.I.4., Denver, CO 80202. Immediately following the meeting, we will meet at Cranmer Park for a walk through, 4501 E 1st Avenue, at the Sun Dial Terrace.

DEADLINE TO SUBMIT QUESTIONS: August 2, 2017 at 2:00 p.m. local time.

PREQUALIFICATION REQUIREMENTS:

Each bidder must be prequalified as 2A General Building in the \$1,500,000.00 monetary level in accordance with the City's Rules and Regulations Governing Prequalification of Contractors. Each bidder must have submitted a prequalification application a minimum of ten (10) calendar days prior to the bid opening date. Applications must be submitted to the Department of Public Works, Prequalification Section, 201 W. Colfax Ave., Department 614, Denver, CO 80202. To view the Rules and Regulations and to obtain a prequalification application, please visit our website at www.denvergov.org/prequalification or call 720-865-2539 for prequalification information ONLY.

MINORITY AND WOMAN BUSINESS ENTERPRISE PARTICIPATION:

Construction, reconstruction and remodeling contracts made and entered into by the City and County of Denver are subject to Article III, Divisions 1 and 3 of Chapter 28 of the Denver Revised Municipal Code, (Sections 28-31 to 28-36 and 28-52 to 28-90 D.R.M.C) and all Minority and Woman Business Enterprise and Equal Employment Opportunity Rules and Regulations adopted by the Director of the Division of Small Business Opportunity.

Article III, Division 3 of Chapter 28 of the D.R.M.C. directs the Director of the Division of Small Business Opportunity to establish a project goal for expenditures on construction, reconstruction, and remodeling work contracted by the City and County of Denver. The specific goal for this project is:

4% Minority and Woman Business Enterprise (M/WBE) Participation

Project goals must be met with certified participants as set forth in Section 28-60, D.R.M.C. or through the demonstration of a sufficient good faith effort under Section 28-62 D.R.M.C. For compliance with good faith requirements under Section 28-62(b), **the M/WBE percentage solicitation level required for this project is 100%.**

The Director of the Division of Small Business Opportunity urges all participants in City construction, reconstruction and remodeling projects to assist in achieving these goals.

MISCELLANEOUS:

Contracts for construction, reconstruction, and remodeling are subject to the City prevailing wage rate requirements established pursuant to Section 20-76, D.R.M.C.

As its best interest may appear, the City and County of Denver reserves the right to reject any or all bids and to waive informalities in bids.

A modified version of this Notice of Invitation for Bids and the project's Statement of Quantities is available on the City and County of Denver's website at: www.work4denver.com.

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CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management

INSTRUCTIONS TO BIDDERS

IB-1 INSTRUCTION TO BIDDERS

These Instructions to Bidders are a part of the Contract Documents and are intended to serve as a guide to bidders. They are general in nature and may be amended or supplemented as needed to support any one specific invitation to bid. Each bidder shall prepare its bid in strict compliance with all requirements of the Contract Documents and by careful application of these instructions.

IB-2 BIDDING

The copy of the Contract Documents contains the Bid Form and Submittal Package for this Project, which must be used to submit a bid hereunder. The bidder must fully complete, execute and submit this Bid Form and Submittal Package, along with any other specified components of the Contract Documents, as its bid for the referenced Project.

A bidder is not required to submit as part of its bid the entire set of Contract Documents distributed by the City pursuant to the Notice of Invitation for Bids, if the bidder executes and submits the Bidder Acknowledgment Form included with the Bid Form and Submittal Package as part of its bid. However, each bidder, by submitting its bid, shall be conclusively presumed to have received and reviewed all of the information contained in the Contract Documents as this term is further defined herein.

Each bid must be enclosed in a sealed envelope, must be addressed to the Manager and must show on the face of the envelope the full name of the bidder, the City Project number, and descriptive title of the Project for which the bid is made.

The advertisement for Notice of Invitation for Bids will identify where and when the bid must be delivered.

IB-3 CONTRACT DOCUMENTS AS PUBLISHED BY CITY

Each bidder shall be responsible for, and shall be deemed to have received, all the information contained in the Contract Documents as distributed by the City pursuant to the Notice of Invitation for Bids, including addenda, whether or not such bidder has reviewed all or part of the Contract Documents in either its hard copy form or in any other format. If organizations or companies other than the City or its design professional distribute the City's Contract Documents for review by prospective bidders, whether in hard copy or via electronic or other media, neither the City nor its design professional shall be responsible for the content, completeness or accuracy of any information distributed or transmitted by any such organization or company.

IB-4 COMPLETING AND SIGNING THE BID FORMS

The bidder must complete the Bid Form by legibly writing or printing in ink, in words and figures as required, all the bidder's prices offered for the Work to be performed. All blank spaces, which require a response of the bidder, must be properly completed in full. If in the process of evaluating a bid, words and figures, as written on the Bid Form by the bidder, do not agree, the written words will govern.

For Bid Forms requiring unit price bids, the bidder shall write in the Bid Form spaces provided a unit price for each item for which a quantity is given and shall also write the product of each unit price and the quantity specified in the "Amount" or "Total" space provided.

Each bidder must sign the Bid Form and give the bidder's current business address. If an individual, the signature must be of the individual offering the bid; if a partnership, the signature must be that of a general partner; and if a corporation, both the president and the secretary must sign and the seal of the corporation must be affixed. Signatures of other persons may be acceptable if the bid contains sufficient evidence, satisfactory to the City in its sole discretion, to indicate that the other persons are authorized to bind the bidder.

IB-5 UNACCEPTABLE BIDS

The City will not accept bids from Bidders not prequalified with the Department of Public Works (if prequalification is required for this project), in arrears to the City upon debt or contract, or which are defaulters (as surety or otherwise) upon any obligation to the City.

IB-6 INFORMAL AND UNBALANCED BIDS

Any alteration, interlineations, erasure, omission, deletion or addition by the bidder to the Bid Form and Submittal Package or other parts of the Contract Documents submitted with the Bid Form and Submittal Package, as originally issued to the bidder, shall render the accompanying bid informal and may constitute cause for rejection.

Any unauthorized addition, conditional or alternate bids, failure to provide a unit price, lump sum amount or authorized alternate item specified or other irregularities of any kind which tend to render the bid incomplete, indefinite or ambiguous shall render the bid informal and may constitute cause for rejection.

Bids that are unbalanced so that each item does not reasonably carry its own proportion of cost or that contain inadequate or unreasonable prices for any item may be rejected. Bids, which have not acknowledged all addenda to the Contract Documents issued for this bid, may also be rejected.

The right is reserved by the City to reject any or all bids and to waive any informalities where it is deemed by the City to be in the best interests of the City to do so.

IB-7 ONLY ONE BID ACCEPTED

The City will accept only one bid for the same work from any one bidder. This includes bids that may be submitted under different names by one business enterprise.

IB-8 BID GUARANTEE

As a guarantee of good faith on the part of the bidder, each bid must be accompanied by a bid guarantee, consisting of either a certified or cashier's check made payable without condition to the order of the City and County of Denver or a bid bond written by an approved corporate surety in favor of the City and County of Denver. If the bid of a bidder is acceptable and the bidder is notified by the Manager that it is considered to be the Apparent Low Bidder and said bidder fails to execute a contract in the form prescribed or to furnish a performance and payment bond with a legally responsible and approved surety or to furnish the required evidence of insurance or satisfy all conditions precedent to contract execution within five (5) days after such notice is made by the City, said bid guarantee shall be forfeited to the City as liquidated damages and not as a penalty.

The bid guarantee shall be in the amount of five percent (5%) of the total bid unless otherwise specified in the Notice of Invitation for Bids and on the form appearing in the Contract Documents in the Bid Form and Submittal Package. Failure to submit a properly executed bid guarantee, on the form provided herein may, in the City's sole discretion, constitute cause for rejection.

Following award and execution of the Contract by the Apparent Low Bidder, or earlier in the sole discretion of the City, bid guarantees of all but the Apparent Low Bidder will be returned. When the Apparent Low Bidder executes the Contract and delivers to the City satisfactory performance and payment bonds, required insurance documentation, and has satisfied all conditions precedent to contract execution by the City, and after approval, if any, by the Council of the City of the proposed Contract with the Apparent Low Bidder, the bid guarantee of the Apparent Low Bidder shall be returned. Such return shall be made within one hundred twenty (120) days from date bids are opened unless otherwise specified in the Special Contract Conditions.

IB-9 SITE INSPECTION AND INVESTIGATIONS

Prior to submitting a bid, the bidder is invited to inspect the work site and its surroundings. Although the bidder is not required to make such an inspection before bidding, for purposes of the Contract it shall be conclusively presumed that by failing to make such an inspection, the bidder has waived the right to later claim additional compensation or time extensions for conditions which would have been evident had the site been inspected.

Drawings and Technical Specifications, defining the Work to be done, were prepared on the basis of interpretation by the design professionals of information derived from investigations of the work site. Such information and data are subject to sampling errors, and the interpretation of the information and data depends to a degree on the judgment of the design professional. In view of this, the bidder is invited to make such additional investigations as the bidder's judgment dictates the need for such investigations. Information about the degree of difficulty of the Work to be done cannot totally be derived from either the Drawings or Technical Specifications or from the Manager or his representatives.

Since the bid information cannot be guaranteed, the Contractor shall have assumed the risks attendant to successful performance of the Work and shall never make claim for additional compensation or time extensions on the grounds that the nature or amount of work to be done was not understood by the bidder at the time of the bidding.

IB-10 INCONSISTENCIES

Any seeming inconsistencies or ambiguities between different provisions of the Contract Documents or any point which the bidder believes requires a decision or interpretation by the City must be inquired into by the bidder by addressing a formal written communication to the Manager of Public Works and sending or delivering it to the offices of the Division of Public Works advertising this Project for bid at least forty-eight (48) hours, excluding Saturdays, Sundays, and holidays, before the time set for the opening of bids

Information about the decision or interpretation made in response to any inquiry will be posted on the Contractor's Bulletin Board (refer to IB-12 CONTRACTOR'S BULLETIN BOARD, for the location of the Contractor's Bulletin Board). If the matter raised requires, in the sole discretion of the Manager, that an addendum to the bid documents be issued, such addendum will be published and each bidder shall be required to acknowledge the addendum by signing and identifying it in the Bid Form when submitting the bid.

After bids are opened, all bidders must abide by the formal response of the Manager, as to any interpretation. The City shall not be bound and the bidder shall not rely on any oral communication, interpretation clarification or determination of the Contract Documents prior to bid opening.

IB-11 WITHDRAWAL OF BID

A bidder may withdraw its bid at any time prior to the time for receipt of bids set forth in the Notice of Invitation for Bids by making written request upon the Manager of Public Works. After such time, no bid may be withdrawn or modified.

Such request must be signed by the persons authorized to bind the bidder as defined in IB-3, COMPLETING AND SIGNING BID FORMS.

IB-12 CONTRACTOR'S BULLETIN BOARD

It shall be conclusively presumed that the bidder has, before submitting any bid, read and shall take full responsibility for all addenda, posted decisions, and other information relevant to the bid posted by the City on the Contractor's Bulletin Board. The Contractor's Bulletin Board is located at 201 W. Colfax, 2nd Floor, Denver, CO 80202, in the Wellington E. Webb Municipal Office Building.

IB-13 PRE-BID MEETING

Bidders are urged to attend the pre-bid meeting(s) scheduled for this Project. Attendance is not mandatory; however, bidders will be held responsible for all information presented at such meeting(s).

IB-14 ADDENDA

As its best interests may require, the City may issue addenda to the Contract Documents. Such addenda shall be posted on the Contractor's Bulletin Board and made available to all persons having purchased a set of Contract Documents as set forth in the Notice of Invitation for Bids contained herein. All bidders must acknowledge receipt of all addenda on the Bid Form at the time of submission of the bid.

IB-15 BID OPENING

Bidders are invited to be present at the bid opening. Unless otherwise suspended, delayed or canceled by posted notice from the Manager, bid opening will occur at the time and place designated in the Notice of Invitation for Bid.

IB-16 EVALUATION OF BIDS AND BASIS OF BID SELECTION

Bids will be evaluated after being read in open meeting at the place designated for such bid opening. All low bidders' bids will be reviewed for responsiveness to the requirements of the Contract Documents and whether or not the bids contain irregularities which could give any bidder an unfair advantage.

Selection will be made on the basis of the lowest, total, responsive, qualified bid, which bid shall include the total base bid set forth on the Bid Form, plus the total of any alternates set forth on the Bid Form and selected by the City during evaluation. Alternates, if any are included in the bid, will be selected in the priority shown on the Bid Form, subject to the limits of available funds. Bid selection will be subject to all requirements and special bidder qualifications contained herein and subject to approval of such resulting Contract in accordance with the Charter and Revised Municipal Code of the City and County of Denver. In addition to all other specified requirements, the City will correct arithmetical errors in all bids and corrected totals only will be considered as the basis of selection.

Upon concluding that the bid is, in fact, the lowest, total, responsive bid to the bidding conditions and that of a responsible, qualified bidder, the City will notify the Apparent Low Bidder.

As its best interests may appear, the City and County of Denver reserves the right to waive informalities in bids, to reject any and all bids and to rebid the Project.

IB-17 NOTICE TO APPARENT LOW BIDDER

The Notice to Apparent Low Bidder, a form of which is included in the Contract Special Conditions Section of the Contract Documents, is issued by the City directly to the selected bidder and informs the bidder that the Manager intends to seek approval of the execution of the Contract by the City in accordance with the Charter and Revised Municipal Code of the City and County of Denver. Specifically, it informs the bidder of its obligations with respect to execution of the Contract and instructs the bidder on how to proceed toward execution of the Contract. The City reserves the right to notify the Apparent Low Bidder, at any time within one hundred twenty (120) days from the date of the opening of the bids, that approval to contract with the Apparent Low Bidder shall be sought in accordance with the Charter and Revised Municipal Code of the City and County of Denver.

In accordance with the terms and conditions contained in the Bid Form and Submittal Package and any additional requirements set forth in the Notice to Apparent Low Bidder or elsewhere in the Contract Documents, the Apparent Low Bidder shall execute the Contract Form contained in the Contract Documents made available by the City for execution in the appropriate number of counterparts. The Apparent Low Bidder shall return the fully executed Contract Document sets, along with any supplemental documents required herein, to the City and shall comply with all other conditions precedent to Contract execution within five (5) days of the date of issuance of the Notice to Apparent Low Bidder by the City. Failure to comply with each of these requirements within five (5) days of the date of issuance of the Notice to Apparent Low Bidder by the City shall render the bid nonresponsive and may constitute cause for rejection.

Issuance of such Notice shall not, however, constitute a commitment on the part of the City or create any rights in the Apparent Low Bidder to any contract with the City.

IB-18 EXECUTION OF CONTRACT

The process of executing a contract requires action by both the apparent low bidder and the City. After it notifies the Apparent Low Bidder, the City will prepare the Contract Documents by incorporating all of the documents submitted by the Apparent Low Bidder into one or more executable copies. Upon notification that contracts documents are ready for execution the Apparent Low Bidder shall execute the contract documents. At this time, the successful bidder shall also provide certain supplemental documents for incorporation into the Contract Documents. These supplemental documents shall include: the properly executed Certificate of Insurance Forms evidencing the apparent low bidder's satisfactory compliance with

the insurance requirements set forth in the Contract Documents; a properly executed Payment and Performance Bond Form and appropriate Power of Attorney evidencing the Apparent Low Bidder's satisfactory compliance with the bonding requirements set forth in the Contract Documents; and documentation of compliance with any other conditions precedent to execution of the Contract by the City set forth in the Contract Documents. The insurance and bond forms contained in the Contract Special Conditions Section of the Contract Documents must be used in satisfying these supplemental document requirements.

These documents are then delivered to the City within the prescribed time period for examination of the documents to determine whether or not the Contractor has correctly executed the Contract and has correctly provided the required supplemental documents and that these documents are satisfactorily and properly completed. From here, all of the documents are forwarded to the City Attorney who will, if the insurance and bonding offered is acceptable and if all other elements of the Contract Documents are in order, recommend that the Manager and the Mayor approve the documents and, when required by the City Charter, prepare an ordinance for submittal to City Council authorizing the execution of the Contract. The City Attorney shall in all applicable instances submit the proposed contract and ordinance to City Council. After City Council approval, the Contract shall be reviewed by the City Attorney and routed for execution by the Mayor, the Clerk for attestation and the Auditor for countersignature and registration. When the total process of contract execution is complete, a Notice to Proceed will be issued and a single executed copy of the Contract will be delivered to the Contractor. Any work performed or a material purchased prior to the issuance of Notice to Proceed is at the Contractor's risk.

IB-19 BONDING REQUIREMENTS

In accordance with the provisions of General Contract Conditions, Title 15, PERFORMANCE AND PAYMENT BONDS, the minimum bonding requirements for this Contract are set forth in the form **CITY AND COUNTY OF DENVER PERFORMANCE AND PAYMENT BOND** contained in the Special Conditions Section of the Contract Documents. Upon receipt of Notice to Apparent Low Bidder, the apparent low bidder must cause this form bond to be purchased, executed and furnished, along with appropriate Powers of Attorney and a surety authorization letter (in form similar to the one attached), to the City in accordance with the instructions contained herein.

IB-20 INSURANCE REQUIREMENTS

The minimum insurance requirements for this Contract are set forth in the Special Conditions Section of the Contract Documents. Bidders are urged to consider, in preparing a bid hereunder, that each condition, requirement or specification set forth in the form certificate must be complied with by the Contractor and all subcontractors performing Work on the Project, unless such requirements are specifically accepted in writing by the City's Risk Management Office. The Contractor must either include all subcontractors performing work hereunder as insureds under each required policy or furnish a separate certificate for each subcontractor. In either case, the Contractor shall insure that each subcontractor complies with all of the coverage requirements.

IB-21 PERMITS AND LICENSES

All permits, licenses and approvals required in the prosecution of the work shall be obtained and paid for by the Contractor.

IB-22 PREVAILING WAGE REQUIREMENTS

Contractor shall comply with, and agrees to be bound by, all requirements, conditions and City determinations regarding the Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. including, but not limited to, the requirement that every covered worker working on a City owned or leased building or on City-owned land shall be paid no less than the prevailing wages and fringe benefits in effect on the date the bid or request for proposal was advertised. In the event a request for bids, or a request for proposal, was not advertised, Contractor shall pay every covered worker no less than the prevailing wages and fringe benefits in effect on the date funds for the contract were encumbered.

Date bid or request for qualifications/proposals was advertised: July 17, 2017.

Prevailing wage and fringe rates will adjust on, and only on, the anniversary of the date the Contract was fully executed. Unless expressly provided for in this Agreement, Contractor will receive no additional compensation for increases in prevailing wages or fringe benefits.

Contractor shall provide the Auditor with a list of all subcontractors providing any services under the contract.

Contractor shall provide the Auditor with electronically-certified payroll records for all covered workers employed under the contract.

Contractor shall prominently post at the work site the current prevailing wage and fringe benefit rates. The posting must inform workers that any complaints regarding the payment of prevailing wages or fringe benefits may be submitted to the Denver Auditor by calling 720-913-5000 or emailing auditor@denvergov.org.

If Contractor fails to pay workers as required by the Prevailing Wage Ordinance, Contractor will not be paid until documentation of payment satisfactory to the Auditor has been provided. The City may, by written notice, suspend or terminate work if Contractor fails to pay required wages and fringe benefits.

IB-23 TAX REQUIREMENTS

General. Bidders are referred to the General Contract Condition 323, TAXES, as to taxes to which they may be subject in performing the Work under this Contract, including but not limited to sales and use taxes and the Denver Occupational Privilege Tax. The following instructions are to be considered along with the General Contract Conditions and not in lieu of them.

Sales and Use Tax. Construction and building materials sold to contractors and subcontractors for use on structures, roads, streets, highways, and other public works owned by the City and County of Denver are exempt from state, RTD, and Cultural Facilities District sales and use taxes. However, such materials will be subject to sales and use taxes imposed by the City and County of Denver.

It is the responsibility of the Contractor and its subcontractors to apply to the Colorado Department of Revenue (“CDOR”) for a certificate, or certificates, of exemption indicating that their purchase of construction or building materials is for a public project, and to deliver to the City copies of such applications as soon as possible after approval by the CDOR. Bidders shall not include in their bid amounts the exempt state, RTD, and Cultural Facilities District Sales and Use Taxes.

Denver Occupational Privilege Tax. Any employee working for a contractor, or a subcontractor, who earns over \$500 working in Denver during a calendar month, is subject to the payment of the Employee Occupational Privilege Tax. The Contractor and any subcontractor must pay the Business Occupational Privilege Tax for each of its employees who are subject to such tax.

IB-24 DIVERSITY AND INCLUSIVENESS IN CITY SOLICITATIONS

Each bidder shall, as a condition of responsiveness to this solicitation, complete and return the “Diversity and Inclusiveness in City Solicitations Information Request Form” with their Bid.

Using the “Diversity and Inclusiveness in City Solicitations Information Request Form” provided, please state whether you have a diversity and inclusiveness program for employment and retention, procurement and supply chain activities, or customer service and provide the additional information requested on the form. The information provided on the “Diversity and Inclusiveness in City Solicitations Information Request Form” will provide an opportunity for City contractors to describe their own diversity and inclusiveness practices. Contractors are not expected to conduct intrusive examinations of its employees, managers, or business partners in order to describe diversity and inclusiveness measures. Rather, the City simply seeks a description of the contractor’s current practices, if any.

Diversity and Inclusiveness information provided by City contractors in response to City solicitations for services or goods will be collated, analyzed, and made available in reports consistent with City Executive Order No. 101. However, no personally identifiable provided by or obtained from contractor’s will be in such reports.

IB-25 MINORITY AND WOMAN BUSINESS ENTERPRISE (M/WBE) REQUIREMENTS

Article III, Divisions 1 and 3 of Chapter 28, Denver Revised Municipal Code (D.R.M.C.), designated as Sections 28-31 – 28-36 and 28-52 – 28-90 D.R.M.C. and referred to in these Bid Documents as the “M/WBE Ordinance” and any Rules or Regulations promulgated pursuant thereto apply to this Project and are incorporated into these Bid Documents by reference. Generally, the M/WBE Ordinance provides for the adoption of a good faith goals program, to be administered by the Division of Small Business Opportunity (DSBO), devised to provide increased bidding opportunities for Minority and Woman Business Enterprises (M/WBEs). As such, each bidder must comply with the terms and conditions of the M/WBE Ordinance in making its bid and, if awarded the Contract, in performing all Work thereunder. A bidder’s failure to comply with the M/WBE Ordinance, any Rules or Regulations promulgated pursuant thereto, or any additional requirement contained herein shall render the bid non-responsive and shall constitute cause for rejection. Failure by the contractor awarded the contract to comply with M/WBE Ordinance requirements during the performance of the contract is a material breach of the contract, which may result in the imposition of sanctions on the Contractor, as deemed appropriate by DSBO. Copies of the M/WBE Ordinance and its accompanying Rules and Regulations are available for the use and review of bidders from DSBO. In order to comply with the bid requirements of the M/WBE Ordinance, a bidder shall either meet the established project goal or, in the alternative, demonstrate that the bidder has made sufficient good faith efforts to meet the goal in accordance with the M/WBE Ordinance.

Meeting Established Goal

In preparing a bid to meet the established Project goal, bidders should consider the following instructions relating to compliance with the M/WBE Ordinance:

1. Under the M/WBE Ordinance, the Director of DSBO (“Director”) is directed to establish project goals for expenditures on construction, reconstruction, and remodeling work performed for the City and County of Denver. The specific goal for this project is stated in the Notice of Invitation for Bids bound herein.
2. In preparing its bid, each bidder shall list on the Bid Form pages entitled "List of Proposed MWBE Bidders, Subcontractors, Suppliers, Manufacturers, Manufacturers' Representatives or Brokers" the name, address, work description/supply, committed level of participation and other required information for each M/WBE of any tier which the bidder intends to use in performing the work on this Project. **Only the M/WBEs identified and the precise levels of participation listed for each on the Bid Form page, at the time of bid opening, will be considered in determining whether the bidder has met the designated participation goal. Additional, revised or corrected participation submitted after bid opening will not be considered.** M/WBE bidders may count self-performance or joint venture activity in meeting the M/WBE project goal, but only for the scope of work performed as a commercially useful function and at a percentage level the M/WBE will be performing itself.
3. Any agreement between a bidder or proposer and an MBE or WBE in which the bidder or proposer requires that the MBE or WBE not provide subcontracting quotations to other bidders or proposers is prohibited and shall render a bidder's bid or proposer's proposal nonresponsive. D.R.M.C. 28-63(f)
4. If a bidder/proposer is participating in a joint venture with a certified M/WBE firm, complete the Joint Venture Eligibility Form and Joint Venture Affidavit contained in this bid document/RFP. Submit the aforementioned forms with the firm’s Joint Venture Agreement, to the DSBO Director, **at least 10 working days prior to the proposal submittal.** The Joint Venture must be approved prior to the bid opening or proposal submittal by the DSBO Director. Approval by the DSBO Director includes determining the amount the Joint Venture will count towards meeting the project goal.
5. All M/WBEs listed on the Bid Form must be properly certified by the City on or before the date bids are opened in order to count towards meeting the designated goal. DSBO maintains an M/WBE Directory (“Directory”), which is a current listing of M/WBEs that have been certified by the City. A copy of the DSBO Directory is located at DSBO web site at <https://www.denvergov.org/dsbo>.

Bidders are encouraged to use the Directory to assist in locating M/WBEs for the work and supplies required on the Project. Bidders are reminded that changes may be made to the Directory at anytime in accordance with the City's M/WBE Ordinance and procedures established to administer this program and a current copy of the Directory must always be used in preparing a bid. M/WBE certification or listing in the Directory is not a representation or warranty by the City as to the qualifications of any listed M/WBE.

6. In accordance with the provisions of the M/WBE Ordinance, DSBO will evaluate each bid to determine the responsiveness of the bid to the requirements of the M/WBE Ordinance. In determining whether a bidder's committed level of participation meets or exceeds the stated M/WBE goal, DSBO shall base its calculation of applicable amounts and percentages on the total base bid amount, not including any listed alternates, of each bid as follows:
 - a. The bid information provided by the agency will be used to determine the total base bid amount of each bid. Each bidder's total base bid amount will be multiplied by the M/WBE percentage established for the project to determine the exact dollar amount of required M/WBE participation for the Project. This amount will then be compared against the exact dollar amounts for the M/WBE committed for participation by the bidder. If the total dollar amount of participation listed meets or exceeds the established M/WBE dollar amount goal listed, then DSBO will determine that the goal has been met.
 - b. In addition, DSBO will determine the exact commitment percentage for each listed M/WBE by dividing the dollar amount listed for each M/WBE by the total base bid dollar amount submitted by the bidder. These individual percentages, when totaled for all listed M/WBE, will establish the total committed percentage level of M/WBE participation that the bidder must comply with during the life of the contract. In all cases, the committed percentage level of M/WBE participation must equal or exceed the assigned M/WBE goal for the Project.
 - c. In providing the exact dollar amount of participation for each listed M/WBE, a bidder should take care never to round up in determining whether or not the total of these amounts meets or exceeds the established percentage goal. The goal must be met or exceeded by dollar amounts and percentages in order for DSBO to determine that the bidder has met or exceeded the applicable M/WBE goal.
 - d. As previously mentioned, compliance with the M/WBE goal will be determined on the base bid alone. If a bid contains alternates, participation contained in any alternate will not count towards satisfaction of the Project goal. However, should any designated alternate be selected by the City for inclusion in the contract ultimately awarded, the M/WBE goal percentage level submitted at bid time, on the base bid, will also apply to the selected alternates and must be maintained for the life of the contract on the total contract amount, including any alternate work. Thus, even though such participation will not be considered in evaluating bids, bidders are urged to consider participation in preparing bids for designated alternates.
 - e. On projects where force account or allowance bid items have been included, bidders must meet the M/WBE goal percentage based upon the total base bid, including all such items that are submitted to the City. However, when a force account or allowance is designated by the City to be either performed or purchased from a specific company, the bidder may back out the dollar amount of the force account or allowance from the total base bid and meet the M/WBE goal on the remaining reduced amount.
 - f. On bids which, at the time of bid opening, are equal to or exceed Five Million Dollars (\$5,000,000.00), including any alternates which may be selected, only sixty percent (60%) of the value of the commercially useful function performed by M/WBE suppliers shall count toward satisfaction of the Project goal. On Projects under Five Million (\$5,000,000.00) the value of the commercially useful function of M/WBE supplier(s) will

count at a one hundred percent (100%) level. Manufacturer's representatives and packagers shall be counted in the same manner as brokers.

- g. In utilizing the M/WBE participation of a Broker only the bona fide commissions earned by such Broker for its performance of a commercially useful function will count toward meeting the Project goals. The bidder must separate the bona fide brokerage commissions from the actual cost of the supplies or materials provided to determine the actual dollar amount of participation that can be counted towards meeting the goal.
7. On or before the third (3rd) working day after bid opening, all of the Bidders are required to submit an executed "Letter of Intent" for each M/WBE listed on the Bid Form as a joint venture member, subcontractor, supplier, manufacturer, manufacturers' representative or broker of any tier. **An MBE or WBE Prime Bidder needs to submit a Letter of Intent for itself for self-performed work**, and must identify their level of participation on the designated M/WBE participation page bound herein. A Letter of Intent shall be submitted only for the M/WBEs listed at the time of bid opening, since this is the only participation that will be counted toward satisfaction of the project goal. A form for the M/WBE Letter of Intent is included with the Bid Form. The M/WBE Letter of Intent is a written communication from the Bidder to the City evidencing an understanding that the Bidder has or will enter into a contractual relationship with the M/WBE or that its subcontractor(s) and supplier(s), manufacturer(s), manufacturers' representative(s) and broker(s) will do so. Each M/WBE Letter of Intent shall be accompanied by a copy of the City and County of Denver's M/WBE certification letter for each proposed M/WBE identified at bid time. Bidders are urged to carefully review these Letters before submission to the City to ensure that they are properly completed and executed by the appropriate parties.

Good Faith Effort.

In preparing a bid to demonstrate a good faith effort, bidders should consider the following instructions relating to compliance with the M/WBE Ordinance:

1. If the bidder or proposer has not fully met the project goal as provided in section 28-60, then it shall demonstrate that it has made good faith efforts to meet such goal. The bidder or proposer shall furnish to the director, within three (3) working days after bid opening by the City or on or before the time of the final project-specific proposal submitted to and authorized by the City pursuant to a competitive selection process, or bid selection by a private owner, a detailed statement of its good faith efforts to meet the project goal set by the director. This statement shall address each of the items in subsection (b) and any additional criteria that the director may establish by rule or regulation consistent with the purposes of this division 3. Good faith efforts must be demonstrated to be meaningful and not merely for formalistic compliance with this Division 3. The scope and intensity of the efforts will be considered in determining whether the bidder or proposer has achieved a good faith effort.
2. The statement of good faith efforts shall include a specific response and verification with respect to each of the following good faith effort categories, which may be further defined by rule or regulation. A bidder or proposer may include any additional information it believes may be relevant. Failure of a bidder or proposer to show good faith efforts as to any one (1) of the following categories shall render its overall good faith effort showing insufficient and its bid or proposal non-responsive:
 - a. If prebid or preselection meetings are scheduled by the City at which MBEs and WBEs may be informed of subcontracting or joint venture opportunities under a proposed contract to be bid, or procured pursuant to the competitive selection process, attendance at such prebid or preselection meetings is not mandatory; however, bidders and proposers are responsible for the information provided at these meetings.
 - b. The bidder or proposer must solicit through all reasonable and available means, the interest of all MBEs and WBEs certified in the scopes of work of the contract. The bidder or proposer must solicit the interest of such MBEs and WBEs within sufficient time, prior to the bid opening or date of final project-specific proposal in the case of a competitive selection process, to allow such MBEs and WBEs to respond to the solicitation. The bidder or proposer must determine with certainty

- if the MBEs and WBEs are interested by demonstrating appropriate steps to follow up initial solicitations.
- c. The bidder or proposer must select portions of the work of the contract to be performed by MBEs and WBEs in order to increase the likelihood that the project goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MBE and WBE participation as subcontractors or joint venturers, and for bidder or proposer self-performed work, as suppliers, manufacturers, manufacturer's representatives and brokers, all reasonably consistent with industry practice, even when the bidder or proposer would otherwise prefer to perform these work items with its own forces. The bidder or proposer must identify what portions of the contract will be self-performed and what portions of the contract will be opened to solicitation of bids, proposals and quotes from MBE and WBEs. All portions of the contract not self-performed must be solicited for MBE and WBE participation. The ability or desire of a bidder or proposer to perform the work of a contract with its own forces does not relieve the bidder or proposer of the responsibility to meet the project goal or demonstrate good faith efforts to do so.
 - d. The bidder or proposer, consistent with industry practice, must provide MBEs and WBEs at a clearly stated location with timely, adequate access to and information about the plans, specifications, and requirements of the contract, including bonding and insurance requirements, if any, to assist them in responding to a solicitation.
 - e. The bidder or proposer must negotiate in good faith with interested MBEs and WBEs and provide written documentation of such negotiation with each such MBE or WBE.
 - f. For each MBE or WBE which contacted the bidder or proposer or which the bidder or proposer contacted or attempted to subcontract or joint venture with, consistent with industry practice, the bidder or proposer must supply a statement giving the reasons why the bidder or proposer and the MBE or WBE did not succeed in negotiating a subcontracting, supplier, manufacturer, manufacturer's representative, broker or joint venture agreement, as applicable.
3. The bidder or proposer must provide verification that it rejected each non-utilized MBE and WBE because the MBE or WBE did not submit the lowest bid or it was not qualified. Such verification shall include a verified statement of the amounts of all bids received from potential or utilized subcontractors, suppliers, manufacturers, manufacturer's representatives, brokers or joint venturers on the contract, whether or not they are MBEs or WBEs. In making such a determination of not being qualified, the bidder or proposer shall be guided by the definition of qualified in section 28-54(42), but evidence of lack of qualification must be based on factors other than solely the amount of the MBE's or WBE's bid. For each MBE or WBE found not to be qualified by the bidder or proposer, the verification shall include a statement giving the bidder's or proposer's reasons for its conclusion. A bidder's or proposer's industry standing or group memberships may not be the cause of rejection of an MBE or WBE. A bidder or proposer may not reject an MBE or WBE as being unqualified without sound reasons based on a reasonably thorough investigation and assessment of the MBE's or WBE's capabilities and expertise.
 4. If requested by a solicited MBE or WBE, the bidder or proposer must make reasonable efforts to assist interested MBEs and WBEs in obtaining bonding, lines of credit, or insurance as required by the City or by the bidder or proposer, provided that the bidder or proposer need not provide financial assistance toward this effort.
 5. If requested by a solicited MBE or WBE, the bidder or proposer must make reasonable efforts to assist interested MBEs and WBEs in obtaining necessary and competitively priced equipment, supplies, materials, or related assistance or services for performance under the contract, provided that the bidder or proposer need not provide financial assistance toward this effort.

6. The bidder or proposer must use the DSBO MBE/WBE directories to identify, recruit, and place MBEs and WBEs.
7. In determining whether a bidder or proposer has satisfied good faith efforts as to a project goal, the success or failure of other bidders or proposers on the contract in meeting such project goal may be considered.

Continuing Commitments.

In accordance with the provisions of the M/WBE Ordinance, the bidder agrees that it is committed to meeting either the M/WBE participation goal or the M/WBE participation set forth in its statement of good faith. This commitment must be expressly indicated on the "Commitment to MWBE SBE Participation" form included with the Bid Form. This commitment includes the following understandings:

1. The bidder understands it must maintain M/WBE goals throughout the performance of the Contract pursuant to the requirements set out in D.R.M.C. 28-72.
2. The bidder understands that it must establish and maintain records and submit regular reports, as required, which will allow the City to assess progress in achieving the M/WBE participation goal.
3. The bidder understands that if change orders or any other contract modifications are issued under the contract, the bidder shall have a continuing obligation to immediately inform DSBO in writing of any agreed upon increase or decrease in the scope of work of such contract, upon any of the bases discussed in Section 28-73 of the M/WBE Ordinance, regardless of whether such increase or decrease in scope of work has been reduced to writing at the time of notification.
4. The bidder understands that if change orders or other contract modifications are issued under the contract, that include an increase in scope of work of a contract for construction, reconstruction, or remodeling, whether by amendment, change order, force account or otherwise which increases the dollar value of the contract, whether or not such change is within the scope of work designated for performance by an M/WBE at the time of contract award, such change orders or contract modification shall be immediately submitted to DSBO for notification purposes. Those amendments, change orders, force accounts or other contract modifications that involve a changed scope of work that cannot be performed by existing project subcontractors or by the contractor shall be subject to a goal for M/WBEs equal to the original goal on the contract which was included in the bid. The contractor shall satisfy such goal with respect to such changed scope of work by soliciting new M/WBEs in accordance with Section 28-73 of the M/WBE Ordinance as applicable, or the contractor must show each element of modified good faith set out in Section 28-75(c) of the M/WBE Ordinance. The contractor shall supply to the director the documentation described in Section 28-75(c) of the M/WBE Ordinance with respect to the increased dollar value of the contract.

All bidders are charged with knowledge of and are solely responsible for complying with each and every provision of the M/WBE Ordinance in making a bid and, if awarded, in performing the work described in the Contract Documents. Failure to comply with these provisions could constitute cause for rejection of a bid or subject the selected contractor to sanctions set forth in the M/WBE Ordinance. These instructions are intended only to generally assist the bidder in preparing and submitting a compliant bid. Should any questions arise regarding specific circumstances, bidders must consult the M/WBE Ordinance or contact the Project's designated DSBO representative at (720) 913-1999.

IB- 26 DISCLOSURE OF INFORMATION

All submissions and other materials provided or produced pursuant to this Invitation for Bids may be subject to the Colorado Open Records Law, C.R.S. 24-72-201, et seq. As such, bidders are urged to review these disclosure requirements and any exceptions to disclosure of information furnished by another party and, prior to submission of a bid to the City, appropriately identify materials that are not subject to disclosure. In the event of a request to the City for disclosure of such information, the City shall advise the bidder of such request to give the bidder an opportunity to object to the disclosure of designated confidential materials furnished to the City. In the event of the filing of a lawsuit to compel such disclosure, the City will tender all such material to the court for judicial determination of the issue of disclosure and each bidder agrees to intervene in such lawsuit to protect and assert its claims of privilege against disclosure of such material. Each

bidder further agrees to defend, indemnify and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of the bidder's intervention to protect and assert its claims of privilege against disclosure under the Open Records Law including, but not limited to, prompt reimbursement to the City of all reasonable attorney fees, costs and damages that the City may incur directly or may be ordered to pay by such court.

IB-27 GENERAL BIDDING INFORMATION

Bidders are instructed to contact the Contract Administrator designated below for this Project for pre-bid, post-bid and general City bidding information. Bidders can also visit www.work4denver.com for information, both general and project specific. The Contract Administrator assigned to this project is Diane Urbina who can be reached via email at diane.urbina@denvergov.org.

IB-28 PAYMENT PROCEDURE REQUIREMENTS

Contractor recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System (CPM System) for this Project. All fees associated with the CPM System are to be paid by the Contractor for billings for work performed. Bidders are required, when preparing a bid, to enter the price of the CPM service on the line provided for the service. The fee is all inclusive of all subcontractor, project and subscription fees associated with the CPM system. The bidder will calculate the fee based on a percentage of their total bid, and then should include it on the line item provided in the bid form labeled “Textura® Construction Payment Management System Fee”. This expense becomes part of the contract and billable to the City. Textura will invoice the awarded contractor directly. All costs including but not limited to costs associated with training, entering data or utilizing Textura other than the Textura Construction Payment Management System Fee are overhead and shall not be reimbursed by the City. Contractor is responsible for tax on Textura fee. As with other taxes, the City will not reimburse Contractor for this cost and therefore this cost should be included in Contractor's bid. Textura will invoice the awarded contractor directly.

PROJECT SIZE	FEE (% OF BID)
< \$1,000,000	0.22% (.0022)
\$1,000,001 - \$5,000,000	0.17% (.0017)
\$5,000,001 - \$20,000,000	0.12% (.0012)
\$20,000,001 - \$50,000,000	0.10% (.0010)
\$50,000,001 - \$100,000,000	0.08% (.0008)
\$100,000,001 - \$500,000,000	0.05% (.0005)
> \$500,000,000	CONTACT TEXTURA FOR PROGRAM PRICING

For more information:

<http://www.denvergov.org/content/denvergov/en/contract-administration/bidding-process.html>

**RULES AND REGULATIONS
REGARDING
EQUAL EMPLOYMENT OPPORTUNITY**

Promulgated and adopted by the Manager of Public Works pursuant to and by authority of Article III, Division 2, Chapter 28 of the Revised Municipal Code of the City and County of Denver, and for the purpose of insuring that contractors, subcontractors and suppliers soliciting and receiving compensation for contract work from or through the City and County of Denver provide equal opportunity in employment without regard to race, color, creed, sex, national origin, age, religion, marital status, political opinion or affiliation or mental or physical handicap and meet certain requirements for the hiring, training, promotion, and treatment during employment of members of ethnic groups subject to differential treatment, including persons of African descent (Black), Spanish-surnamed (Hispanic), Asian-American and American Indian Groups.

RULE I - DEFINITIONS

- A. "City" means the City and County of Denver.
- B. "Manager" shall mean the Manager of Public Works for the City and County of Denver.
- C. "Contract" means a contract entered into with the City and County of Denver, financed in whole or in part by local resources or funds of the City and County of Denver, for the construction of any public building or prosecution or completion of any public work.
- D. "Contractor" means the original party to a contract with the City and County of Denver, also referred to as the "general" or "prime" contractor.
- E. "Director" means the Director of the Division of Small Business Opportunity.
- F. "Subcontractor" means any person, company, association, partnership, corporation, or other entity, which assumes by subordinate agreement some or all of the obligations of the general or prime contractor.
- G. The phrase "Bidding Specifications" as used in Article III, Division 2 of Chapter 28 of the Revised Municipal Code shall include BID CONDITION, INVITATION TO BID, and NOTICE OF PROPOSAL.
- H. "Affirmative Action Program" means a set of specific and result-oriented procedures or steps to which a contractor commits himself to apply every good faith effort to employ members of ethnic minority groups, to include persons of African descent (Black), Spanish surnamed (Hispanic), Asian-American, American Indians, and persons with mental or physical handicap.
- I. "Division of Small Business Opportunity" means the City agency established pursuant to Article III, Division 1 of Chapter 28 of the Denver Revised Municipal Code.

RULE II - NOTICE OF HEARING

When results of conciliation efforts are unsatisfactory to the Manager and he is informed in accordance with Article III, Division 2 of Chapter 28 of the Revised Municipal code that a contractor or subcontractor has apparently failed to meet affirmative action and equal employment opportunity requirements after a reasonable period of notice to correct deficiencies, the Manager will, prior to imposition of any sanctions, afford the general contractor a hearing in order to determine whether the contractor or his subcontractors have failed to comply with the affirmative action and equal employment opportunity requirements of Article III, Division 2 of Chapter 28 of the Revised Municipal Code or of the contract. Written notice of such hearing shall be delivered personally or sent by certified mail, return receipt requested, to the contractor and to any subcontractor involved, at least ten (10) days prior to the date scheduled for the hearing.

RULE III - HEARING

- A. Contractors will appear at hearings and may be represented by counsel, and may present testimony orally and other evidence.
- B. Hearings shall be conducted by one or more hearing examiners designated as such by the Manager.
- C. The Director of the Division of Small Business Opportunity may participate in hearings as a witness.
- D. Hearings shall be held at the place specified in the notice of hearing.
- E. All oral testimony shall be given under oath or affirmation and a record of such proceedings shall be made.
- F. All hearings shall be open to the public.
- G. The hearing officer shall make recommendations to the Manager who shall make a final decision.

REGULATIONS

REGULATION NO. 1 - ORDINANCE:

The Rules and Regulations of the Manager shall be inserted in the bidding specifications for every contract for which bidding is required.

REGULATION NO. 2 - EXEMPTIONS:

Each contract and subcontract, regardless of the dollar amount, shall be subject to affirmative action requirements unless specifically exempted in writing individually by the Manager. Exemptions apply only to "affirmative action" in equal employment opportunity, and are not to be construed as condonation in any manner of "discrimination" or "discriminatory practices" in employment because of race, color, creed, sex, age, national origin, religion, marital status, political opinion or mental or physical handicap.

REGULATION NO. 3 - DIRECTOR OF CONTRACT COMPLIANCE:

The Director of the Division of Small Business Opportunity shall perform the duties assigned to such official by Article III, Division 2 Chapter 28 of the Revised Municipal Code and by the Manager. (1) The Director of the Division of Small Business Opportunity or designated representatives shall inform bidders and contractors of affirmative action procedures, programs, and goals in accordance with the Ordinance at pre-bid and pre-construction conference; (2) make regular on-site inspections; (3) supply contractors and subcontractors with report forms to be completed by them when requested, and furnished to the Director of the Division of Small Business Opportunity; and (4) review payroll records, employment records and practices of general contractors and their subcontractors and suppliers during the performance of any contract. The Director of the Division of Small Business Opportunity shall promptly report apparent affirmative action deficiencies to the Manager.

REGULATION NO. 4 - GOALS AND TIMETABLES:

In general, goals and timetables should take into account anticipated vacancies and the availability of skills in the market place from which employees should be drawn. In addition, where discrimination in employment by a general contractor or any of his subcontractors is indicated, a corrective action program will take into account the need by the general contractor and his subcontractors to correct past discriminatory practices and reach goals of minority manpower utilization on a timely basis through such recruiting and advertising efforts as are necessary and appropriate.

REGULATION NO. 5 - AWARD OF CONTRACTS:

It shall be the responsibility of the Director of the Division of Small Business Opportunity to determine the affirmative action capability of bidders, contractors and subcontractors and to recommend to the Manager the award of contracts to those bidders, contractors and subcontractors and suppliers who demonstrate the ability and willingness to comply with the terms of their contract.

REGULATION NO. 6 - PUBLICATION AND DUPLICATION:

Copies of these Rules and Regulations as amended by the Manager from time to time, shall as soon as practicable and after Notice being published will be made a part of all City Contracts.

REGULATION NO. 7 - NOTICE TO PROCEED:

Prior to issuance of the Notice to Proceed, a sign-off will be required of the Director of the Division of Small Business Opportunity or his designee.

REGULATION NO. 8 - CONTRACTS WITH SUBCONTRACTORS:

To the greatest extent possible, the contractor shall make a good faith effort to contract with minority contractors, subcontractors and suppliers for services and supplies by taking affirmative actions, which include but are not limited to the following:

1. Advertise invitations for subcontractor bids in minority community news media.
2. Contact minority contractor organizations for referral of prospective subcontractors.
3. Purchase materials and supplies from minority material suppliers.

REGULATION NO. 9 - AGENCY REFERRALS:

It shall be no excuse that the union with which the contractor or subcontractor has an agreement providing for referral, exclusive or otherwise, failed to refer minority employees.

REGULATION NO. 10 - CLAUSES:

The Manager shall include the appropriate clauses in every contract and the contractor shall cause to be inserted in every subcontract the appropriate clauses:

1. APPENDIX A: City and County of Denver Equal Opportunity Clause - ALL CONTRACTS funded only with City and County of Denver monies.
2. APPENDIX B: Equal Opportunity Clause (11246) - ALL FEDERAL ASSISTED.
3. APPENDIX C: Section 3 - Assurance of Compliance - HUD ASSISTED PROJECTS.
4. APPENDIX D: Section 3 - Clause - HUD ASSISTED PROJECTS.

All amendments to the appendices shall be included by reference.

REGULATION NO. 11 - SHOW CAUSE NOTICES:

When the Manager has reasonable cause to believe that a contractor has violated Article III, Division 2 of Chapter 28 of the Denver Revised Municipal Code, he may issue a notice requiring the contractor to show cause, within fifteen (15) days why enforcement procedures, or other appropriate action to insure compliance, should not be instituted.

REGULATION NO. 12 - BID CONDITIONS - AFFIRMATIVE ACTION REQUIREMENTS - EQUAL EMPLOYMENT OPPORTUNITY:

1. APPENDIX E: The Bid Conditions - Affirmative Action Requirements - Equal Employment Opportunity as amended and published by the U.S. Department of Labor Employment Standards Administration, Office of Federal Contract Compliance, shall be inserted verbatim for bidding specification for every non-exempt contract involving the use of Federal funds.
2. APPENDIX F: The Bid Conditions - Affirmative Action Requirements - Equal Employment Opportunity as published by the Department of Public Works, City and County of Denver, shall be inserted verbatim as bidding specifications for every non-exempt contract using City funds.

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management

APPENDIX A

**CITY AND COUNTY OF DENVER EQUAL OPPORTUNITY CLAUSE -
ALL CONTRACTS**

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap.
3. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided, advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. Each Contractor will comply with all provisions of Article III, Division 2 of Chapter 28 of the Revised Municipal Code, and the rules, regulations, and relevant orders of the Manager and the Director.
5. The Contractor will furnish all information and reports required by Article III, Division 2 of Chapter 28 of the Revised Municipal Code, and by rules, regulations and orders of the Manager and Director or pursuant thereto, and will permit access to his books, records, and accounts by the Manager, Director, or their designee for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further City contracts in accordance with procedures authorized in Article III, Division 2, Chapter 28 of the Revised Municipal Code, or by rules, regulations, or order of the Manager.
7. The Contractor will include Regulation 12, Paragraph 2 and the provisions of paragraphs (1) through (6) in every subcontract of purchase order unless exempted by rules, regulations, or orders of the Manager issued pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code, so that such provisions will be binding on each subcontractor or supplier. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

The applicant further agrees to be bound by the above equal opportunity clauses with respect to its own employment practices when it participates in City contracts. The Contractor agrees to assist and cooperate actively with the Manager and the Director in obtaining compliance of subcontractors and suppliers with the equal opportunity clause and the rules, regulations and relevant orders of the Manager, and will furnish the Manager and the Director such information as they may require for the supervision of compliance, and will otherwise assist the Manager and Director in the discharge of the City's primary responsibility for securing

compliance. The Contractor further agrees to refrain from entering into any contract or contract modification subject to Article III, Division 2 of Chapter 28 of the Revised Municipal Code with a contractor debarred from, or who has not demonstrated eligibility for, City contracts.

The Contractor will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the Manager and Director. In addition, the Contractor agrees that failure or refusal to comply with these undertakings the Manager may take any or all of the following actions:

- A. Cancellation, termination, or suspension in whole or in part of this contract.
- B. Refrain from extending any further assistance to the applicant under the program with respect to which the failure occurred until satisfactory assurance of future compliance has been received from such applicant.
- C. Refer the case to the City Attorney for appropriate legal proceedings.

SUBCONTRACTS: Each prime Contractor or Subcontractor shall include the equal opportunity clause in each of its subcontracts.

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management

APPENDIX F

AFFIRMATIVE ACTION REQUIREMENTS

EQUAL EMPLOYMENT OPPORTUNITY

For All Non-Exempt Construction Contracts to Be Awarded by the
City and County of Denver, Department of Public Works.

NOTICE

EACH BIDDER, CONTRACTOR OR SUBCONTRACTOR (HEREINAFTER THE CONTRACTOR) MUST FULLY COMPLY WITH THE REQUIREMENTS OF THESE BID CONDITIONS AS TO EACH CONSTRUCTION TRADE IT INTENDS TO USE ON THIS CONSTRUCTION CONTRACT, AND ALL OTHER CONSTRUCTION WORK (BOTH CITY AND NON-CITY) IN THE DENVER AREA DURING THE PERFORMANCE OF THIS CONTRACT OR SUBCONTRACT. THE CONTRACTOR COMMITS ITSELF TO THE GOALS FOR MINORITY MANPOWER UTILIZATION, AS APPLICABLE, AND ALL OTHER REQUIREMENTS, TERMS AND CONDITION OF THESE BID CONDITIONS BY SUBMITTING A PROPERLY SIGNED BID.

THE CONTRACTOR SHALL APPOINT A COMPANY EXECUTIVE TO ASSUME THE RESPONSIBILITY FOR THE IMPLEMENTATION OF THE REQUIREMENTS, TERMS AND CONDITIONS OF THESE BID CONDITIONS.

/s/ _____

Executive Director of Public Works
City and County of Denver

A. REQUIREMENTS - AN AFFIRMATIVE ACTION PLAN:

Contractors shall be subject to the provisions and requirements of these bid conditions including the goals and timetables for minority* and female utilization, and specific affirmative action steps set forth by the Division of Small Business Opportunity (DSBO). The contractor's commitment to the goals for minority, and female utilization as required constitutes a commitment that it will make every good faith effort to meet such goals.

1. GOALS AND TIMETABLES:

The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade are as follows:

GOALS FOR MINORITY PARTICIPATION FOR EACH TRADE	GOALS FOR FEMALE PARTICIPATION FOR EACH TRADE
From January 1, 1982 to Until Further Notice	From January 1, 1982 to Until Further Notice
21.7% - 23.5%	6.9%

The goals for minority and female utilization above are expressed in terms of hours of training and employment as a proportion of the total number of hours to be worked by the contractor's aggregate workforce, which includes all supervisory personnel, in each trade, on all projects for the City and County of Denver during the performance of its contract (i.e., The period beginning with the first day of work on the City and County of Denver funded construction contract and ending with the last day of work).

The hours of minority and female employment and training must be substantially uniform throughout the length of the contract in each trade and minorities and females must be employed evenly on each of a contractor's projects. Therefore, the transfer of minority or female employees from contractor to contractor or from project to project for the purpose of meeting the contractor's goals shall be a violation of these Bid Conditions.

If the Contractor counts the nonworking hours of apprentices they must be employed by the Contractor during the training period; the Contractor must have made a commitment to employ apprentices at the completion of their training subject to the availability of employment opportunities; and the apprentices must be trained pursuant to training programs approved by the Bureau of Apprenticeship and Training.

* "Minority" is defined as including, Blacks, Spanish Surname Americans, Asian Americans, and American Indians, and includes both men and minority women.

2. SPECIFIC AFFIRMATIVE ACTION STEPS:

No contractor shall be found to be in noncompliance solely on account of its failure to meet its goals, but will be given an opportunity to demonstrate that the contractor has instituted all the specific affirmative action steps specified and has made every good faith effort to make these steps work toward the attainment of its goals within the timetables, all to the purpose of expanding minority and female utilization in its aggregate workforce. A contractor, who fails to comply with its obligation under the Equal Opportunity Clause of its contract and fails to achieve its commitments to the goals for minority and female utilization has the burden of proving that it has engaged in an Affirmative Action Program directed at increasing minority and female utilization and that such efforts were at least as extensive and as specific as the following:

- a. The Contractor should have notified minority and female organizations when employment opportunities were available and should have maintained records of the organization's response.

- b. The Contractor should have maintained a file of the names and addresses of each minority and female referred to it by any individual or organization and what action was taken with respect to each such referred individual, and if the individual was not employed by the Contractor, the reasons. If such individual was sent to the union hiring hall for referral and not referred back by the union or if referred, not employed by the Contractor, the file should have documented this and their reasons.
- c. The Contractor should have promptly notified the Department of Public Works, and the Division of Small Business Opportunity when the union or unions with which the Contractor has collective bargaining agreements did not refer to the contractor a minority or female sent by the contractor, or when the Contractor has other information that the union referral process has impeded efforts to meet its goals.
- d. The Contractor should have disseminated its EEO policy within its organization by including it in any employee handbook or policy manual; by publicizing it in company newspapers and annual reports and by advertising such policy at reasonable intervals in union publications. The EEO policy should be further disseminated by conducting staff meetings to explain and discuss the policy; by posting of the policy; and by review of the policy with minority and female employees.
- e. The Contractor should have disseminated its EEO policy externally by informing and discussing it with all recruitment sources; by advertising in news media, specifically including minority and female news media; and by notifying and discussing it with all subcontractors.
- f. The Contractor should have made both specific and reasonably recurrent written and oral recruitment efforts. Such efforts should have been directed at minority and female organizations, schools with substantial minority and female enrollment, and minority and female recruitment and training organizations within the Contractor's recruitment area.
- g. The Contractor should have evidence available for inspection that all tests and other selection techniques used to select from among candidates for hire, transfer, promotion, training, or retention are being used in a manner that does not violate the OFCCP Testing Guidelines in 41 CFR Part 60-3.
- h. The Contractor should have made sure that seniority practices and job classifications do not have a discriminatory effect.
- i. The Contractor should have made certain that all facilities are not segregated by race.
- j. The Contractor should have continually monitored all personnel activities to ensure that its EEO policy was being carried out including the evaluation of minority and female employees for promotional opportunities on a quarterly basis and the encouragement of such employees to seek those opportunities.
- k. The Contractor should have solicited bids for subcontracts from available minority and female subcontractors engaged in the trades covered by these Bid Conditions, including circulation of minority and female contractor associations.

NOTE: The Director and the Division of Small Business Opportunity will provide technical assistance on questions pertaining to minority and female recruitment sources, minority and female community organizations, and minority and female news media upon receipt of a request for assistance from a contractor.

3. NON - DISCRIMINATION:

In no event may a contractor utilize the goals and affirmative action steps required in such a manner as to cause or result in discrimination against any person on account of race, color, religion, sex, marital status, national origin, age, mental or physical handicap, political opinion or affiliation.

4. COMPLIANCE AND ENFORCEMENT:

In all cases, the compliance of a contractor will be determined in accordance with its obligations under the terms of these Bid Conditions. All contractors performing or to perform work on projects subject to these Bid Conditions hereby agree to inform their subcontractors in writing of their respective obligations under the terms and requirements of these Bid Conditions, including the provisions relating to goals of minority and female employment and training.

B. CONTRACTORS SUBJECT TO THESE BID CONDITIONS:

In regard to these Bid Conditions, if the Contractor meets the goals set forth therein or can demonstrate that it has made every good faith effort to meet these goals, the Contractor shall be presumed to be in compliance with Article III, Division 2 of Chapter 28 of the Revised Municipal Code, the implementing regulations and its obligations under these Bid Conditions. In the event, no formal sanctions or proceedings leading toward sanctions shall be instituted unless the contracting or administering agency otherwise determines that the contractor is violating the Equal Opportunity Clause.

1. Where the Office of Contract Compliance finds that a contractor failed to comply with the requirements of Article III, Division 2 of Chapter 28 of the Revised Municipal Code or the implementing regulations and the obligations under these Bid Conditions, and so informs the Manager, the Manager shall take such action and impose such sanctions, which include suspension, termination, cancellation, and debarment, as may be appropriate under the Ordinance and its regulations. When the Manager proceeds with such formal action it has the burden of proving that the Contractor has not met the goals contained in these Bid Conditions. The Contractor's failure to meet its goals shall shift to it the requirement to come forward with evidence to show that it has met the good faith requirements of these Bid Conditions.
2. The pendency of such proceedings shall be taken into consideration by the Department of Public Works in determining whether such contractor can comply with the requirements of Article III, Division 2 of Chapter 28 of the Revised Municipal Code, and is therefore a "responsible prospective contractor".
3. The Division of Small Business Opportunity shall review the Contractor's employment practices during the performance of the contract. If the Division of Small Business Opportunity determines that the Contractor's Affirmative Action Plan is no longer an acceptable program, the Director shall notify the Manager.

C. OBLIGATIONS APPLICABLE TO CONTRACTORS:

It shall be no excuse that the union with which the Contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority or female employees. Discrimination in referral for employment, even if pursuant to provisions of a collective bargaining agreement, is prohibited by the National Labor Relations Act, as amended, Title VI of the Civil Rights Act of 1964, as amended, and Article III, Division 2 of Chapter 28 of the Revised Municipal Code. It is the policy of the Department of Public Works that contractors have a responsibility to provide equal employment opportunity, if they wish to participate in City and County of Denver contracts. To the extent they have delegated the responsibility for some of their employment practices to a labor organization and, as a result, are prevented from meeting their obligations pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code, such Contractors cannot be considered to be in compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, or its implementing rules and regulations.

D. GENERAL REQUIREMENTS:

Contractors are responsible for informing their subcontractors in writing regardless of tier, as to their respective obligations. Whenever a Contractor subcontracts a portion of work in any trade covered by these Bid Conditions, **it shall include these Bid Conditions in such subcontracts and each subcontractor shall**

be bound by these Bid Conditions to the full extent as if it were the prime contractor. The Contractor shall not, however, be held accountable for the failure of its subcontractors to fulfill their obligations under these Bid Conditions. However, the prime contractor shall give notice to the Director of any refusal or failure of any subcontractor to fulfill the obligations under these Bid Conditions. A subcontractor's failure to comply will be treated in the same manner as such failure by a prime contractor.

1. Contractors hereby agree to refrain from entering into any contract or contract modification subject to Article III, Division 2, Chapter 28 of the Revised Municipal Code with a contractor debarred from, or who is determined not to be a "responsive" bidder for the City and County of Denver contracts pursuant to the Ordinance.
2. The Contractor shall carry out such sanctions and penalties for violation of these Bid Conditions and the Equal Opportunity Clause including suspension, termination and cancellation of existing subcontracts and debarment from future contracts as may be ordered by the Manager pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code and its implementing regulations.
3. Nothing herein is intended to relieve any contractor during the term of its contract from compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, and the Equal Opportunity Clause of its contract with respect to matters not covered in these Bid Conditions.
4. Contractors must keep such records and file such reports relating to the provisions of these Bid Conditions as shall be required by the Office of Contract Compliance.
5. Requests for exemptions from these Bid Conditions must be made in writing, with justification, to the Manager of Public Works, 201 W. Colfax, Dept. 608, Denver, Colorado 80202, and shall be forwarded through and with the endorsement of the Director.

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management**

CONTRACT NO. 201735948

CRANMER PARK SUN DIAL TERRACE RENOVATION

CONTRACT

THIS CONTRACT AND AGREEMENT, made and entered into by and between the City and County of Denver, a municipal corporation of the State of Colorado, hereinafter referred to as the "City," party of the first part, and,

**KRISCHE CONSTRUCTION, INC.
605 Weaver Park Road
Longmont, Colorado 80501**

hereinafter referred to as the "Contractor," party of the second part,

WITNESSETH, commencing on **July 17, 2017**, and for at least three (3) days the City advertised that sealed bids would be received for furnishing all labor, tools, supplies, equipment, materials, and everything necessary and required for the following:

<p>CONTRACT NO. 201735948</p> <p>CRANMER PARK SUN DIAL TERRACE RENOVATION</p>

WHEREAS, bids pursuant to said advertisement have been received by the Manager of Public Works, who has recommended that a Contract for said work be made and entered into with the above named Contractor who was the lowest, responsive, qualified bidder therefore, and

WHEREAS, said Contractor is now willing and able to perform all of said work in accordance with said advertisement and its bid.

NOW THEREFORE, in consideration of the compensation to be paid the Contractor, the mutual agreements hereinafter contained, and subject to the terms hereinafter stated, it is mutually agreed as follows:

1. CONTRACT DOCUMENTS

It is agreed by the parties hereto that the following list of documents, instruments, technical specifications, plans, drawings and other materials which are attached hereto and bound herewith, incorporated herein by reference or otherwise referenced in these documents constitute and shall be referred to either as the "Contract Documents" or the "Contract," and all of said documents, instruments, technical specifications, Plans, Drawings and other materials taken together as a whole constitute the Contract between the parties hereto, and they are as fully a part of this agreement as if they were set out verbatim and in full herein:

*Advertisement of Notice of Invitation for Bids
Instructions to Bidders
Commitment to M/WBE Participation
Article III, Divisions 1, 2, and 3 of Chapter 28, D.R.M.C.
Bid Bond
Addenda (as applicable)*

Equal Employment Opportunity Provisions (Appendix A and Appendix F)
Bid Form
Contract Form
General Contract Conditions
Special Contract Conditions
Performance and Payment Bond
Notice to Apparent Low Bidder
Notice to Proceed
Contractor's Certification of Payment Form
Final/Partial Lien Release Form
Certificate of Contract Release
Change Orders (as applicable)
Federal Requirements (as applicable)
Prevailing Wage Rate Schedule(s)
Technical Specifications
Contract Drawings
Accepted Shop Drawings

2. SCOPE OF WORK

The Contractor agrees to and shall furnish all labor, tools, supplies, equipment, materials and everything necessary for and required to do, perform and complete all of the Work described, drawn, set forth, shown and included in said Contract Documents.

3. TERMS OF PERFORMANCE

The Contractor agrees to undertake the performance of the Work under this Contract within ten (10) days after being notified to commence work by issuance of a Notice to Proceed in substantially the form contained herein from the Manager and agrees to fully complete said Work within **270 (Two Hundred Seventy Days)** consecutive calendar days from the effective date of said Notice, plus such extension or extensions of time as may be granted in accordance with the provisions of the General Contract Conditions and any applicable Special Contract Conditions.

4. TERMS OF PAYMENT

The City agrees to pay the Contractor for the performance of all of the Work required under this Contract, and the Contractor agrees to accept as the Contractor's full and only compensation therefore, such sum or sums of money as may be proper in accordance with the price or prices set forth in the Contractor's Bid Form hereto attached and made a part hereof for **bid item numbers 02 40 00-1 through 44 42 80-3 (Seventy-Five[75] total bid items plus 1 add alt**, the total estimated cost thereof being **One Million Nine Hundred Fifty Thousand Six Hundred Fifty-One Dollars and Thirty-Four Cents (\$1,950,651.34)**. Adjustments to said Contract Amount and payment of amounts due hereunder shall be made in accordance with the provisions of the General Contract Conditions and any applicable Special Contract Conditions.

5. NO DISCRIMINATION IN EMPLOYMENT

In connection with the performance of the Work under this Contract, the Contractor agrees not to refuse to hire, discharge, promote or demote, or to discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, gender, age, military status, sexual orientation, marital status, or physical or mental disability; and the Contractor further agrees to insert the foregoing provision in all subcontracts hereunder.

6. COMPLIANCE WITH M/WBE REQUIREMENT

This Contract is subject to all applicable provisions of Divisions 1 and 3 of Article III, of Chapter 28, Denver Revised Municipal Code (D.R.M.C.), designated as Sections 28-31 – 28-36 and 28-52 – 28-90 D.R.M.C. and referred to in this Contract as the "M/WBE Ordinance". Without limiting the general applicability of the foregoing, the Contractor acknowledges its continuing duty, pursuant to Sections 28-72, 28-73 and 28-75 of the D.R.M.C., to maintain throughout the duration of this Contract, compliance with the level of minority and Woman business enterprise participation, upon which the City approved the award of this Contract to the Contractor and the Contractor further acknowledges that failure to maintain such participation commitments or otherwise comply with the requirements of the M/WBE Ordinance shall subject the

Contractor to sanctions in accordance with Section 28-77 of the D.R.M.C. Nothing contained in this provision or in the M/WBE Ordinance shall negate the City's right to prior approval of subcontractors, or substitutes therefore, under this Contract

7. WAGE RATE REQUIREMENTS

In performance of all Work hereunder, the Contractor agrees to comply with and be bound by all requirements and conditions of the City's Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. and any determinations made by the City pursuant thereto.

8. APPLICABILITY OF LAWS

The Agreement between the Contractor and the City shall be deemed to have been made in the City and County of Denver, State of Colorado and shall be subject to, governed by, and interpreted and construed by or in accordance with the laws of the State of Colorado and the Charter, Revised Municipal Code, Rules, Regulations, Executive Orders and fiscal rules of the City. As such, the Contractor shall at all times comply with the provisions of the Charter, Revised Municipal Code, Rules, Regulations, Executive Orders and fiscal rules of the City, and those State of Colorado and Federal Laws, Rules and Regulations, which in any manner limit, control or apply to the actions or operations of the Contractor, any subcontractors, employees, agents or servants of the Contractor engaged in the Work or affecting the materials and equipment used in the performance of the Work, as the same may be, from time to time, promulgated, revised or amended. The Charter and Revised Municipal Code of the City and County of Denver, as the same may be amended from time to time, are hereby expressly incorporated into this Agreement as if fully set out herein by this reference.

9. APPROPRIATION

The amount of money, which has been appropriated and encumbered for the purpose of this contract, to date, is equal to or in excess of the Contract Amount. The Manager, upon reasonable written request, will advise the Contractor in writing of the total amount of appropriated and encumbered funds, which remain available for payment for all Work under the Contract.

The issuance of any change order or other form or order or directive by the City which would cause the aggregate payable under the contract to exceed the amount appropriated for the contract is expressly prohibited. In no event shall the issuance of any change order or other form of order or directive by the City be considered valid or binding if it requires additional compensable work to be performed, which work will cause the aggregate amount available under the Contract to exceed the amount appropriated and encumbered for this Contract, unless and until such time as the Contractor has been advised in writing by the Manager that a lawful appropriation, sufficient to cover the entire cost of such additional work, has been made.

It shall be the responsibility of the Contractor to verify that the amounts already appropriated for this Contract are sufficient to cover the entire cost of such work, and any work undertaken or performed in excess of the amount appropriated is undertaken or performed in violation of the terms of this contract, without the proper authorization for such work, and at the Contractor's own risk.

10. APPROVALS

In the event this Contract calls for the payment by the City of five hundred thousand dollars (\$500,000.00) or more, approval by the Board of Councilmen of the City and County of Denver, acting by ordinance, in accordance with Section 3.2.6 of the Charter of the City and County of Denver, is and shall be an express condition precedent to the lawful and binding execution and effect and performance of this contract.

11. ASSIGNMENT

The Contractor shall not assign any of its rights, benefits, obligations or duties under this Contract except upon the prior written consent and approval of the Manager to such assignment.

12. DISPUTES RESOLUTION PROCESS

It is the express intention of the parties to this Contract that all disputes of any nature whatsoever regarding the Contract including, but not limited to, any claims for compensation or damages arising out of breach or default under this Contract, shall be resolved by administrative hearing pursuant to the provisions of Section 56-106, D.R.M.C., or, as applicable, Section 28-33 D.R.M.C. for Minority and Woman Business Enterprise disputes. The Contractor expressly agrees that this dispute resolution process is the only dispute resolution

mechanism that will be recognized by the parties for any claims put forward by the Contractor, notwithstanding any other claimed theory of entitlement on the part of the Contractor or its subcontractors or suppliers.

13. CONTRACT BINDING

It is agreed that this Contract shall be binding on and inure to the benefit of the parties hereto, their heirs, executors, administrators, assigns and successors.

14. PARAGRAPH HEADINGS

The captions and headings set forth herein are for convenience of reference only and shall not be construed so as to define or limit the terms and provisions hereof.

15. SEVERABILITY

It is understood and agreed by the parties hereto that, if any part, term, or provision of this Contract, except for the provisions of this Contract requiring prior appropriation and limiting the total amount to be paid by the City, is by the courts held to be illegal or in conflict with any law of the State of Colorado, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular part, term or provision held to be invalid.

16. ELECTRONIC SIGNATURES AND ELECTRONIC RECORDS:

Contractor consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

Contract Control Number:

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at Denver, Colorado as of

SEAL

CITY AND COUNTY OF DENVER

ATTEST:

By _____

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

By _____

By _____

By _____



IN WITNESS WHEREOF, the parties have executed this agreement and affixed their seals at Denver, Colorado as of the day first above written.

Contract Control Number: 201735948

Vendor Name: KRISCHE CONSTRUCTIONS, INC.

By: *V. Mark Pilkington*

Name: V. MARK PILKINGTON
(please print)

Title: PRESIDENT
(please print)

ATTEST: [if required]

By: *Krista Toeffler*

Name: KRISTA TOEFFLER
(please print)

Title: SECRETARY
(please print)



**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS**

General Contract Conditions

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CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Capital Projects Management

SPECIAL CONTRACT CONDITIONS

SC-1 CONSTRUCTION SPECIFICATIONS

Except as amended herein or in the attached Technical Specifications, all Work performed under the terms of this Contract shall be governed by the applicable provisions of the following latest editions:

City and County of Denver:

Standard Specifications for Construction, GENERAL CONTRACT CONDITIONS,
2011 Edition.

Transportation Standards and Details for the Engineering Division

City and County of Denver Traffic Standard Drawings

Wastewater Management Division

– *Standard Detail Drawings*

– *Public Works Wastewater Capital Projects Management Standard Construction Specifications*

Colorado Department of Transportation:

Standard Specifications for Road and Bridge Construction
(Sections 200 through 700 of the 2011 Edition)

Federal Highway Administration:

Manual on Uniform Traffic Control Devices for Streets & Highways (MUTCD)

Building & Fire Codes:

Building Code of the City and County of Denver

(International Building Code 2009 Series, City and County of Denver Amendments 2011)

National Fire Protection Association Standards

(As referenced in the Building Code of the City and County of Denver)

The aforementioned City and County of Denver documents are available for review at the Capital Projects Management Office, 201 W. Colfax Ave., Dept. 506, (5th floor), Denver, CO 80202. The *Standard Specifications for Construction, GENERAL CONTRACT CONDITIONS* is available at: <https://www.denvergov.org/content/denvergov/en/contract-administration/contractor-resources.html>. *Transportation Standards and Details for the Engineering Division* and the Wastewater Management Division – *Standard Detail Drawings*, are available at <http://www.denvergov.org>.

The “*Colorado Department of Transportation Standard Specifications for Road and Bridge Construction*” is available for review on CDOT’s website at <http://www.coloradodot.info/> and can be purchased from the Colorado Department of Transportation.

The *Manual on Uniform Traffic Control Devices for Streets & Highways* is available for review at the Federal Highway Administration Website at: www.fhwa.dot.gov. The FHWA website also contains purchasing information.

SC-2 DEPUTY MANAGER / CITY ENGINEER

General condition 109 DEPUTY MANAGER is hereby deleted in its entirety and replaced with the following:

The “Deputy Manager” means the official who reports directly to the Manager and exercises supervisory responsibility in the City agency defined in Title 2 herein that is responsible for the Project. The Manager hereby designates the City Engineer as the Deputy Manager for purposes of this Contract. The City Engineer shall have responsibility for this Project and shall undertake all duties, responsibilities, rights and authority, including specific actions and decisions, delegated to the Deputy Manager under the various terms and conditions of this Contract.

SC-3 ENGINEERING DIVISION / CITY ENGINEER

The Engineering Division is a unit of the Department of Public Works and is supervised by the City Engineer, who is subordinate to the Manager of Public Works. This Division is responsible for the planning, design, construction, operation and maintenance of all of the City's transportation facilities and the planning, design and construction of all of the City’s wastewater facilities, except for the City's Municipal Airport System. All other references to the Transportation Division or the Deputy Manager of Public Works for Transportation are deleted and replaced with references to the Engineering Division and City Engineer, respectively.

SC-4 WASTEWATER MANAGEMENT DIVISION

The Wastewater Management Division is a unit of the Department of Public Works and is supervised by the Deputy Manager of Public Works for Wastewater Management, who is subordinate to the Manager of Public Works. This Division is responsible for the operation and maintenance of the City's wastewater facilities.

SC-5 CITY DELEGATION OF AUTHORITY

With reference to General Contract Condition 109, DEPUTY MANAGER and General Contract Condition 212, CITY’S CONTRACT ADMINISTRATION LINE OF AUTHORITY, the Manager hereby designates the City Engineer as the City official responsible for those certain actions and decisions designated as the responsibility of the Deputy Manager under the General Conditions and delegates to the City Engineer the authority necessary to undertake those responsibilities under this Contract. The Director shall have supervisory responsibility over the Project Manager. Additionally, Contractor questions concerning the Plans and Technical Specifications shall be directed to:

Denver Department of Public Works / Capital Projects Management,

<u>City Project Managers</u>	<u>Telephone</u>
Jennifer Olson, PARKS	(720) 913-0609
Kim D. Blair, P.E. Public Works	(720) 865-3141

<u>Design Consultant</u>	<u>Consultant Contact Name</u>	<u>Telephone</u>
Applied Services, LLC	Mike Holweger, PLA	(303) 841-7077

SC-6 LIQUIDATED DAMAGES

Should the Contractor fail to complete all Work within the Contract Time allocated under the Contract Form at Paragraph 3, TERMS OF PERFORMANCE, the Contractor shall become liable to the City and County of Denver for liquidated damages, and not as a penalty, at the rate of \$500.00 for each Day that the Contractor exceeds the time limits herein specified, all in accordance with provisions of General Contract Condition 602, LIQUIDATED DAMAGES; ADMINISTRATIVE COSTS; ACTUAL DAMAGES.

Representative hourly rates for the City administrative costs described in General Contract Condition 602.2 shall be as follows for this Project:

Project Manager	\$69 per hour
Project Engineer	\$63 per hour
Inspector	\$49 per hour
Surveying, if necessary	\$100 per hour

SC-7 SUBCONTRACTS

In accordance with General Contract Condition 501, SUBCONTRACTS, no limit shall apply to that percentage of the Work, which may be sublet providing that the subcontractors receive prior approval in accordance with General Contract Condition 502, SUBCONTRACTOR ACCEPTANCE.

SC-8 RESERVED

SC-9 PAYMENTS TO CONTRACTORS

The application for payment shall be submitted through Textura® Corporations Construction Management Website. Contractor recognizes and agrees that it shall be required to use the Textura Construction Payment Management System for this Project. Contractor further agrees that, to the fullest extent possible within the CPM System, the City shall be entitled to all non-Confidential records, reports, data and other information related to the project that are available to Contractor through the CPM System, including, but not limited to, information related to Contractor and subcontractor billings. To that end, Contractor agrees that it will activate any available settings within the CPM System that are necessary to grant the City access to such non-Confidential information related to the contract and the project. Applications for payment shall be based on the Contract Unit Prices or the approved Schedule of Values described in GC 903.1

In accordance with General Contract Condition 902, PAYMENT PROCEDURE, the party(ies) responsible for review of all Pay Applications shall be:

<u>Agency/Firm</u>	<u>Name</u>	<u>Telephone</u>
Public Works/Capital Projects Management	Kim Blair, P.E.	(720) 856-3141

In accordance with General Contract Condition 906, APPLICATIONS FOR PAYMENT, each Application submitted shall include the following:

1. The estimate of Work completed shall be based on the approved schedule of values or unit prices, as applicable, and the percent of the Work complete.
2. Each Application for Payment shall include each and every independent subcontractor's payroll information including pay dates and pay amounts.
3. The Contractor shall also submit to the Auditor and other appropriate officials of the City in a timely fashion, information required by General Contract Condition 1004, REPORTING WAGES PAID.
4. Applications for Payment must be accompanied by completed Partial or Final Claim Release Form, as appropriate, from EACH subcontractor and supplier, **AND** the Contractors' Certification of Payment Form (CCP), unless an exception is approved pursuant to General contract condition 907.

The forms, Final/Partial Release and Certificate of Payment (Subcontractor/Supplier) and the Contractor's Certification of Payment (CCP), both of which must be used are attached below. If subcontractor or supplier payments are disbursed via Textura® CPM, those systems generated Release and CCP forms are acceptable.

**DEPARTMENT OF PUBLIC WORKS
Engineering Division**

**FINAL/PARTIAL RELEASE AND CERTIFICATE OF PAYMENT
(SUBCONTRACTOR/SUPPLIER)**

(PROJECT NO. and NAME)	Date: _____, 20__.
(NAME OF CONTRACTOR)	Subcontract #: _____.
(NAME OF SUBCONTRACTOR/SUPPLIER)	Subcontract Value: \$ _____.
Check Applicable Box:	Last Progress Payment: \$ _____.
<input type="checkbox"/> MBE <input type="checkbox"/> WBE	Date: _____.
	Total Paid to Date: \$ _____.
	Date of Last Work: _____.

The Undersigned hereby certifies that all costs, charges or expenses incurred by the undersigned or on behalf of the undersigned for any work, labor or services performed and for any materials, supplies or equipment provided on the above referenced Project or used in connection with the above referenced Subcontract (the "Work Effort") have been duly paid in full.

The Undersigned further certifies that each of the undersigned's subcontractors and suppliers that incurred or caused to be incurred, on their behalf, costs, charges or expenses in connection with the undersigned's Work Effort on the above referenced Project have been duly paid in full.

In consideration of \$_____ representing the Last Progress Payment referenced above and in further consideration of the Total Paid to Date, also referenced above, and other good and valuable consideration received and accepted by the undersigned this ____ day of _____, 20__, the Undersigned hereby releases and discharges the City and County of Denver (the "City"), the above referenced City Project, the City's premises and property and the above referenced Contractor from all claims, liens, rights, liabilities, demands and obligations, whether known or unknown, of every nature arising out of or in connection with the performance of the work effort.

As additional consideration for the payments referenced above, the undersigned agrees to defend, indemnify and save and hold harmless the City, its officers, employees, agents and assigns and the above-referenced Contractor from and against all costs, losses, damages, causes of action, judgments under the subcontract and expenses arising out of or in connection with any claim or claims against the City or the Contractor which arise out of the Undersigned's performance of the Work Effort and which may be asserted by the Undersigned or any of its suppliers or subcontractors of any tier or any of their representatives, officers, agents, or employees.

It is acknowledged that this release is for the benefit of and may be relied upon by the City and the referenced Contractor.

The foregoing shall not relieve the undersigned of any obligation under the provisions of the Undersigned's subcontract, as the subcontract may have been amended, which by their nature survive completion of the Undersigned's work effort including, without limitation, warranties, guarantees, insurance requirements and indemnities.

STATE OF COLORADO) ss. CITY OF _____)	(Name of Subcontractor)
Signed and sworn before me this day of _____, 20__.	By: _____
_____ Notary Public/Commissioner of Oaths My Commission Expires _____	Title: _____



Instructions for Completing the Contractor/Consultant Certification of Payment Form

Office of Economic Development
Division of Small Business Opportunity
Compliance Unit
201 W. Colfax Ave. Dept. 907
Denver, CO 80202
Phone: 720-913-1999
DSBO@denvergov.org

Note: The attached Contractor/Consultant Certification of Payment form must be completed by the Contractor/ Subconsultant and all subcontractors/subconsultant or suppliers used on the project at **any tier** and submitted with each pay application. The Contractor/Consultant is responsible for the accuracy of all information provided and is required to have each subcontractor/subconsultant or supplier fill out the appropriate forms. Please be sure to complete all information requested at the top of the form, including the name of the person who prepared this form.

If you reproduce this form, you must continue to list each of the originally listed firms, as well as any additional firms used during the performance period of the contract. Please complete an additional CCP if there is second tier-ing involved.

If you have any questions, please call the Compliance Unit of DSBO at 720.913.1999.

Instructions for Completing the Contractor/Consultant Certification of Payment Form, per Column

Contractor/Subcontractor or Subconsultant/Supplier Name: In the space provided, list all subcontractors/ subconsultants and suppliers used on the project. For all M/W/S/E/DBEs use the exact name listed in the DSBO Directory.

M/W/S/E/DBE/NON: For each name listed, indicate whether the entity is a certified M/W/S/E/DBE.

Column A: Provide the contract amount, as listed at bid time, for the Contractor/Consultant and each subcontractor/subconsultant or supplier.

Column B: Provide the percentage portion of each listed subcontractor/subconsultant or supplier contract amount (Column A) compared to the total original contract amount in (I).

Column C: Provide the original contract amount (Column A) for each subcontractor/subconsultant or supplier plus any awarded alternate and/or change order amounts applicable. If an alternate/change order does not apply to the listed firm, re-enter the original contract amount (Column A).

Column D: Provide the percent portion of each listed subcontractor/subconsultant or supplier contract amount (Column C) compare to the current total contract amount in (II).

Column E: Provide the amount requested for work performed or materials supplied by each listed subcontractor/subconsultant or supplier for this pay application. The sum of the items in this column should equal the estimated amount requested for this pay application.

Column F: Provide the amount paid to each subcontractor/subconsultant or supplier on the previous pay application. Enter the previous pay application number in the column heading. The sum of the items listed in this column should equal the warrant amount paid to the Contractor/Consultant on the previous pay application. The amounts paid to the subcontractor/subcontractor or suppliers should be the actual amount of each check issued.

Column G: Provide the net paid to date for the Contractor/Subconsultant and each listed subcontractor/subconsultant or supplier.

Column H: Provide the percent portion of the net paid to date (Column G) for the Contractor/Subconsultant and each listed subcontractor/subconsultant or supplier of the current total contract amount in (II).

Rev: 031816

SC-10 CONTRACT FORMS

In accordance with the terms and conditions of the Contract Documents, the City requires the use of certain form documents in complying with or satisfying various obligations, notifications and conditions in contracting with the City or performing Work hereunder. These form documents are referenced by title throughout the Contract Documents for mandatory use as directed. The following are the forms that shall be detached and utilized in accordance with the Contract Documents:

1. Performance and Payment Bond
2. Performance and Payment Bond Surety Authorization Letter (Sample)
3. Final/Partial Lien Release.

The following are forms that will be issued by the City during construction:

1. Notice to Apparent Low Bidder (Sample)
2. Notice to Proceed (Sample)
3. Certificate of Contract Release (Sample)

SC-11 CONSTRUCTION INSPECTION BY THE CITY

General Condition 1701, CONSTRUCTION INSPECTION BY THE CITY, is modified as follows:

.1 Persons who are employees of the City or who are under contract to the City or the City as lessee will be assigned to inspect and test the Work. These persons may perform any tests and observe the Work to determine whether or not designs, materials used, manufacturing and construction processes and methods applied, and equipment installed satisfy the requirements of the drawings and specifications, accepted Shop Drawings, Product Data and Samples, and the General Contractor's warranties and guarantees. The General Contractor shall permit these inspectors unlimited access to the Work and provide means of safe access to the Work, which cost shall be included as a Cost of the Work without any increase to the Guaranteed Maximum Price. In addition, General Contractor shall provide whatever access and means of access are needed to off-site facilities used to store or manufacture materials and equipment to be incorporated into the Work and shall respond to any other reasonable request to further the inspector's ability to observe or complete any tests. Such inspections shall not relieve the General Contractor of any of its quality control responsibilities or any other obligations under the Contract. All inspections and all tests conducted by the City are for the convenience and benefit of the City. These inspections and tests do not constitute acceptance of the materials or Work tested or inspected, and the City may reject or accept any Work or materials at any time prior to the inspections pursuant to G.C. 2002, whether or not previous inspections or tests were conducted by the inspector or a City representative.

.2 Building Inspection will perform building code compliance inspections for structures designed for human occupancy. It is the General Contractor's responsibility to schedule and obtain these inspections. If a code compliance inspection results in identification of a condition which will be at variance to the Contract Documents, the General Contractor shall immediately notify the Project Manager and confirm such notification with formal correspondence no later than forty-eight (48) hours after the occurrence.

.3 When any unit of government or political subdivision, utility or Railroad Corporation is to pay a portion of the cost of the Work, its respective representatives shall have the right to inspect the Work. This inspection shall not make any unit of government or political subdivision, utility or Railroad Corporation a party to the Contract, and shall not interfere with the rights of either party.

SC-12 DISPOSAL OF NON-HAZARDOUS WASTE AT DADS

In accordance with the Landfill Agreement made between the City and Waste Management of Colorado, Inc., bidders will be required to haul dedicated loads (non-hazardous entire loads of waste) to the Denver-Arapahoe Disposal Site ("DADS") for disposal. DADS is located at Highway 30 and Hampden Avenue in Arapahoe County, Colorado. The City will pay all fees associated with such disposal but the bidder shall be responsible for the costs of transporting the loads. Non-hazardous waste is defined as those substances and materials not defined or classified as hazardous by the Colorado Hazardous Waste Commission pursuant to C.R.S. §25-15-101(6), as amended from time to time, and includes construction debris, soil and asbestos. Bidders shall not use Gun Club Road between I-70 and Mississippi Avenue as a means of access to DADS.

SC-13 PROHIBITION ON USE OF CCA-TREATED WOOD PRODUCTS

The use of any wood products pressure-treated with chromated copper arsenate (CCA) is prohibited. Examples of CCA-treated wood products include wood used in play structures, decks, picnic tables, landscaping timbers, fencing, patios, walkways and boardwalks.

SC-14 WAIVER OF: PART 8 OF ARTICLE 20 OF TITLE 13, COLORADO REVISED STATUTES.

The Contractor specifically waives all the provisions of Part 8 of Article 20 of Title 13, Colorado Revised Statutes regarding defects in the Work under this Construction Contract.

SC-15 ATTORNEY'S FEES

Colorado Revised Statute 38-26-107 requires that in the event any person or company files a verified statement of amounts due and unpaid in connection with a claim for labor and materials supplied on this project, the City shall withhold from payments to the Contractor sufficient funds to insure the payment of any such claims. Should the City and County of Denver be made a party to any lawsuit to enforce such unpaid claims or any lawsuit arising out of or relating to such withheld funds, the Contractor agrees to pay to the City its costs and a reasonable attorney's fee which cost shall be included as a Cost of the Work.

Because the City Attorney Staff does not bill the City for legal services on an hourly basis, the Contractor agrees a reasonable fee shall be computed at the rate of one hundred dollars per hour of City Attorney time.

SC-16 INSURANCE

General Condition 1601 is hereby deleted in its entirety and replaced with the following:

(1) **General Conditions:** Contractor agrees to secure, at or before the time of execution of this Agreement, the following insurance covering all operations, goods or services provided pursuant to this Agreement. Contractor shall keep the required insurance coverage in force at all times during the term of the Agreement, or any extension thereof, during any warranty period, and for eight (8) years after termination of the Agreement. The required insurance shall be underwritten by an insurer licensed or authorized to do business in Colorado and rated by A.M. Best Company as "A-"VIII or better. Each policy shall contain a valid provision or endorsement requiring notification to the City in the event any of the required policies be canceled or non-renewed before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement. Such notice shall reference the City contract number listed on the signature page of this Agreement. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal unless due to non-payment of premiums for which notice shall be sent ten (10) days prior. If such written notice is unavailable from the insurer, contractor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the parties identified in the Notices section by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s) and referencing the City's contract number. If any policy is in excess of a deductible or self-insured retention, the City must be notified by the Contractor. Contractor shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Agreement are the minimum requirements, and these requirements do not lessen or limit the liability of the Contractor. The Contractor shall maintain, at its own expense, any additional kinds or amounts of insurance that it may deem necessary to cover its obligations and liabilities under this Agreement.

(2) **Proof of Insurance:** Contractor shall provide a copy of this Agreement to its insurance agent or broker. Contractor may not commence services or work relating to the Agreement prior to placement of coverage. Contractor certifies that the certificate of insurance attached as part of the Contract Documents, preferably an ACORD certificate, complies with all insurance requirements of this Agreement. The City requests that the City's contract number be referenced on the Certificate. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Contractor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. The City's Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

(3) **Additional Insureds:** For Commercial General Liability and Auto Liability, Contractor and subcontractor's insurer(s) shall name the City and County of Denver, its elected and appointed officials, employees and volunteers as additional insured.

(4) **Waiver of Subrogation:** For all coverages, Contractor's insurer shall waive subrogation rights against the City.

(5) **Subcontractors and Subconsultants:** All subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services required by this Agreement) shall be subject to all of the requirements herein and shall procure and maintain the same coverages required of the Contractor. Contractor shall include all such subcontractors as additional insured under its policies (with the exception of Workers' Compensation) or shall ensure that all such subcontractors and subconsultants maintain the required

coverages. Contractor agrees to provide proof of insurance for all such subcontractors and subconsultants upon request by the City.

(6) **Workers' Compensation/Employer's Liability Insurance:** Contractor shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits of \$100,000 per occurrence for each bodily injury claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims. Contractor expressly represents to the City, as a material representation upon which the City is relying in entering into this Agreement, that none of the Contractor's officers or employees who may be eligible under any statute or law to reject Workers' Compensation Insurance shall effect such rejection during any part of the term of this Agreement, and that any such rejections previously effected, have been revoked as of the date Contractor executes this Agreement.

(7) **Commercial General Liability:** Contractor shall maintain a Commercial General Liability insurance policy with limits of \$1,000,000 for each occurrence, \$1,000,000 for each personal and advertising injury claim, \$2,000,000 products and completed operations aggregate, and \$2,000,000 policy aggregate.

(8) **Business Automobile Liability:** Contractor shall maintain Business Automobile Liability with limits of \$1,000,000 combined single limit applicable to all owned, hired and non-owned vehicles used in performing services under this Agreement

(9) **Additional Provisions:**

- (a) For Commercial General Liability, the policies must provide the following:
 - (i) That this Agreement is an Insured Contract under the policy;
 - (ii) Defense costs in excess of policy limits;
 - (iii) A severability of interests or separation of insureds provision (no insured vs. insured exclusion); and
 - (iv) A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City.
- (b) For claims-made coverage:
 - (i) The retroactive date must be on or before the contract date or the first date when any goods or services were provided to the City, whichever is earlier
- (c) Contractor shall advise the City in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limits. At their own expense, and where such general aggregate or other aggregate limits have been reduced below the required per occurrence limit, the Contractor will procure such per occurrence limits and furnish a new certificate of insurance showing such coverage is in force.

SC-17 GREENPRINT DENVER REQUIREMENTS

In accordance with the City and County of Denver Executive Order 123: Greenprint Denver Office and Sustainability Policy, as amended, Contractor shall adhere to sections of Executive Order 123 pertinent to the construction of the built environment. This includes but is not limited to: all construction and renovation of buildings shall follow instructions and memorandum for high performance buildings; horizontal projects shall include the use of fly ash concrete and recycled aggregate where possible; and, all projects shall recycle construction and demolition waste, and install materials that contain recycled content whenever possible using the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) as guidance. Non-hazardous solid waste that is eligible for reuse or recycling is not subject to the DADS disposal requirement defined in SC-12.

A completed "Greenprint Denver Closeout Form for Construction Projects" shall be delivered to the Project Manager as a submittal requirement of Final Acceptance.

<http://www.denvergov.org/constructioncontracts/Home/ContractorResources/tabid/443154/Default.aspx>

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned **KRISCHE CONSTRUCTION, INC. 605 Weaver Park Road, Longmont, Colorado 80501**, a corporation organized and existing under and by virtue of the laws of the State of **CO**, hereafter referred to as the "Contractor", and **Hartford Fire Insurance Company**, a corporation organized and existing under and by virtue of the laws of the State of **CT**, and authorized to transact business in the State of Colorado, as Surety, are held and firmly bound unto the CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereinafter referred to as the "City", in the penal sum of **One Million Nine Hundred Fifty Thousand Six Hundred Fifty-One Dollars and Thirty-Four Cents (\$1,950,651.34)**, lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents;

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT:

WHEREAS, the above bounden Contractor has entered into a written contract with the aforesaid City for furnishing all labor and tools, supplies, equipment, superintendence, materials and everything necessary for and required to do, perform and complete the construction of **CONTRACT NO. 201735948 CRANMER PARK SUN DIAL TERRACE RENOVATION**, Denver, Colorado, and has bound itself to complete the project within the time or times specified or pay liquidated damages, all as designated, defined and described in the said Contract and Conditions thereof, and in accordance with the Plans and Technical Specifications therefore, a copy of said Contract being made a part hereof;

NOW, THEREFORE, if the said Contractor shall and will, in all particulars well and truly and faithfully observe, perform and abide by each and every Covenant, Condition and part of said Contract, and the Conditions, Technical Specifications, Plans, and other Contract Documents thereto attached, or by reference made a part thereof and any alterations in and additions thereto, according to the true intent and meaning in such case, then this obligation shall be and become null and void; otherwise, it shall remain in full force and effect;

PROVIDED FURTHER, that if the said Contractor shall satisfy all claims and demands incurred by the Contractor in the performance of said Contract, and shall fully indemnify and save harmless the City from all damages, claims, demands, expense and charge of every kind (including claims of patent infringement) arising from any act, omission, or neglect of said Contractor, its agents, or employees with relation to said work; and shall fully reimburse and repay to the City all costs, damages, and expenses which it may incur in making good any default based upon the failure of the Contractor to fulfill its obligation to furnish maintenance, repairs or replacements for the full guarantee period provided in the Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if said Contractor shall at all times promptly make payments of all amounts lawfully due to all persons supplying or furnishing it or its subcontractors with labor and materials, rental machinery, tools or equipment used or performed in the prosecution of work provided for in the above Contract and that if the Contractor will indemnify and save harmless the City for the extent of any and all payments in connection with the carrying out of such Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if the said Contractor fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, gasoline, lubricating oils, fuel oils, grease, coal, or any other supplies or materials used or consumed by said Contractor or its subcontractors in performance of the work contracted to be done, or fails to pay any person who supplies rental machinery, tools or equipment, all amounts due as the result of the use of such machinery, tools or equipment in the prosecution of the work, the Surety will pay the same in any amount not exceeding the amount of this obligation, together with interest as provided by law;

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to contracts with others in connection with this project, or the work to be performed thereunder, or the Technical Specifications and Plans accompanying the same, shall in any way affect its obligation on this bond and it does hereby waive notice of any change, extension of time, alteration or addition to the terms of the Contract, or contracts, or to the work, or to the Technical Specifications and Plans.

IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of this

30th day of October, 2017.

Attest:

By: Krista Jeffer
Secretary

Krische Construction, Inc.

Contractor

By: [Signature]

President

Hartford Fire Insurance Company

Surety

By: [Signature]

Attorney-In-Fact
Brandi J. Tetley

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond).

APPROVED AS TO FORM:
Attorney for the City and County of
Denver

By: [Signature]

Assistant City Attorney

APPROVED FOR THE CITY AND COUNTY OF
DENVER

By: [Signature]

MAYOR

By: [Signature]

EXECUTIVE DIRECTOR OF PUBLIC WORKS

POWER OF ATTORNEY

Direct Inquiries/Claims to:

THE HARTFORD
Bond T-4
One Hartford Plaza
Hartford, Connecticut 06155
call: 888-266-3488 or fax: 860-757-5835)

KNOW ALL PERSONS BY THESE PRESENTS THAT:

Agency Code: 34-340140

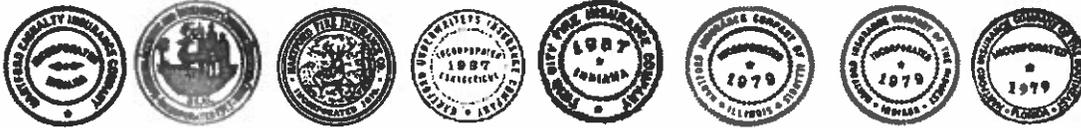
- Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, **up to the amount of Unlimited**

Jennifer L. Clampert, Robert L. Cohen, Sarah Finn, Bradley J. Jeffress, Michael Lischer Jr., Nicole L. McCollam, Kristen L. McCormick, Robert J. Reiter, Sheryll Shaw, Brandi J. Tetley, Sue Wood of DENVER, Colorado

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by , and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on August 1, 2009, the Companies have caused these presents to be signed by its Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.



Wesley W. Cowling

Wesley W. Cowling, Assistant Secretary

M. Ross Fisher

M. Ross Fisher, Vice President

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } ss. Hartford

On this 12th day of July, 2012, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

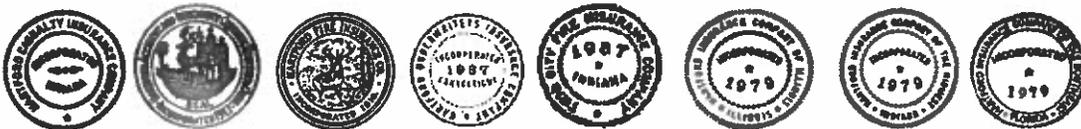


CERTIFICATE

Kathleen T. Maynard

Kathleen T. Maynard
Notary Public
My Commission Expires July 31, 2016

I, the undersigned, Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of
Signed and sealed at the City of Hartford.



Gary W. Stumper

Gary W. Stumper, Vice President



Performance and Payment Bond
Surety Authorization

Fax Number: 720-913-3183
Telephone Number: 720-913-3267

Assistant City Attorney
201 West Colfax Avenue, Dept. 1207
Denver, Colorado 80202

Re: Krische Construction, Inc.

Contract No: 201735948
Project Name: CRANMER PARK SUN DIAL TERRACE RENOVATION
Contract Amount: \$1,950,651.34
Performance and Payment Bond No.: 34BCSHS2494

Dear Assistant City Attorney,

The Performance and Payment Bonds covering the above captioned project were executed by this agency through Hartford Fire Insurance Company, on October 19, 2017.

We hereby authorize the City and County of Denver, Department of Public Works, to date all bonds and powers of attorney to coincide with the date of the contract/.

If you should have any additional questions or concerns, please don't hesitate to give me a call at 303-534-4567.

Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Brandi J. Tetley", written in a cursive style.

Brandi J. Tetley
Attorney-in-Fact



**PERFORMANCE AND PAYMENT BOND
SURETY AUTHORIZATION
(SAMPLE)**

FAX NUMBER: 720-913-3183
TELEPHONE NUMBER: 720-913-3267

Assistant City Attorney
201 W. Colfax Ave. Dept 1207
Denver, Colorado 80202

RE: (Company name)

Contract No: 201735948
Project Name: CRANMER PARK SUN DIAL TERRACE RENOVATION
Contract Amount:
Performance and Payment Bond No.:

Dear Assistant City Attorney,

The Performance and Payment Bonds covering the above captioned project were executed by this agency, through _____ insurance company,
on _____, 20__.

We hereby authorize the City and County of Denver, Department of Public Works, to date all bonds and powers of attorney to coincide with the date of the contract.

If you should have any additional questions or concerns, please don't hesitate to give me a call at

_____.

Thank you.

Sincerely,

Denver Public Works/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw
p. 720.865.8630 | f. 720.865.8795

311 | POCKETGOV.COM | DENVERGOV.ORG | DENVER 8 TV



NOTICE OF APPARENT LOW BIDDER
(SAMPLE)

Current Date

To:

Gentlemen:

The EXECUTIVE DIRECTOR OF PUBLIC WORKS has considered the Bids submitted on August 10, 2017 for work to be done and materials to be furnished in and for:

PROJECT No. 201735948 CRANMER PARK SUN DIAL TERRACE RENOVATION

as set forth in detail in the Contract Documents for the City and County of Denver, Colorado. It appears that your Bid is fair, equitable, and to the best interest of the City and County; therefore, said Bid is hereby accepted at the bid price contained herein, subject to execution of the Contract Documents and your furnishing the items specified below, the total cost thereof (Contract Amount Written), (Contract Amount Numeric).

It will be necessary for you to appear forthwith at the office of the Department of Public Works, Finance and Administration, 201 W. Colfax Ave. Dept 614, Denver, Colorado 80202, to receive the said Contract Documents, execute the same and return them to the Department of Public Works, Finance and Administration, within the time limit set forth in the Bid Proposal.

In accordance with the requirements set forth in the Contract Documents, you are required to furnish the following documents:

- a. Insurance Certificates: General Liability and Automotive Liability, Workman's Compensation and Employer Liability; or any other coverage required by the contract; and
- b. One original plus four copies of the Power of Attorney relative to Performance and/or Payment Bond;

All construction Contracts made and entered into by the City and County of Denver are subject to Affirmative Action and Equal Opportunity Rules and Regulations, as adopted by the Manager of Public Works, and each contract requiring payment by the City of one-half million dollars (\$500,000.00) or more shall first be approved by the City Council acting by ordinance and in accordance with Section 3.2.6 of the Charter of the City and County of Denver.

Prior to issuance of Notice to Proceed, all Equal Opportunity requirements must be completed. Additional information may be obtained by contacting the Director of Contract Compliance at (720-913-1700).

**NOTICE OF APPARENT LOW BIDDER
(SAMPLE)**

PROJECT NO. 201735948

Page 2

The Bid Security submitted with your Bid, will be returned upon execution of the Contract and furnishing of the Performance Bond. In the event you should fail to execute the Contract and to furnish the performance Bond within the time limit specified, said Bid Security will be retained by the City and County of Denver as liquidated damages, and not as a penalty for the delay and extra work caused thereby.

Dated at Denver, Colorado this _____ day of _____ 20____.

CITY AND COUNTY OF DENVER

By _____

_____ Executive Director of Public Works

Denver Public Works/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw
p. 720.865.8630 | f. 720.865.8795

311 | POCKETGOV.COM | DENVERGOV.ORG | DENVER 8 TV



Current Date

**NOTICE TO PROCEED
(SAMPLE)**

Name
Company
Street
City/State/Zip

CONTRACT NO. 201735948, CRANMER PARK SUN DIAL TERRACE RENOVATION

In accordance with General Contract Condition 302 of the Standard Specifications for Construction, General Contract Conditions, 2011 Edition, you are hereby authorized and directed to proceed on _____ with the work of constructing contract number 201735948, as set forth in detail in the contract documents for the City and County of Denver.

With a contract time of _____ calendar days, the project must be complete on or before _____.

If you have not already done so, you must submit your construction schedule, in accordance with General Contract Condition 306.2.B, to the Project Manager within 10 days. Additionally, you must submit your tax exempt certificate, and copies of your subcontractors' certificates, in accordance with General Contract Condition 323.5, to the Project Manager as soon as possible. Failure to submit these certificates will delay processing of payment applications.

Sincerely,

Lesley B. Thomas
City Engineer

cc:

Denver Public Works/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw
p. 720.865.8630 | f. 720.865.8795

311 | POCKETGOV.COM | DENVERGOV.ORG | DENVER 8 TV



Certificate of Contract Release
(SAMPLE)

Date

Name
Company
Street
City/State/Zip

RE: Certificate of Contract Release for
201735948, CRANMER PARK SUN DIAL TERRACE RENOVATION

Received this date of the City and County of Denver, as full and final payment of the cost of the improvements provided for in the foregoing contract, _____ dollars and _____ cents (\$_____), in cash, being the remainder of the full amount accruing to the undersigned by virtue of said contract; said cash also covering and including full payment for the cost of all extra work and material furnished by the undersigned in the construction of said improvements, and all incidentals thereto, and the undersigned hereby releases said City and County of Denver from any and all claims or demands whatsoever, regardless of how denominated, growing out of said contract.

And these presents are to certify that all persons performing work upon or furnishing materials for said improvements under the foregoing contract have been paid in full and this payment to be made is the last or final payment.

Contractor's Signature

Date Signed

If there are any questions, please contact me by telephone at (720) 913-XXXX. Please return this document via facsimile at (720) 913-1805 and mail to original to the above address.

Denver Public Works/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw
p. 720.865.8630 | f. 720.865.8795

311 | POCKETGOV.COM | DENVERGOV.ORG | DENVER 8 TV

CITY AND COUNTY OF DENVER
STATE OF COLORADO



Department of Public Works
Prevailing Wage Rates

Contract No: 201735948



Cranmer Park Sun Dial Terrace Renovation

July 17, 2017



DENVER
THE MILE HIGH CITY

Office of Human Resources
Denver's Human Resource Agency

201 W. Colfax, Department 412
Denver, CO 80202
p: 720.913.5751
f: 720.913.5720
www.denvergov.org/humanresources

TO: All Users of the City of Denver Prevailing Wage Schedules

FROM: Susan Keller, Human Resources Technician

DATE: Monday, June 12, 2017

SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, prevailing wage rates for some building, heavy, and highway construction trades have not been updated by the United States Department of Labor (DOL) since March 1, 2002. The Career Service Board, in their meeting held on April 21, 2011, approved the use of the attached supplemental wage rates until prevailing wage rates for these classifications of work are again published by the United States Department of Labor in accordance with the Davis-Bacon Act.

The effective date for this publication will be **Friday, June 9, 2017** and applies to the City and County of Denver for **HEAVY CONSTRUCTION PROJECTS** in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO170012
Superseded General Decision No. CO20160012
Modification No. 7
Publication Date: 6/9/17
(8 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department of Labor (DOL). The employer and the individual apprentice must be registered in a program, which has received prior approval, by the DOL. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

For questions please call (720) 913-5726.

Attachments as listed above.

General Decision Number: CO170012 06/09/2017 CO12

Superseded General Decision Number: CO20160012

State: Colorado

Construction Type: Heavy

Counties: Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo and Weld Counties in Colorado.

HEAVY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	01/20/2017
2	02/03/2017
3	04/07/2017
4	05/19/2017
5	05/26/2017
6	06/02/2017
7	06/09/2017

ASBE0028-001 07/01/2016

	Rates	Fringes
Asbestos Workers/Insulator (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems).....	\$ 29.73	13.93

BRCO0007-004 01/01/2017

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS AND JEFFERSON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 26.62	7.99

BRCO0007-006 05/01/2017

EL PASO AND PUEBLO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 25.32	9.90

 ELEC0012-004 09/01/2016

PUEBLO COUNTY

	Rates	Fringes
ELECTRICIAN		
Electrical contract over		
\$1,000,000.....	\$ 28.00	11.00+3%
Electrical contract under		
\$1,000,000.....	\$ 24.85	11.00+3%

 ELEC0068-001 06/01/2017

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS,
 JEFFERSON, LARIMER, AND WELD COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 34.70	14.97

 * ELEC0111-001 01/01/2017

	Rates	Fringes
Line Construction:		
Groundman.....	\$ 24.87	22.25%+\$5.75
Line Equipment Operator.....	\$ 30.36	22.25%+\$5.75
Lineman and Welder.....	\$ 43.51	25.25%+\$5.75

 ELEC0113-002 06/01/2017

EL PASO COUNTY

	Rates	Fringes
ELECTRICIAN.....	\$ 31.00	15.38

 ELEC0969-002 06/01/2015

MESA COUNTY

	Rates	Fringes
ELECTRICIAN.....	\$ 24.00	7.92

 * ENGI0009-001 05/01/2017

	Rates	Fringes
Power equipment operators:		
Blade: Finish.....	\$ 27.92	10.10
Blade: Rough.....	\$ 27.60	10.10
Bulldozer.....	\$ 27.60	10.10
Cranes: 50 tons and under..	\$ 27.75	10.10
Cranes: 51 to 90 tons.....	\$ 27.92	10.10

Cranes: 91 to 140 tons.....	\$ 28.55	10.10
Cranes: 141 tons and over...	\$ 29.82	10.10
Forklift.....	\$ 27.22	10.10
Mechanic.....	\$ 28.08	10.10
Oiler.....	\$ 26.84	10.10
Scraper: Single bowl under 40 cubic yards.....	\$ 27.75	10.10
Scraper: Single bowl, including pups 40 cubic yards and over and tandem bowls.....	\$ 27.92	10.10
Trackhoe.....	\$ 27.75	10.10

IRON0024-003 05/01/2017

	Rates	Fringes
Ironworkers:.....	\$ 26.30	21.45
Structural		

LABO0086-001 05/01/2009

	Rates	Fringes
Laborers:		
Pipelayer.....	\$ 18.68	6.78

PLUM0003-005 06/01/2017

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS,
JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 39.08	16.44

PLUM0058-002 07/01/2016

EL PASO COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 35.60	13.65

PLUM0058-008 07/01/2016

PUEBLO COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 35.60	13.65

PLUM0145-002 07/01/2016

MESA COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 35.17	11.70

PLUM0208-004 06/01/2016

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS,
JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 37.10	16.62

SHEE0009-002 07/01/2016		
	Rates	Fringes
Sheet metal worker.....	\$ 32.56	15.96

TEAM0455-002 07/01/2016		
	Rates	Fringes
Truck drivers:		
Pickup.....	\$ 20.16	4.02
Tandem/Semi and Water.....	\$ 20.79	4.02

SUCO2001-006 12/20/2001		
	Rates	Fringes
BOILERMAKER.....	\$ 17.60	
Carpenters:		
Form Building and Setting...	\$ 16.97	2.74
All Other Work.....	\$ 15.14	3.37
Cement Mason/Concrete Finisher...	\$ 17.31	2.85
IRONWORKER, REINFORCING.....	\$ 18.83	3.90
Laborers:		
Common.....	\$ 11.22	2.92
Flagger.....	\$ 8.91	3.80
Landscape.....	\$ 12.56	3.21
Painters:		
Brush, Roller & Spray.....	\$ 15.81	3.26
Power equipment operators:		
Backhoe.....	\$ 16.36	2.48
Front End Loader.....	\$ 17.24	3.23
Skid Loader.....	\$ 15.37	4.41

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Office of Human Resources
Supplemental rates
(Specific to the Denver Projects)
(Supp #74, Date: 02-03-2012)

<u>Classification</u>		<u>Base</u>	<u>Fringe</u>
Ironworkers (Ornamental)		\$24.80	\$10.03
Laborers: Janitors/Yardmen		\$17.68	\$8.22
Laborers:			
	GROUP 1	\$18.18	\$8.27
	GROUP 2	\$21.59	\$8.61
Laborers: (Tunnel)			
	GROUP 1	\$18.53	\$8.30
	GROUP 2	\$18.63	\$8.31
	GROUP 3	\$19.73	\$8.42
	GROUP 4	\$21.59	\$8.61
	GROUP 5	\$19.68	\$8.42
Laborers (Removal of Asbestos)		\$21.03	\$8.55
Line Construction:			
	Lineman, Gas Fitter/Welder	\$36.88	\$9.55
	Line Eq Operator/Line Truck Crew	\$25.74	\$8.09
Millwrights		\$28.00	\$10.00
Power Equipment Operators (Tunnels Above and Below Ground, shafts and raises):			
	GROUP 1	\$25.12	\$10.81
	GROUP 2	\$25.47	\$10.85
	GROUP 3	\$25.57	\$10.86
	GROUP 4	\$25.82	\$10.88
	GROUP 5	\$25.97	\$10.90
	GROUP 6	\$26.12	\$10.91
	GROUP 7	\$26.37	\$10.94
Power Equipment Operators:			
	GROUP 1	\$22.97	\$10.60
	GROUP 2	\$23.32	\$10.63
	GROUP 3	\$23.67	\$10.67
	GROUP 4	\$23.82	\$10.68
	GROUP 5	\$23.97	\$10.70
	GROUP 6	\$24.12	\$10.71
	GROUP 7	\$24.88	\$10.79
Truck Drivers:			
	GROUP 1	\$18.42	\$10.00
	GROUP 2	\$19.14	\$10.07
	GROUP 3	\$19.48	\$10.11
	GROUP 4	\$20.01	\$10.16
	GROUP 5	\$20.66	\$10.23
	GROUP 6	\$21.46	\$10.31

POWER EQUIPMENT OPERATOR CLASSIFICATIONS
(TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES):

GROUP 1 - Brakeman

GROUP 2 - Motorman

GROUP 3 - Compressor

GROUP 4 - Air Tractors; Grout Machine; Gunnite Machine; Jumbo Form

GROUP 5 - Concrete Placement Pumps; Mucking Machines and Front End Loaders, Underground, Slusher; Mine Hoist Operator; Mechanic

GROUP 6 - Mechanic Welder

GROUP 7 - Mole

NOTE: Any equipment listed below being used in tunnel work, below or above ground shall be paid not less than \$2.00 per hour above the listed wage rates.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1 - Air compressor, brakeman, drill operator - smaller than Watson 2500 and similar, operators of 5 or more light plants, welding machines, generators, single unit conveyor, pumps, vacuum well point system, tractor, under 70 hp with or without attachments compressors, 360 C.F.M. or less.

GROUP 2 - Conveyor, handling **building** materials, ditch witch and similar trenching machine, haulage motor man, pugmill, portable screening plant with or without a spray bar, screening plants, with classifier.

GROUP 3 - Asphalt screed, asphalt plant, backfiller, bituminous spreader or laydown machine; cableway signalman, caisson drill, William MF, similar or larger; C.M.I. and similar, concrete batching plants, concrete finish machine, concrete gang saw on concrete paving, concrete mixer, less than 1 yd., concrete placement pumps, under 8 inches, distributors, bituminous surfaces dozer, drill, diamond or core, drill rigs, rotary, churn, or cable tool, elevating graders, elevator operator, equipment, lubricating and service engineer, grout machine, gunnite machine, hoist, 1 drum, horizontal directional drill operator, sandblasting machine, single unit portable crusher, with or without washer, tie tamper, wheel mounted, tractor, 70 hp and over with or without attachments, trenching machine operator, winch on truck.

GROUP 4 - Cable operated power shovels, draglines, articulated truck operator, clamshells, and backhoes, 5 cubic yards and under, concrete mixer over 1 cubic yard, concrete paver 34E or similar, concrete placement pumps, 8 inches and over, grade checker, hoist, 2 drums, hydraulic backhoe, 3/4 yds and over, loader, over 6 cubic yards, mechanic, mixer mobile, multiple unit portable crusher, with or without washer; pile driver, tractor with side boom, roto- mill and similar, welder.

GROUP 5 - Cable operated power shovels, draglines, clamshells and backhoes over 5 cubic yards, caisson drill Watson 2500 similar or larger, hoist 3 drum or more, mechanic – welder (heavy-duty).

GROUP 6 - Cableway, derrick, quad nine push unit, wheel excavator, belt or elevating loader

GROUP 7 - tower cranes all types

LABORER CLASSIFICATIONS:

GROUP 1 –Erosion Control, Dowel Bars; Fence Erectors; Gabion Basket and Reno mattresses; Signaling, Metal Mesh; Stake Caser; Traffic Control Devices; Tie Bars and Chairs in Concrete; Paving; Waterproofing Concrete; Air, Gas, Hydraulic Tools and Electrical Tool Operators; Barco Hammers; Cutting Torches; drill; diamond and core drills; Core, diamond, air track including but not limited to; Joy, Mustang, PR-143, 220 Gardner-**Denver**, Hydrosonic, and water blaster operator; Chuck Tender; Electric hammers; Jackhammers; Hydraulic Jacks; Tampers; Air Tampers; Automatic Concrete Power Curbing Machines; Concrete Processing Material; Concrete Tender; Operators of concrete saws on pavement (other than gangsaws); Power operated Concrete Buggies; Hot Asphalt Labor; Asphalt Curb Machines; Paving Breakers; Transverse Concrete Conveyor Operator; Cofferdams; Boxtenders; Caisson 8' to 12'; Caisson Over 12'; Jackhammer Operators in Caissons over 12'; Labor applicable to Pipe coating or Wrapping; Pipe Wrappers, Plant and Yard; Relining

Pipe; Hydroliner (a plastic may be used to waterproof); Pipelayer on Underground Bores; Sewer, Water, Gas, Oil Conduit; Enamalers on Pipe, inside and out, Mechanical Grouters; Monitors; Jeep Holiday Detector Men; Pump Operators; Rakers; Vibrators; Hydro- broom, Mixer Man; Gunnite Nozzlemen; Shotcrete Operator; and chain saws, gas and electric; Sand Blaster; Licensed Powdermen; Powdermen and Blaster; Siphons; Signalmen; Dumpman/spotter; Grade Checker.

GROUP 2 - Plug and galleys in dams; Scalars; any work on or off Bridges 40' above the ground performed by Laborers working from a Bos'n Chair, Swing Stage, Life Belt, or Block and Tackle as a safety requirement.

TUNNEL LABORER CLASSIFICATIONS:

GROUP 1 - Outside Laborer - Above ground

GROUP 2 - Minimum Tunnel Laborer, Dry Houseman

GROUP 3 - Cable or Hose Tenders, Chuck Tenders, Concrete Laborers, Dumpmen, Whirley Pump Operators

GROUP 4 - Tenders on Shotcrete, Guniting and Sand Blasting; Tenders, core and Diamond Drills; Pot Tenders

GROUP 5 - Collapsible Form Movers and Setters; Miners; Machine Men and Bit Grinders; Nippers; Powdermen and Blasters; Reinforcing Steel Setters; Timbermen (steel or wood tunnel support, including the placement of sheeting when required); and all Cutting and Welding that is incidental to the Miner's work; Tunnel Liner Plate Setters; Vibrator Men, Internal and External; Unloading, stopping and starting of Moran Agitator Cars; Diamond and Core Drill Operators; Shotcrete operator; Gunnite Nozzlemen; Sand Blaster; Pump Concrete Placement Men.

Laborers (Removal of Asbestos) Removal or encapsulation of Asbestos Material (including removal of asbestos from mechanical systems that are going to be scraped) and work involving the removal, handling, or dealing with toxic or hazardous waste.

TRUCK DRIVER CLASSIFICATIONS:

GROUP 1 - Sweeper Truck, Flat Rack Single Axle and Manhaul, Shuttle Truck or Bus.

GROUP 2 - Dump Truck Driver to and including 6 cubic yards, Dump Truck Driver over 6 cubic yards to and including 14 cubic yards, Straddle Truck Driver, Liquid and Bulk Tankers Single Axle, Euclid Electric or Similar, Multipurpose Truck Specialty and Hoisting.

GROUP 3 - Truck Driver Snow Plow.

GROUP 4 - Cement Mixer Agitator Truck over 10 cubic yards to and including 15 cubic yards.

WELDERS: Receive rate prescribed for craft performing operation to which welding is incidental.

CITY AND COUNTY OF DENVER
STATE OF COLORADO



Department of Public Works
Technical Specifications

Contract No: 201735948



Cranmer Park Sun Dial Terrace Renovation

July 17, 2017



Cranmer Park Sun Dial Terrace Reconstruction

2016-PROJMSTR-0000573

Technical Specifications

March 1, 2017

Prepared by:

Applied Design Services L.L.C.

Section Number Section Title

DIVISION 1 - GENERAL REQUIREMENTS

01 11 00	Summary of Work
01 23 00	Alternates
01 25 00	Substitutions
01 29 00	Measurement and Payment
01 29 73	Schedule of Values
01 31 13	Coordination
01 31 19	Project Meetings
01 32 13	Schedule
01 32 19	Submittals
01 33 23	Shop and Working Drawings, Product Data and Samples
01 35 23	Construction Safety
01 42 10	Regulatory Requirements
01 42 16	Definitions and Conventions
01 42 23	Administration, Procedures, Codes
01 43 00	Quality Assurance
01 45 16	Contractor Quality Control
01 50 00	Temporary Facilities
01 57 13	Erosion and Sedimentation Control
01 60 00	Material and Equipment
01 66 00	Storage and Protection
01 71 23	Layout of Work and Surveys
01 74 23	Cleaning
01 77 00	Contract Closeout
01 78 23	Operation and Maintenance Data
01 78 35	Warranties and Bonds
01 78 39	Contract Record Documents
01 99 90	Standard Forms

DIVISION 2 - SITE WORK

02 41 00	Demolition
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DIVISION 3 - CONCRETE

03 30 00	Cast-in-Place Concrete
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DIVISION 31 - EARTHWORK

31 11 00	Clearing and Grubbing
31 20 00	Earth Moving
31 32 50	Watering

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 12 16	Asphalt Pavement
32 13 13	Concrete Walks, Curbs, and Miscellaneous Flatwork
32 80 00	Irrigation Systems
32 91 20	Topsoil
32 92 23	Sodding

DIVISION 33 – UTILITIES

33 46 00	Subdrainage Systems
33 47 00	Front Range Terrazzo Panorama
33 48 00	Stone Pavers

DIVISION 44 – MISCELLANEOUS

44 41 00	Sun Dial Restoration
44 42 00	Interpretive Stone Panels
44 42 20	Donor Recognition Pavers
44 42 40	Site Furniture
44 42 60	Steel Fabrication
44 42 80	Stone Masonry
44 42 90	Drinking Fountain

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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. The Work specified in this contract consists of furnishing all management, supervision, labor, materials, tools, equipment, services, testing, and incidentals for the construction of the Work indicated in the Contract Documents including lump sum items and unit price items.
- B. Reference General Conditions as listed:
 - 1. Article 301 “Consideration (Contractor’s Promise of Performance)”.
 - 2. Article 306 “Working Hours and Schedule”.
 - 3. Title 8 “Protection of Persons and Property”.
 - 4. Article 804 “Protection of Municipal, Public Service, or Public Utility Systems”.

1.3 SITE CONDITIONS

- A. The Contractor acknowledges satisfaction as to the nature and location of the Work, all of the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, water, power, roads, and uncertainties of weather, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during work, and all other matters that can in any way affect the work or the cost thereof under this contract.
- B. The Contractor further acknowledges, by submission of a bid and on each change in work proposal, satisfaction as to the character, quality and quantity of all surface and subsurface materials and all features on top of the surface or at worksites that would be encountered from his inspection of the site and from reviewing available records of exploratory work furnished by the City. Failure by the Contractor to become acquainted with the physical conditions of the sites and all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of performing the Work.
- C. The Contractor warrants that as a result of examination and investigation of all the aforesaid data and the site, that the Contractor can perform the Work in a good and workmanlike manner and to the satisfaction of the City. The City assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this contract unless such representation is expressly stated in the contract.

1.4 DESCRIPTION OF WORK

- A. The following work items are included in these specifications: **[Removal and reconstruction of the Cranmer Park Sun Dial Terrace complete and in place including but not limited to: salvage, storage and reinstallation of all items identified on plan, removal and disposal of**

all items identified on plan and installation of all new work identified on plan including, parking improvements, concrete pavement, curbs, walls and steps, site furniture, stone masonry, terrazzo panorama, interpretive stone panels, sun dial restoration, sub grade construction and sub drainage system installation, irrigation restoration and landscape restoration.] as listed in the Table of Contents of these specifications and as shown per the Contract Drawings. The materials and installation methods specified herein are to be considered standard for all work ordered by and performed for the Department of Parks and Recreation in the construction of new facilities in the parks.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 CONTRACTOR'S DUTIES

- A. Except as otherwise specified, furnish the following to the full extent required by the contract:
 - 1. Labor, superintendence, supervision and products.
 - 2. Construction equipment, tools, machinery and materials.
 - 3. Utilities required for construction and related activities.
 - 4. Other facilities and services necessary to properly execute and complete the Work, including security for worksite, testing and storage and protection of all materials awaiting incorporation into the Work, providing a safe working environment for workers, City representatives, and the public in accordance with all local, state and federal requirements.

- B. Prosecute the Work as specified and in a timely manner. Submit a schedule of Work that will be performed at times other than during the eight-hour working day of Monday through Friday, daylight hours. Submit this schedule five working days prior to the beginning of Work to the Project Manager for review and acceptance. Approval to work at night may be obtained after Contractor presents a written program outlining special precautions to be taken to control the extraordinary hazards presented by night work. That program shall include, but not limited to, supplementary lighting of work areas, availability of medical facilities, security precautions, and noise limitations.
 - 1. Noise Ordinance variances through Denver Department of Environmental Health require several weeks advance public notice and approval is not guaranteed.

3.2 COORDINATION

- A. Coordinate prosecution of the Work with those public utilities, governmental bodies, private utilities and other contractors performing work on and adjacent to the worksites. Eliminate or minimize delays in the Work and conflicts with those utilities, bodies and contractors. Schedule governmental, private utility and public utility work that relies upon survey points, lines and grades established by the Contractor to occur immediately after those points, lines and grades have been established. Confirm coordination measures for each individual case with the City in writing.

- B. In the coordination effort of work by others, the Contractor shall obtain and refer to equipment locations and other layouts, as available, to avoid interface problems.

- C. The City reserves the right to permit access to the site of the Work for the performance of work by other contractors and persons at such times that the City deems proper. The exercise of such reserved right shall in no way or to any extent relieve the Contractor from liability for loss and damage to the work due to or resulting from its operations or from responsibility for complete execution of the Contract. The Contractor shall cooperate with other contractors and persons in all matters requiring common effort.

3.3 CONTRACTOR USE OF WORKSITE

- A. Confine worksite operations to areas permitted by law, ordinances, permits and the contract.
- B. Consider the safety of the Work and that of the people and property on and adjacent to the worksite when determining amount, location, movement and use of materials and equipment on worksite.
- C. Do not load worksite with equipment and products that would interfere with the Work. Only equipment, tools or materials required for this Work may be stored at the worksite.
- D. Protect products, equipment and materials stored on worksite.
- E. Relocate stored products, equipment and materials which interfere with operations of City, government bodies, public and private utilities, and other contractors.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this section including any and all necessary relocations requested by the City. The cost of the work described in this section shall be included in the Contract price.

END OF SECTION 01 11 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if City decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. The project plans and specifications shall be used to achieve the work described under each alternate.

1.5 SCHEDULE OF ALTERNATES

- A. Bid Alternate 1: Drinking Fountain

1. Supply and install drinking fountain per Sheets SDT-11, SDT-12 and Detail F/D1 and Specification Section 44 42 90.
- B. Bid Alternate 2: Stone Paver Salvage
1. Salvage and stockpile 2,300 Sq. Ft. of upper terrace stone pavers. Pavers to be stock piled on site by contractor. Owner will identify pavers to be salvaged.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for each alternate bid item with the exception of drinking fountain service line which will be measured and paid for per linear foot and stone paver salvage which will be paid for per square foot.

4.2 PAYMENT

- A. Payment will be made at the lump sum, linear foot or square foot contract price, and shall include required materials, transportation, equipment, labor, erosion and sediment control, and permits as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 01 23 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 submittal requirements for the approval of a different material, equipment, or process than is described in the Contract Documents.
 - 1. If the substitution changes the scope of work, contract cost or contract time, a Change Order is required.
 - 2. Contract Record Drawings and specifications must include all approved substitutions even if a Change Order is not issued.
- B. Reference General Conditions Article 406 "Substitution of Materials and Equipment".

1.3 QUALITY CONTROL

- A. The substitution must provide the same quality as what it is replacing. The level of quality is defined by:
 - 1. Maintenance and operating cost.
 - 2. Reliability.
 - 3. Durability.
 - 4. Life expectancy.
 - 5. Ease of cleaning.
 - 6. Ability to be upgraded as needed.
 - 7. Ease of interacting with other systems or components.
 - 8. Ability to be repaired.
 - 9. Availability of replacement parts.
 - 10. Established history of use in similar environments.
 - 11. Performance equal or superior to that which it is replacing.

1.4 SUBMITTAL

- A. Refer to Division 01 Sections "Submittals" and "Shop and Working Contract Drawings, Product Data, and Samples" for submittal procedures.
- B. A complete Request for Substitution using the form included in Division 01 Section "Standard Forms" must be made at least sixty (60) days prior to when an order needs to be placed or a method needs to be changed.
- C. The submittal shall contain, as appropriate, detailed product data sheets for the specified items and the substitution. Samples and shop Contract Drawings shall also be submitted of the substitution as applicable. The submittal shall contain all the data required to be submitted for acceptance of the originally specified item or process.

- D. The submittal shall contain all the applicable information required in Article 1.6, below.
- E. A signed statement as outlined in Article 1.7, below, must accompany the Request for Substitution.

1.5 INFORMATION

- A. Provide the following information as applicable with the Request for Substitution on the item or process that is being requested to be substituted:
 - 1. A complete description of the item or process.
 - 2. Utility connections including electrical, plumbing, HVAC, fire protection and controls.
 - 3. The physical dimensions and clearances.
 - 4. A parts list with prices.
 - 5. Samples of color and texture.
 - 6. Detailed cost comparisons of the substitution and the contract specified item or process.
 - 7. Manufacturer warranties.
 - 8. Energy consumption over a one-year period.
 - 9. What local organization is certified to maintain the item.
 - 10. Performance characteristics and production rates.
 - 11. A list of any license fees or royalties that must be paid.
 - 12. A list of all variations for the item or method specified.
 - 13. A list of at least three other projects of similar nature to this contract where the products or methods have been in use for at least one year including telephone number and name of the person to contact at these other projects.
 - 14. An analysis of the effect of the substitution on the schedule and contract cost and on the overall project as it relates to adjoining work.

1.6 SUBSTITUTION REQUEST

- A. The formal Request for Substitution will be evaluated by the Project Manager and the Designer of Record based on the following criteria:
 - 1. Compatibility with the rest of the project.
 - 2. Reliability, ease of use and maintenance.
 - 3. Both initial and long term cost.
 - 4. Schedule impact.
 - 5. The willingness of the Contractor to share equally in any cost savings.
 - 6. The ability of the item or process to meet all applicable governing regulations, rules and laws along with funding agency requirements.
 - 7. The cost of evaluating the substitution.
- B. Based upon the above evaluation the Project Manager will make a final determination of what is in the best interest of the City and either approve, disapprove or approve as noted the requested substitution.

1.7 CONDITIONS

- A. As a condition for submitting a Request for Substitution the Contractor waives all rights to claim for extra cost or change in contract time other than those outlined in the request and approved by the Project Manager. The Contractor, by submitting a Request for Substitution, also accepts all liability for cost and scheduling impact on other contractors or the City due to the substitution.

- B. Included with the Request for Substitution shall be the following statement:
 - 1. “The substitution being submitted is equal to or superior in all respects to the contract-required item or process. All differences between the substitution and the contract-required item or process are described in this request along with all cost and scheduling data.”
- C. The statement shall be signed and dated by the Contractor’s Superintendent.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 25 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 Pay Item descriptions for measurement and payment of Work completed.

1.3 DESCRIPTION**A. General:**

1. NOTE: The Pay Item descriptions listed herein are hypothetical and will vary with each project. Do not prepare pay estimates based on these descriptions.
2. All measurements and payments will be based on work completed in strict accordance with the Drawings and specifications for the project.
3. The method of measurement and basis of payment described are for the work itemized in the Bid Form and in the sections of the specifications. Items may include work within a single section or in more than one section.
4. See the General Conditions for additional information pertaining to measurement and payment. This section is intended to supplement the General and Special Conditions.

B. Measurement:

1. Unless otherwise specified, all longitudinal measurements will be made horizontally, and computations will be based on the dimensions shown on drawings and details. No measurement will be made by weight tickets.
2. Quantities will be rounded off to the nearest whole number.
3. The Contractor shall, in the presence of the Project Manager, verify all measurements and quantities required for payment by the unit price method.
4. Contractor shall provide necessary equipment, workers, and survey personnel as required for measurements.

C. Units:

1. Measurement by Volumes: Measurement by cubic dimension using mean length, width and height or thickness. Longitudinal measurements will be made horizontally.
2. Measurements by Area: Measured by square dimensions using mean length and width or radius, measured horizontally.
3. Linear Measurement: Measured by linear dimension at the item centerline or mean chord.
4. Measured by Lump Sum or Per Each: Item inclusion as specified by the bid item description.

D. Payment:

1. Unit bid prices, as quoted in the Bid Schedule, shall constitute full compensation for labor, materials, equipment, rentals, overhead, profit and incidentals to complete all work for each pay item and for all risk, loss, damage, or expense of whatever nature arising from the nature of the work or prosecution thereof.

2. Work or materials that are essential to the work, but for which there are no pay items, will not be measured and paid for separately, but shall be included in other items of work.
3. Payment for work listed as lump sum bid items completed under this contract shall be paid for on a lump sum fixed price basis.
4. Final payment for work governed by unit prices will be made on the basis of the measurements and quantities accepted by the Project Manager multiplied by the unit price for work which is incorporated in or made necessary by the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

Refer to each specification section for Measurement and Payment information relative to the contents of that section.

END OF SECTION 01 29 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for preparing and submitting the Schedule of Values as referenced in the General Conditions. The Schedule of Values will be built upon a breakdown of the Work using specification sections and milestones. The Work also includes the preparing and submitting of updated copies of the Schedule of Values if the Schedule of Values is affected by change orders.
 - 1. A Schedule of Stored Material is a detailed cost breakdown for permanent materials that will be temporarily stored prior to their being installed and for which the Contractor seeks partial payments. The Schedule of Stored Material will be incorporated as a part of the Schedule of Values.
 - 2. Within fourteen (14) calendar days of issuance of the Notice to Proceed, the Contractor shall submit the Schedule of Values including the Schedule of Stored Material if applicable. The Schedule of Values and Schedule of Stored Material used to prepare the work/cost breakdown for the Schedule of Values will be used for the Contractor's billings.
 - 3. Any contract allowances shall be included in the Schedule of Values. Expenditure of allowances shall be done through the use of the Allowance Authorization form. Use of this form does not increase or decrease the contract value.
- A. Reference the General Contract Conditions as listed:
 - 1. Article 902 "Payment Procedure".
 - 2. Article 903 "Schedule of Values in Lump Sum Contracts".
 - 3. Article 906 "Applications for Payment".
- B. Related Sections:
 - 1. Division 01 Section "Submittals".
 - 2. Division 01 Section "Shop and Working Drawings, Product Data, and Samples".
 - 3. Division 01 Section "Standard Forms".

1.3 DEFINITIONS

- A. Allowance: A monetary amount specified and included in the construction contract for a certain item of work whose details are not yet determined at the time of contracting.

1.4 SUBMITTAL

- A. The Schedule of Values shall be submitted in a format approved by the Project Manager.

- B. The Schedule of Values shall identify each item of work. Work items in the Schedule of Values shall represent all work and shall be referenced with the Technical Specifications section numbers, specification subparagraph, specification section title and the bid item number used for the Schedule of Prices and Quantities when applicable. The Schedule of Values shall address the subcontractor, fabricator or supplier furnishing the materials and or labor for each work item.
- C. Upon request by the City, the Contractor shall support values given with the data which will substantiate the correctness of the values.
- D. The Schedule of Values will be utilized only as a basis for review of the Contractor's application for progress payment on Unit Price Bids. The Schedule of Values will be utilized on a Lump Sum Bid to determine change order costs.

1.5 REVIEW AND RESUBMITTAL

- A. If review by the City indicates that changes to the Schedule of Values are required, the Contractor shall revise and resubmit the Schedule of Values.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARING SCHEDULE OF VALUES

- A. Breakdown of the items used in the Schedule of Values shall include costs as follows:
 - 1. Delivered cost of product with applicable taxes paid.
 - 2. Total installation cost with overhead and profit.
 - 3. Breakdown costs of each lump sum item with a list of products and major operations for which the Contractor seeks to receive progress payments to recover his costs for that bid Item.
 - 4. Each unit price item as listed in the bid Schedule of Prices and Quantities shall list products and major operations for which the Contractor seeks to receive progress payments for that bid item.

3.2 PREPARING SCHEDULE OF VALUES OF STORED MATERIAL

- A. The Contractor shall submit with the Schedule of Values an indication of whether products will be stored on or off the worksite. The Schedule of Stored Material shall show quantities and types of products that will be stored.
- B. Material allowances consist of only the net cost of the product, the cost of delivery and unloading at the storage site, the cost of applicable sales taxes and all discounts.
- C. In no case will the cost paid for a permanent material be greater than ninety percent (90%) of the contract price for the work in which they are included.

3.3 PAYMENT FOR STORED MATERIALS

- A. Only materials that are described in the specifications and on the drawings will be considered permanent materials. Permanent materials are materials that will be left in the work after the contract is completed.
- B. Nothing in these specifications shall be interpreted as requiring the City to pay for stored materials. The Project Manager shall decide on a case-by-case basis whether stored materials shall be paid for. No payment will be made for stored materials which have not been submitted and accepted.
- C. The Contractor must, at all times, store permanent materials in accordance with manufacturer's recommendations. Any material not properly stored will not be paid for. Amounts will be deducted from payments for any stored permanent material previously paid for and subsequently found to be improperly stored or not present, based upon a physical inventory of stored permanent material.
- D. Only the neat line quantity of material needed for the finished product may be paid for.
- E. All requests for stored permanent material payment must be accompanied by paid invoices clearly showing the quantity of permanent material, the type of permanent material and discounts or rebates and the net amount paid to the supplier along with a certificate stating that the permanent material is free of any liens or judgments preventing its use by the City.
- F. All permanent material stored off site, for which payment is being requested must be insured and stored in bonded, insured warehouses.
- G. Any permanent material on which payment is requested must be in such a form that it cannot be used on work other than this contract, or stored in a manner acceptable to the Project Manager to ensure that the permanent material cannot be used on work other than this contract.

3.4 ALLOWANCE AUTHORIZATION AND PAYMENT

- A. Contractor shall request written approval for expenditure of any contract allowances PRIOR TO performing the Work involved. List work to be performed and estimated cost in the requesting correspondence.
- B. Original copies of all invoices and receipts must be submitted with the Allowance Authorization as part of the request for payment.
- C. Using the format provided by the City, the Contractor's request for payment of all contract allowances shall be included in the Schedule of Values.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 29 73

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for project and construction coordination, supervision, and administration for the Work, including but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
 - 5. Utilities and site work.
- B. Reference General Conditions as listed:
 - 1. Title 3 “Contractor Performance and Services”.
 - 2. Article 301 “Consideration (Contractor’s Promise of Performance)”.
 - 3. Article 308 “Communications”.
- C. Related Sections:
 - 1. Division 01 Section “Layout of Work and Surveys”.
 - 2. Division 01 Section “Administration, Procedures, Codes”.
 - 3. Division 01 Section “Project Meetings”.

1.3 GENERAL COORDINATION

- A. General:
 - 1. The Contractor shall ensure that each entity involved in the performance of the Work shall cooperate in the overall coordination of the Work; promptly, when requested by the Contractor, furnish information concerning the entity’s portion of the Work; and respond promptly and reasonably to the decisions and requests of persons designated with coordination, supervisory, administrative, or similar authority.
 - 2. The Contractor shall, 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.
 - 3. Prepare similar memoranda for the Owner and separate Contractors where coordination of their work is required.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction 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

- C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as the City's property.
- D. Site Utilization: In addition to the site utilization limitations and requirements shown on the Contract Drawings and indicated by the Contract Documents, administer the allocation of available space equitably among entities needing access and space, so as to produce the best overall efficiency in the performance of the Work. Schedule deliveries so as to minimize the space and time requirements for storage of materials and equipment on the site; but do not unduly risk delays in the Work.
- E. Coordination Meetings: Include in scheduled meetings, coordination of various entities and activities as set forth in Division 01 Section "Project Meetings". Where necessary, schedule additional coordination meetings for this purpose on an as-needed basis.
- F. Layout: It is recognized that the Contract Documents are diagrammatic in showing certain physical relationships of the various elements and systems and their interfacing with other elements and systems. Establishment and coordination of these relationships is the exclusive responsibility of the Contractor. Do not scale the Contract Drawings. Layout and arrange all elements to contribute to safety, efficiency and to carry the harmony of design throughout the Work. In case of conflict or un-dimensioned locations, verify required positioning with the Project Manager. The Contractor shall provide surveying for the layout of all improvements including both horizontal and vertical control, in accordance with the requirements of Division 01 Section "Construction Surveying".
- G. Substrate Examination: The Contractor shall ensure that the subcontractor of each element of the Work examines the conditions of the substrate to receive the work, dimensions and spaces adjacent, tolerances, interfacing with other elements and services, and the conditions under which the Work will be performed. The Contractor shall require each subcontractor to notify the Contractor in writing of conditions detrimental to the proper or timely completion of the Work, and ensure that they do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the subcontractor.

1.4 COMPLETE SYSTEMS

- A. It is the intent of the Contract Documents that the system be complete and functional to provide the intended or specified performance. The Contractor shall provide all incidental items and parts necessary to achieve this requirement.

1.5 COMPATIBILITY

- A. Provide products and equipment which are compatible with other work requiring mechanical interface including connections, control devices, water, drain and other piping connections. Verify requirements and other interface requirements before ordering equipment and resolve conflicts that may arise.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROCEDURES

- A. Require the subcontractor of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items. Re-check measurements and dimensions before starting each installation.
- C. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- D. Installation:
 - 1. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
 - 2. Install each component during weather conditions and the Work status that will ensure the best possible results. Isolate each part of the completed construction from incompatible materials as necessary to prevent deterioration.
 - 3. Coordinate work with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- E. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Project Manager for final decision.
- F. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Project Manager for final decision.

3.2 CLEANING AND 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 prior to achieving substantial completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 31 13

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for the Contractor, including his field superintendent and quality control representative, to attend meetings scheduled by the City for the collection and dissemination of information related to the subject contract.
 - 1. The Contractor will prepare the minutes of each meeting and distribute them to each of the participants.

1.3 OTHER MEETINGS

- A. The Contractor will be advised of times, dates, and places of contract meetings.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 PRECONSTRUCTION MEETING**

- A. A Preconstruction Meeting will be scheduled by the City after the Contract has been signed by all parties. The purpose of this meeting is to introduce the City's Representatives to their counterparts in the Contractor's organization and to establish lines of communication between the representatives and outline some of the contract requirements. The Contractor's superintendent, and quality control representative(s) shall attend this meeting.
 - 1. The Project Manager will distribute a notice of this meeting, along with an agenda of the subjects to be addressed.
 - 2. The Project Manager will explain and discuss the responsibilities and authorities of the City, the Designer, and the Project Manager's organization.
 - 3. The Project Manager will provide highlights of the following information at this meeting:
 - a. Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) requirements.
 - b. Insurance, laws, codes, traffic regulations, and permit requirements of public agencies and their regulations.
 - c. Procedures for processing change orders.
 - d. Procedures for submitting shop and working drawings, product data and samples.
 - e. Monthly pay estimate cutoff dates.
 - f. Payment procedures.
 - g. Request for information procedures.
 - h. Communication procedures.
 - i. Contractor-required Daily Reports.

- j. Scheduling and coordination requirements.
 - k. Quality Control/Quality Assurance procedures.
 - l. Environmental requirements and permits.
 - m. Milestones for Substantial Completion and Final Acceptance.
 - n. Record documents.
 - o. Project closeout requirements.
- B. The Contractor will introduce the Contractor's representatives and briefly describe each person's responsibilities. The Contractor shall provide the following:
- 1. A list of all subcontractors.
 - 2. Office, storage areas, and construction area layouts, along with temporary easements.
 - 3. Safety, first aid, emergency and security procedures, including the name and contact information for the Contractor's insurance company.
 - 4. 60 day preliminary schedule.
 - 5. Sequence of Work.
 - 6. Construction methods, general worksite layout, and haul plan.
 - 7. Housekeeping procedures.
 - 8. The Contractor's general erosion and sedimentation control plans, noise, hazardous material, air and water pollution control plans, and Quality Control Plan.
 - 9. Coordination and notification requirements for utility work.
 - 10. Deliveries and priorities of major equipment.
 - 11. Submittal schedule.
- C. Explanations provided by the City will not amend, supersede, or alter the terms or meaning of any contract document, and the Contractor shall not claim reliance on such explanations as a defense to any breach or failure by the Contractor to perform as specified in the contract.

3.2 CONSTRUCTION PROGRESS MEETINGS

- A. Progress meetings will be scheduled weekly or more often as necessary by the Project Manager to promote the competent and timely execution of the contract.
- B. The meetings will be held at the worksite or at a location selected by the Project Manager. Meetings will be chaired by the Contractor.
- C. The Contractor's personnel, as listed in Paragraph 3.1.A, above, shall attend unless otherwise agreed by the Project Manager.
- D. The Contractor's Project Manager will be responsible for publishing minutes of the meetings.
- E. At a minimum, the following items will be addressed at each meeting. The items addressed in the meeting do not waive notification or submittal requirements as required elsewhere in the contract.
 - 1. Safety: Contractor shall report any safety issues.
 - 2. Quality Control:
 - a. The Contractor's Quality Control Representative shall present and discuss the Independent Testing Agency weekly test report and/or testing schedule.
 - b. The Contractor's Quality Control representative shall report on inspections by other agencies and any follow-up activity required.
 - c. The Project Manager shall present and discuss issues regarding quality control.

3. Quality Assurance: The Project Manager shall present and discuss issues regarding quality assurance.
4. Design Activities: Open discussion.
5. Shop Drawings / Submittals / Material Procurement:
 - a. The Contractor shall provide and review the submittal schedule and provide any updated information and/or changes to the schedule.
 - b. The Contractor shall provide information on the status of submittals requiring re-submittal.
 - c. The Contractor shall review any accepted submittals that the Contractor plans to re-submit with changes.
 - d. Contractor shall provide the status of material procurement for long-lead items (long-lead items are materials and equipment that have a fabrication and/or delivery duration that exceeds 15 working days).
 - 1) This information shall be provided by the Contractor in a format satisfactory to the City Project Manager and shall include, at a minimum:
 - a) Submittal/shop drawing preparation duration.
 - b) Review duration.
 - c) Fabrication duration.
 - d) Delivery duration.
 - 2) All long-lead items shall be identified with a separate activity on the approved CPM project schedule.
6. Construction Activities: Open discussion to include coordination items with other Contractors and / or agencies.
7. Schedule:
 - a. The Contractor shall provide to the Project Manager the Contractor's three week look-ahead schedule and review at the meeting the items on the schedule. The schedule shall be in bar chart format based on the approved CPM, and shall include dates of testing activities, items in progress, percentage of completion of items, responsible subcontractor for the items.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 31 19

PROJECT MEETINGS
01 31 19 - 3
March 2017

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for the preparation of a preliminary schedule, construction schedule, related narratives, and monthly progress reports, all encompassing complete performance of contract requirements.
- B. The Contractor shall schedule and coordinate the work of all of its subcontractors and suppliers including their use of the worksite. The Contractor shall keep the subcontractors and suppliers informed of the project construction schedule to enable the subcontractors and suppliers to plan and perform their work properly.
- C. The Contractor shall, in accordance with the requirements of the technical specifications, submit a construction schedule that shall provide for the expeditious and practicable execution of the Work.
- D. The construction schedule for the performance of the Work shall be a Critical Path Method (CPM) system in bar chart format, unless an alternate system is specifically identified in the technical specifications.
- E. Float or slack is defined as the amount of time between the early start date and the late start date or the early finish date and the late finish date of any activities in the schedule. Float or slack is not time for the exclusive use or benefit of either the Contractor or the City.
- F. At a minimum, the Contractor shall submit a monthly progress report and schedule update in accordance with the scheduling provisions or as directed by the Project Manager.
- G. The Contractor shall complete the Work within the contract time and in accordance with the most recent schedule submittal that has been approved in writing by the Project Manager.
- H. Reference the General Conditions as listed:
 - 1. Article 306 "Working Hours and Schedule".
 - 2. Article 603 "Delay Damages".
 - 3. Article 909 "Additional Withholding of Progress Payments".
 - 4. Article 1103 "Contractor Change Request".
 - 5. Article 1202 "Submittal of Claims".

1.3 PLANNING

- A. The schedule shall show total contract time, including project milestones, as indicated in the Special Conditions or elsewhere in the contract documents.

- B. The Contractor shall prepare a work plan to complete the work within the contract time and complete those portions of work relating to each milestone date and other contract requirements.
 - 1. The Contractor shall generate a computerized Critical Path Method (CPM) schedule in the Precedence Diagram Method (PDM) format for the Work.
 - 2. The computerized format shall be compatible with the City's Primavera system, version 3.1 or Microsoft Office Project Professional 2003 or later.
 - 3. The Schedule shall be submitted electronically to the Project Manager in a dynamic format which will allow review and manipulation of any part of the schedule, and in reproducible hard copy.
 - 4. The schedule activities shall be resource loaded showing labor man hours by crafts, major construction equipment by type and value of the work.
 - 5. The value of the work shall summarize each pay item shown in the Schedule of Values and balance to their amount.

- C. In addition to the construction activities, the schedule shall include activities for furnishing materials and equipment and vendor shop drawing preparation.
 - 1. The construction schedule, a supporting narrative, and the overall progress curve shall be submitted for approval within thirty (30) days after Notice to Proceed.
 - 2. Within thirty (30) days the City will respond with approval or direction to revise and resubmit within ten days.
 - 3. Failure of the Contractor to have a construction schedule approved by the City will be considered cause for withholding progress payment(s).

- D. To the extent that the construction schedule or any revisions thereof contains anything not jointly agreed upon in writing, or fails to show anything jointly agreed upon in writing, it shall not be considered to have the approval of the City.
 - 1. Failure to include any work item required for performance of this contract shall not excuse the Contractor from completing all work within applicable completion dates, regardless of the City's approval of the schedule.

- E. Failure of the Contractor to comply with this Section will be considered cause for withholding progress payment(s) or termination for default.

1.4 SUBMITTALS

- A. Refer to Division 01 Section "Submittals" for submittal procedures. Submit the following in digital format:
 - 1. Preliminary schedule (with narrative).
 - 2. Construction schedule data and work plan (with narrative).
 - 3. Monthly progress report.
 - 4. Construction schedule change request (as needed).
 - 5. Record construction schedule.

PART 2 - PRODUCTS

2.1 PLOT AND REPORT FORMAT

- A. All sheet sizes shall be either 24 x 36-inches or 36 x 48-inches. They shall contain a title block with a minimum eighteen (18) point font showing:
 - 1. Contractor's name.

2. Contract number and title.
3. Plot date.
4. Data date.
5. Symbol definitions.
6. List of all approved changes to the original approved schedule.

B. Plots shall contain a time line at the top.

PART 3 - EXECUTION

3.1 PRELIMINARY SCHEDULE

- A. The Contractor shall prepare a preliminary schedule covering the first ninety (90) calendar days of the contract. This preliminary schedule shall be submitted at the Preconstruction Meeting and shall be accompanied by a narrative description of the work plan. Within fourteen (14) days, the City will respond with acceptance or direction to revise and resubmit within ten days.
- B. The preliminary schedule shall show all significant work tasks that occur in the first ninety (90) days, including planning, mobilization, shop submittals and approvals, procurement, fabrication and construction. It shall identify work items or milestones that affect or are affected by the City, other Contractor's work, utilities and other third parties, and it shall list major data submittals required by the contract.
- C. The preliminary schedule shall be accompanied by a narrative describing the Contractor's approach to mobilization, procurement and construction during the first 90 days. The narrative shall elaborate on the basis of duration, production rates, major equipment to be used, and shall identify all major assumptions used to develop the schedule.

3.2 CONSTRUCTION SCHEDULE

- A. The construction schedule shall include:
 1. Work items identified in a Work Breakdown Structure (WBS) format that corresponds with the technical specifications.
 2. The order, sequence and interdependence of all significant work items including construction, procurement, fabrication, testing, startup and inspection and delivery of critical or special materials and equipment, submittals and approvals of critical samples, shop drawings, procedures, or other documents that could have a schedule impact.
 3. Work items by the City, other Contractors, utilities and other third parties that may affect or be affected by Contractor's activities.
 4. Proper referencing of all work items to identify applicable subcontractors or other performing parties.
 5. Work items shall be resource loaded to show the direct man-hours estimated to perform the work including work by subcontractors.
 6. Include estimated quantities and production rates, hours per shift, work days per week, and types, number and capacities of major construction equipment to be used and whether the Contractor plans to work weekends or holidays.
- B. The construction schedule shall be prepared to include the data for the total contract duration, and the critical path shall be identified, including critical paths for interim completion dates. Scheduled start or completion dates imposed on the schedule by the Contractor shall be

consistent with contract milestone dates. Milestone events shall be the schedule dates specified in the Special Conditions and shall be prominently identified and connected to the appropriate work item, denoting its start or completion. Work items related to any interim milestones shall be coded for that milestone.

- C. The Contractor shall submit the following documents to the City upon completion of preparation of the construction schedule:
 - 1. A time phased plot of the CPM schedule in PDM format showing all logic ties and an electronic copy in dynamic format.
 - 2. Various computer generated construction schedule reports that contain the following data for each work item: Identification, description, responsibility, duration, early start and early finish, late start and late finish, total float, and resources. The work items shall be sorted by float, early start, subcontractor or other sorts mutually agreed to. The reports shall also show the logic ties of successor and predecessor work items.
 - 3. A physical progress curve showing either manpower or other appropriate key contract items derived from the construction schedule and against which physical progress performance will be measured for schedule and payment purposes.
 - 4. The narrative described in paragraph 3.2.A.7, above.

3.3 PROGRESS REPORTING

- A. The Contractor shall submit a monthly progress report at the end of each month following the Notice to Proceed. At the end of each month, the Contractor and Project Manager shall agree on the progress of the work and the Contractor shall update the construction schedule accordingly. The updated construction schedule is a prerequisite to the submittal of the Contractor's application for progress payment. The schedule shall be made in accordance with Article 3.2, above. This review does not constitute an approval of the construction schedule and shall not be used for the purposes of modifying the initially approved construction schedule.
- B. The Contractor shall submit the monthly progress report consisting of a written narrative and various construction schedule reports. This report will be reviewed in a meeting between the Contractor and Project Manager.
 - 1. The narrative report shall describe overall progress of the work, provide a critical path analysis, discuss significant problems with proposed corrective action, and show the status of major changes and any other changes in sequence of the Work.
 - 2. The construction schedule reports shall include tabular reports showing the status of resources for completed and in progress work items and for work items scheduled to start in the next thirty (30) days. The report shall include all the information outlined in paragraph 3.2.C.2, above.
 - 3. A bar chart format schedule shall be provided showing the Contractor's completion status (progress) on each work item along with plots described in paragraph 3.2.C.1, above.
 - 4. The physical progress curve shall be updated to show actual progress.
- C. The latest completion time for any work item does not fall within the time allowed by the construction schedule, the sequence of work and/or duration shall be revised by the Contractor through concurrent operations, additional manpower, additional shifts or overtime, additional equipment or alternative construction methods until the schedule produced indicates that all significant contract completion dates, occupancy dates and milestones will be met. No additional costs will be allowed if such expediting measures are necessary to meet the agreed completion date or dates except as provided elsewhere in the contract documents.

3.4 SCHEDULE CHANGES

- A. The Contractor's request for construction schedule changes shall be made on the latest approved construction schedule and shall be accompanied by a narrative description and justification for the change, and shall be submitted in accordance with the General Conditions Article 1105 "Time Extensions" on changes in time. Minor revisions submitted at monthly progress review meetings are not considered as changes in this context.
- B. The construction schedule may be changed when one or more of the following occur:
 - 1. When a change order significantly affects the contract completion date or sequence of work items.
 - 2. When the Contractor elects to change the sequence or duration of work items affecting the critical path.
 - 3. When the City directs a change that affects a milestone date(s) specified in the Special Conditions or alters the length of a critical path.
- C. If, after submitting a request for change to the construction schedule, the Project Manager does not agree with the request, the Project Manager will schedule a meeting with the Contractor to discuss the differences. If a settlement cannot be reached on the change in the construction schedule or if the Contractor has failed to submit revisions to the network, the Project Manager has the option of providing suggested logic and/or duration times in all subsequent updating reports. The suggested logic and/or duration times will remain in effect until the change in the construction schedule is settled or until the logic and duration are superseded.
 - 1. If the Contractor has any objections to the data furnished by the Project Manager, he shall advise the Project Manager within ten days in writing, fully supporting the objections with a counter plan. The revisions suggested by the Project Manager shall be used for updating reports until the Project Manager approves the counter plan.
 - 2. If the Contractor does not submit a counter plan and data within ten days after the date of the Project Manager's suggested logic, the Contractor is deemed to concur with the Project Manager's suggested logic/duration time changes. The Project Manager's plan will be the basis of negotiations for any adjustment of the time and cost for performance of the Work.

3.5 CONTRACT EXTENSIONS

- A. If the Contractor is granted an extension of time for completion of any milestone or contract completion date under the provisions of the contract, the determination of the total number of extended days will be based upon the current analysis of the schedule and upon all data relevant to the extension. Such data shall be incorporated in the next monthly update of the schedule.
- B. The Contractor acknowledges and agrees that delays in work items which, according to schedule analysis do not affect any milestone dates or contract completion date shown on the CPM network at the time of the delay will not be the basis for a contract extension.
- C. Weather Delays: Impacts to the project schedule related to abnormal weather conditions will be based on General Conditions Section 1105.3.

3.6 RECORD CONSTRUCTION SCHEDULE

- A. After all contract work items are complete, the Contractor shall submit an Record Construction Schedule showing actual start and finish dates for all work items and milestones.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 32 13

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 summarizes the requirements for the submittal of documents to the City that are defined in these Specifications. It also describes the procedures for “supplemental” submittals.
- B. Reference the General Conditions as listed:
 - 1. Article 309 “Contractor Submittals and other Written Communications to the City”.
 - 2. Article 405 “Shop Drawings, Product Data, and Samples”.

PART 2 - PRODUCTS**2.1 SUBMITTAL SCHEDULE**

- A. The Contractor shall provide a submittal schedule within fourteen (14) days after Notice to Proceed. The Submittal Schedule shall be directly related to the CPM schedule, shall identify all the submittals, and shall include the following information for each submittal item:
 - 1. Specification section, contract article, or special condition.
 - 2. Specification Subparagraph.
 - 3. Item description.
 - 4. Date the submittal shall be submitted.
 - 5. Name of subcontractor or supplier.
- B. The submittal schedule shall be updated every two weeks by the Contractor and submitted with the progress payment request.
- C. One digital submittal submitted on a single CD, USB Drive or by Email.

2.2 ELECTRONIC SUBMITTALS

- A. All submittals shall be delivered to the Project Manger in digital format.
 - 1. Acceptable electronic formats:
 - a. Adobe Acrobat 8.0 or newer. All files shall be fully compatible with Adobe Acrobat 8.0. File shall have no security and bookmark every applicable submittal.
 - 2. Formats are acceptable only with written permission of the Project Manager or required by individual spec sections:
 - a. Microsoft Office 2003 (2007 preferred) or newer. All files shall be fully compatible with Microsoft Office 2003.
 - b. AutoDesk AutoCAD 2007 or newer. All files shall be fully compatible with AutoDesk AutoCAD 2007.

- 1) AutoCAD files shall include any related x-ref files, plot files and pen settings.
- c. Other files pre-approved by the Project Manager.
3. Electronic file names: Each electronic document shall have a unique file name. File name convention shall be as follows unless otherwise agreed to by Project Manager: AAA-BBBBBB-CCC-RZ:
 - a. AAA = sequential submittal number starting at 001.
 - b. BBBBBB = specification section containing submittal requirements.
 - c. CCC = sequential specification submittal number starting at 001.
 - d. RZ = sequential revision number. RZ not required on initial submittals.
 - e. Example A: 005-012973-002”, five submittals have been logged overall with two submittals made to Division 01 Section “Schedule of Values”.
 - f. Example B: 009-012973-002-R3, nine submittals made overall and three revisions to submittal 012973-002.

2.3 INITIAL SUBMITTAL

- A. Each submittal document shall include a title block showing the following information:
 1. Date of submittal and revision dates.
 2. Contract title and number.
 3. The names of Contractor, subcontractor, supplier, manufacturer and when applicable, the seal and signature of an engineer registered in the State of Colorado, for the involved discipline.
 4. Identification of product by either: description, model number, style number or lot number.
 5. Subject identification by contract drawing or specification reference.
- B. On each submitted drawing, include a blank space on each sheet, three inches by four inches, in the lower right corner, just above the title block, in which the Project Manager may indicate the action taken.
- C. Make submissions sufficiently in advance so that the Project Manager review may be completed before any material procurement or Work represented by those submittals is scheduled to be performed.
- D. Allow a minimum cycle of ten (10) working days for review of each submittal by the City.
- E. The Contractor shall at the time of submission describe variations from the contract documents in writing, separate from the submittal document. If the Project Manager approves any such variations, an appropriate contract change order shall be issued except that, if the variation is minor and does not involve a change in price or in time of performance, a modification need not be issued. If a submission contains variations and the variation column is not marked on the transmittal form, it will not be considered for review and acceptance. Along with marking the transmittal as a variation, a description must be included which outlines all the differences including maintenance and utility services along with any cost savings from an item not containing the variation.
- F. Changes in accepted submittal documents will not be permitted unless those changes have been accepted, in writing, by the City.

- G. The form and quality of submittal documents shall comply with Article 2.2, above.

2.4 SUPPLEMENTAL SUBMITTALS

- A. Supplemental submittal documents initiated by the Contractor for consideration of corrective procedures shall contain sufficient data for review. Make supplemental submittals in the same manner as initial submittals with the appropriate primary transmittal referenced.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. The Contractor shall review submittal documents, stamp and sign as reviewed and approved as complying with contract documents prior to submission to the City.

3.2 CITY REVIEW

- A. Submittal documents will be reviewed by the Project Manager for conformance to requirements of the contract drawings and specifications. Review of a separate item will not constitute review of an assembly in which the item functions. The Project Manager will withhold approval of submittals that depend on other submittals not yet submitted. Review and acceptance will not relieve the Contractor from his responsibility for accuracy of submittals, for conformity of submittal document to requirements of contract drawings and specifications, for compatibility of described product with contiguous products and the rest of the system, or for protection and completion of the contract in accordance with the contract drawings and specifications.
- B. The Project Manager will review the submittal documents for general conformance with the contract documents and mark the Action Code, sign and date the transmittal.
- C. The Action Codes have the following meanings:
 1. A - NO EXCEPTIONS TAKEN: no corrections or resubmissions required; fabrication may proceed.
 2. B - MAKE CORRECTIONS NOTED: If Contractor complies with noted corrections, fabrication may proceed and resubmission is not required. If for any reason the Contractor cannot comply with the noted corrections, fabrication shall not proceed and Contractor shall resubmit for additional review and comment.
 3. C - REVISE AND RESUBMIT means that the submittal is unacceptable and must be revised and resubmitted. Fabrication shall not proceed.
 4. E - NOT ACCEPTED Submittal is not in compliance with the Contract Documents, and is not acceptable. Resubmit Contract compliant material.

3.3 CONTRACTOR'S RESPONSIBILITIES

- A. Coordinate each submittal document with the requirements of the Work; place particular emphasis upon ensuring that each submittal of one trade is compatible with other submittals of that trade and submittals of other trades including producing as needed drawings showing the relationship of the work of different trades.

- B. Contractor's responsibility for errors and omissions in submittal documents and associated calculations is not relieved by the City's review, correction and acceptance of submittals.
- C. Contractor's liability to the City, in case of variations in the submittal document from the requirements of the contract documents, is not relieved by the City's review and acceptance of submittals containing variations unless the City expressly approves the deviation in writing, in which the City describes the variation.
- D. The Contractor shall maintain a file of all approved submittal documents at the worksite. The complete file of approved submittal documents shall be turned over to the City with the Record Documents at the end of the job.
- E. Schedule impact due to resubmittal requirements is the responsibility of the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 32 19

SECTION 01 33 23 SHOP AND WORKING DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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 requirements for preparing and submitting shop and working drawings, product data, samples, and record documents required by other specifications sections.
 - 1. The Contractor shall submit all shop and working drawings, product data and samples, as defined in the General Conditions, to the Project Manager in accordance with the requirements in the specifications. The Project Manager will return one copy of the shop and working drawings, and product data to the Contractor with a written transmittal within the time periods noted in the specifications.
- B. Reference the General Conditions as listed:
 - 1. Article 111 "Final Completion".
 - 2. Article 117 "Shop Drawings".
 - 3. Article 405 "Shop Drawings, Product Data, and Samples".

1.3 SUBMITTALS

- A. Refer to Division 01 Section "Submittals" for submittal procedures.
- B. All submittals shall be delivered to the Project Manager in digital format. All submittals must be of a consistent format (all Acrobat or all Word, etc). No combination of digital file types will be allowed unless required by a specific specification section.
 - 1. Acceptable digital formats:
 - a. Adobe Acrobat 8.0 or newer. All files shall be fully compatible with Adobe Acrobat 8.0.
 - b. Formats are acceptable only with written permission of the Project Manager or required by individual spec sections:
 - 1) Microsoft Office 2003 (2007 preferred) or newer. All files shall be fully compatible with Microsoft Office 2003.
 - 2) AutoDesk AutoCAD 2007 or newer. All files shall be fully compatible with AutoDesk AutoCAD 2007.
 - a) AutoCAD files shall include any related x-ref files, plot files and pen settings.
 - 3) Other files pre-approved by the Project Manager.
 - 2. Adobe Acrobat Requirements:
 - a. Drawings shall have security set to "No Security". Commenting, printing, adding photos, filling in form fields, and document signing must be allowed.
 - b. PDF submittals shall be one continuous file. No external links are allowed.
 - c. All individual components of submittals shall be bookmarked inside the PDF file.

- d. All original documents shall be directly converted from the original digital format to PDF. Scanning of files shall only be allowed by the Project Manager when the original digital information is not obtainable.
 - e. Failure to comply with these requirements will result in a return of file to the Contractor for immediate revision.
3. Digital file names: Each digital document shall have a unique file name. File name convention shall be as follows unless otherwise agreed to by Project Manager: AAA-BBBBBB-CCC-RZ.
 - a. AAA = sequential submittal number starting at 001.
 - b. BBBBBB = specification section containing submittal requirements.
 - c. CCC = sequential specification submittal number starting at 001.
 - d. RZ = sequential revision number. RZ not required on initial submittals.
 - e. Example A: 005-012973-002”, five submittals have been logged overall with two submittals made to Division 01 Section “Schedule of Values”.
 - f. Example B: 009-012973-002-R3, nine submittals made overall and three revisions to submittal 012973-002.

C. Quantities:

1. Post digital submittals as PDF digital files directly to the Project Manager, Contractors FTP site, a site specifically established for the Project, or in a digital delivery method agreed to by the Project Manager.
 - a. The Contractor should send an email for each submittal posted to all parties notifying them the submittal is available for review.
 - b. The Project Manager will send an email to the Contractor when the submittal review is complete.
2. Contractor can submit digital submittals via email as PDF digital files if approved by the Project Manager.
3. Samples: Submit four (4) samples of each item specified in the various specification sections, unless otherwise specified.
4. Note: If manufacturer’s printed information is in color, all copies of submittals must be in color.
 - a. Printed information is only allowed when digital copies are not possible.

D. Review:

1. Submittal review comments by the Project Manager will be in digital form and incorporated into the digital submittal file.
2. Comments from Project Manager will be formatted as described in Division 1 Section “Submittals”.
3. Resubmittals of digital documents shall modify the original digital file with new information and include the Project Manager’s comments with appropriate responses and additional information.

1.4 CHANGES

- A. Changes in products for which shop or working drawings, product data or samples have been submitted will not be permitted unless those changes have been accepted and approved in writing by the City.

PART 2 - PRODUCTS

2.1 SHOP AND WORKING DRAWINGS

- A. Include the following as they apply to the subject:
 - 1. Contract title, work order and number.
 - 2. Respective contract drawing numbers.
 - 3. Applicable specification section numbers.
 - 4. Relation to adjacent structure or materials.
 - 5. Field dimensions clearly identified as such.
 - 6. Applicable standards such as ASTM or Federal Specification number, and pertinent authority specifications or standards.
 - 7. Identification of deviations from the Contract drawings and specifications.
 - 8. Drawing name, number, and revision.
 - 9. Contractor's stamp, initialed or signed, certifying:
 - a. Verification of field measurements.
 - b. Review of submittals for compliance with contract requirements.
 - c. Compatibility of the Work shown thereon with that of affected trades.
 - 10. Blank space on each sheet per Division 01 Section "Submittals", paragraph 2.3.B.
- B. Drawings of equipment and other items that contain multiple parts shall include exploded views showing the relationship of parts and the description of the parts into the smallest units that may be purchased or serviced.

2.2 PRODUCT DATA

- A. Modify manufacturer's standard and/or schematic drawings to delete information which is not applicable to the contract. Supplement standard information with additional information applicable to this contract.
- B. Modify manufacturer's standard(s), diagrams, schedules, performance charts, illustrations, calculations and other descriptive data to delete information which is not applicable to the contract. Indicate dimensions, clearances, performance characteristics and capacities. Include with the submittal electrical, plumbing, HVAC and any other diagrams, as applicable.
- C. Modify erection, application and placing instructions to delete information that is not applicable to the contract or work order.
- D. Include the following:
 - 1. Contract title, work order and number.
 - 2. Respective contract drawing numbers.
 - 3. Applicable contract technical specification section numbers.
 - 4. Applicable standards such as ASTM or Federal Specification number, and pertinent authority specification or standards.
 - 5. Identification of deviations from the Contract drawings and specifications.
 - 6. Contractor's stamp, initialed or signed, certifying:
 - a. Dimensional compatibility of the product with the space in which it is intended to be used.
 - b. Review of submittals for compliance with contract requirements.

- c. Compatibility of the product with other products with which it is to perform or which will be next to it.
 - d. The products electrical, plumbing, control and HVAC requirements conform to contract documents and the necessary utilities are provided for in the contract documents.
- E. Certificates of compliance shall be submitted for all products. The certificates shall:
- 1. State that the product complies with the respective specification and contract drawing requirements.
 - 2. Be accompanied by a certified copy of test results pertaining to the product
 - 3. Show the submittals date, Contractor's name and address, contract title and number, product represented and its location in the contract, producer's name, product trade name and catalog number, place of product origin, test date, testing organization's name and address, quantity of the product to be furnished and related contract drawing and specification section numbers.
 - 4. Be signed by an officer or another authorized representative of the producer and notarized.
 - 5. Submit one digital copy.
 - 6. Be received by the City not later than thirty (30) days before the acceptance is needed of the products for ordering.

2.3 SAMPLES

- A. Submit samples of sizes and quantities to clearly illustrate full color range and functional characteristics of products and materials including attachment devices.
- B. Erect field samples and mock ups at the worksite as specified in the several technical specifications sections and at locations acceptable to the Project Manager. All field samples shall be erected in a location that will be readily visible throughout the life of the contract to allow comparison of the work as it progresses to the field sample.
- C. The Contractor shall verify, through appropriate inspections and tests, that the samples submitted meet the specifications and shall provide inspection and test data with the samples. The review and comments on the sample shall not relieve the Contractor of his responsibility for completion of the contract.
- D. Show the following information:
 - 1. Contract title and number.
 - 2. Respective contract drawing numbers.
 - 3. Applicable technical specification section numbers.
 - 4. Applicable standards such as ASTM or Federal Specification number.
 - 5. Identification of deviations from the Contract drawings and specifications.
 - 6. Contractor's stamp, initialed or signed, certifying:
 - a. Dimensional compatibility of the product with the space in which it is intended to be used.
 - b. Review of submittals for compliance with contract requirements.
 - c. Compatibility of the product with other products with which it is to perform or which will be next to it.
 - 7. If multiple samples are submitted and the Project Manager is requested to make a choice, each sample shall have a unique identification number attached to it so the returned

transmittal can state the identification number of the accepted sample and the Contractor will know which one it is.

PART 3 - EXECUTION

3.1 CONTRACTOR RESPONSIBILITIES

- A. Verify field measurements, catalog numbers and similar data.
- B. The Contractor shall not start work for which submittals are required until a transmittal has been received by the Contractor showing acceptance or acceptance as noted by the Project Manager.
- C. Before making submittals ensure that products will be available in the quantities and at the times required by the contract.
- D. Submit final, corrected, digital drawings of contract and shop and working drawings showing the Work as actually installed, placed, erected and applied. Refer to Division 01 Section "Contract Closeout".

3.2 REVIEW BY THE CITY

- A. One digital copy of the marked-up shop and working drawing and one digital copy of the product data will be returned to the Contractor by the Project Manager. Only the transmittal form, appropriately marked, and two samples will be returned on sample submittals. Contractor shall maintain one approved sample on site for the duration of the project.
- B. Contractor's responsibility for errors and omissions in submittals for compatibility will not be reduced, waived or otherwise limited by the review and acceptance of submittals by the City.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 33 23

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for construction safety precautions and programs by the Contractor and the basis for reviews by the Project Manager.
- B. Reference the General Conditions as listed:
 - 1. Article 801 "Safety of Persons".
 - 2. Article 802 "Protective Devices and Safety Precautions".
 - 3. Article 803 "Protection of Property and Work in Progress".

1.3 RESPONSIBILITY

- A. The General Conditions make it clear that all safety precautions during the construction process are the responsibility of the Contractor. The Contractor is responsible for the health and safety of his employees, agents, subcontractors and their employees, and other persons on the worksite; for the protection and preservation of the work and all materials and equipment to be incorporated therein; and for the worksite and the area surrounding the worksite. The Contractor shall take all necessary and reasonable precautions and actions to protect all such persons and property.
- B. This Section shall be interpreted in its broadest sense for the protection of persons and property by the Contractor and no action or omission by the Project Manager or his authorized representatives shall relieve the Contractor of any of its obligations and duties hereunder.

1.4 SUBMITTAL

- A. Refer to Division 01 Sections "Submittals" and "Shop and Working Drawings, Product Data, and Samples" for the process. A safety plan shall be submitted by the General Contractor prior to commencing any work.

1.5 PROJECT MANAGER'S REVIEW

- A. The Contractor shall provide two (2) copies of its safety program to the Project Manager for review at least ten days before on-site construction begins. The Contractor's program must meet as a minimum all applicable federal, state and local government requirements.
 - 1. The Contractor must, as part of the Contractor's safety program, submit one electronic file in the form of a security-free, fully bookmarked PDF file compatible with Adobe Acrobat 8.0 or newer and one body hard copy of the following information for acceptance by the Project Manager prior to construction:
 - a. Name of the Contractor's site safety representative.

- b. If the Contractor is running multiple shifts or working more than forty (40) hours per week, the name of an assistant Contractor's safety representative who can act in the absence of the site safety representative.
 - c. Twenty four (24) hours per day emergency phone numbers of Contractor site management to be used in case of injury or accident. Provide at least four contacts.
 - d. The Contractor's method of ditching and trenching excavation to be used, including how slopes will be stabilized with calculations showing the slope stability.
 - 1) The Contractor shall also show how material will be stored beside the excavation.
 - 2) Stored material will include the excavated and backfilled material.
 - e. How injuries or accidents will be handled including samples of the forms used to report injuries or accidents.
 - f. How employees will be handled who are unable to safely perform their duties, including how the Contractor will determine whether an employee is unable to safely perform his duties.
 - g. How and when equipment will be checked to see that it is safe, that all safety guards are in place and that the equipment is being used for its designed purpose and within its rated capacity.
 - h. How and when all electric devices will be checked for proper grounding and insulation. What system will be used to lock out electric systems that should not be energized.
 - i. How trash and human organic waste will be disposed.
 - j. How snow and ice will be removed within the project area by the Contractor.
 - k. How concrete forms will be anchored to ensure their stability, including calculations showing that the forms will safely hold the maximum construction loads.
 - l. How flammable materials will be stored and handled, and how any spills will be cleaned up and removed for disposal.
 - m. What system will be used to prevent fires, and if fires do occur who will be trained to fight them. Also what firefighting equipment the Contractor will have available and how this equipment's condition will be monitored.
 - n. How materials will be received, unloaded, stored, moved, and disposed of.
 - o. How personnel working above ground level will be protected from falling.
 - p. How people working underneath work will be protected.
 - q. What will be done to protect personnel in case of severe weather.
 - r. How adequate lighting will be provided and monitored.
 - s. How the safety of work platforms, man lifts, material lifts, ladders, shoring, scaffolding, etc. will be ensured relating to load capacity and the protection of personnel using or working around them.
- B. Prior to the start of any work by a contractor or subcontractor employee, the Contractor shall provide the Project Manager with a list of its employees, subcontractor's employees, and other personnel the Contractor has requested to work on site, who have signified in writing that they have been briefed on, or have read and understand, the Contractor's Safety Plan.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S SAFETY PLAN

- A. Provide a Contractor's Safety Program as described in Division 01 Section "Summary of Work".

PART 3 - EXECUTION

3.1 IMPLEMENT CONTRACTOR'S SAFETY PLAN

- A. Implement the approved Contractor's Operational Safety Plan as described in Part 1 of this section.

PART 4 - AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 35 23

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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 identifies primary compliance with the State, and City and County of Denver’s regulatory requirements including:
 - 1. Colorado Department of Transportation (CDOT).
 - 2. Denver Department of Public Works
 - a. The Division of Wastewater Services
 - b. Right of Way Services
 - c. Construction Engineering
 - d. Traffic Engineering
- B. Construction shall be based on the latest edition of the referenced codes including additions and revisions thereto that are in effect at the time of project bidding.

1.3 BUILDING CODE

- A. All design and construction work shall be governed by the Building Code for the City and County of Denver, latest edition. This is based upon the International Building Code of the International Code Council with Denver Amendments to this code.

1.4 DENVER BUILDING DEPARTMENT

- A. For review and approval of all construction documents for compliance to the Denver Building Code:

City and County of Denver
Community Planning and Development
Building Inspection Division
201 West Colfax Avenue, Dept 205
Denver, Colorado 80202
Telephone 720-865-2720
Fax 720-865-2880

1.5 DENVER FIRE DEPARTMENT

- A. For review and approval of plans for compliance with the Denver Fire Department’s requirements as they apply to projects for the Department of Public Works:

Denver Fire Department
745 W. Colfax Ave.
Denver, Colorado 80204

Telephone 720-865-2833

- B. The Contractor is advised that the Denver Fire Department – Fire Prevention Bureau requires permitting for the following activities as they apply to the scope of work. The Contractor is responsible for obtaining the appropriate permits necessary to complete the work. All costs associated with this permitting and policy compliance shall be the responsibility of the Contractor. The policies all reference the International Fire Code (IFC).
 - 1. Hot Work: “Hot work” shall be defined as the operation of any equipment or tool that creates sparks, hot slag, or radiant or convective heat as a result of the work. This includes, but is not limited to, welding, cutting, brazing, or soldering.
 - 2. Use and storage of compressed gas for both temporary storage and permanent facility installation. This includes, but is not limited to, flammable gas (excluding propane-LPG), oxidizer (including oxygen), and inert and/or simple asphyxiates.
 - 3. Tank installation, which includes above-ground storage tanks (AST) and underground storage tanks (UST) for both temporary tanks and permanent facility installations.

- C. In addition to the above permits, the Denver Fire Department may require other permits that are associated with the specific work in the Contract Documents. Policies provided by the Denver Fire Department are meant to provide basic information for the most common conditions and situations. In any given occupancy, many other International Fire Code (IFC) requirements may be enforced. These should be addressed with the Denver Fire Department before construction begins and during construction with premise inspection(s). Any questions can be addressed to the Fire Prevention Bureau between 6:30 A.M. and 9:00 A.M. Monday-Friday at 720-913-8242 or 720-913-8237.

1.6 THE DENVER OFFICE OF DISABILITY (ADA) COMPLIANCE

- A. For review and approval of all construction documents for compliance with the Denver ADA standards*:

City and County of Denver
Human Rights and Community Partnerships
Office of Disability Rights
201 West Colfax Avenue, Dept 1102
Denver, CO. 80202

*Note: Currently the 2010 ADA standards for accessible design and the Transportation Standards and Details for the Engineering Division, Denver Public Works Department, 7.0-7.8 are being used as reference documents to review all plan approval requests.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PERMITS AND CERTIFICATIONS

- A. The Contractor shall maintain records on site of all permits acquired by federal, state, and local agencies. Posting of permits shall conform to requirements of the respective agencies.

- B. At the completion of any inspection by other agencies, the Contractor shall forward copies of the status of the inspection and copies of any approved or “signed-off” inspections by the respective agencies to the Project Manager.
- C. At the time of request for Substantial Completion, the Contractor shall forward to the Project Manager all permits approved by the respective agencies.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 42 10

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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 contains a list of definitions of words or phrases and grammatical or contextual conventions commonly used in these contract documents.

1.3 DEFINITIONS

A. Alphabetical Listing of Definitions

1. As Indicated: Shown on the drawings by graphic indication, notes or schedules, or written in the specifications or elsewhere in the contract documents.
2. As directed, as approved, or as requested: Unless otherwise indicated, these terms imply “by the Project Manager” and require that an instruction be obtained by the Contractor from the Project Manager.
3. Concealed: Embedded in masonry, concrete or other construction; installed in furred spaces; within double partitions or hung ceilings; in trenches; in crawl spaces or in enclosures.
4. Ensure: To make certain in a way that eliminates the possibility of error.
5. Exposed: Not installed underground or “concealed” as defined above.
6. Furnish or Provide: To supply, install and connect complete and ready for safe and regular operation of particular work unless specifically otherwise noted.
7. As Indicated, As Shown, or As Noted: As depicted on drawings or specifications.
8. Install: To erect, mount and connect complete with related accessories.
9. Or equal, or Approved Equal: Refers to products which, in the opinion of the Project Manager, are similar in all respects to products specified by proprietary brand name.
 - a. Refer to Division 01 Section “Substitutions” for procedures for submittal of proposed substitutions.
10. Rework: To repair existing items or work required to be removed and replaced in order to accomplish the Work in accordance with the contract documents.
11. Related Work: Includes, but not necessarily limited to, mentioned work associated with, or affected by, the work specified.
12. Reviewed, Satisfactory, Accepted, or Directed: Assumes by or to the Project Manager.
13. Similar, or Equal: Same in materials, weight, size, design, construction, capacity, performance and efficiency of specified product.
14. Supply: To purchase, procure, acquire and deliver complete with related accessories.
15. Unless Otherwise Indicated and Unless Otherwise Noted: General note to perform work as indicated or shown on drawings or in specifications unless specifically directed otherwise elsewhere in the contract documents; may be abbreviated “U.O.N.”, “U.O.I.”, or “U.N.O.”

1.4 CONVENTIONS

- A. Specifications Format: In order to standardize the location of information in the Contract Documents, the specifications generally are organized in the following format:
 - 1. The 2014 edition of “MASTERFORMAT” published by the Construction Specifications Institute.
- B. Organization of Drawings and Specifications: Organization of the specifications into divisions and sections, and arrangement or numbering of drawings is intended solely for the convenience of the Contractor in his responsibilities to divide the Work among subcontractors or to establish the extent of work to be performed by any trade.
 - 1. Neither the City nor the Project Manager assume any liability arising out of jurisdictional issues or claims advanced by trade organizations or other interested parties based on the arrangement or organization of drawings or specifications.
- C. Gender and Number: For convenience and uniformity, parties to the Contract, including the City, Contractor, and Project Manager, and their subcontractors, suppliers, installers, consultants or other interested parties are referred to throughout the contract documents as if masculine in gender and singular in number. Such reference is not intended to limit the meaning of the contract documents to the masculine gender or singular number.
- D. Singular vs. Plural: Materials, products, equipment or other items of work referred to in the singular shall be construed as plural where applicable by the intent of the contract documents and shall not limit quantities to be provided by the Contractor.
- E. Imperative Mood: Specifications and notes on the Drawings or elsewhere in the contract documents are generally written in the imperative mood as instructions to the Contractor, whether the Contractor is specifically addressed or not.
- F. References to Subcontractors or Trades: References to subcontractors, trades, or other entities which are not parties to the contract shall be construed as meaning the Contractor whose responsibility it shall be to divide the Work among subcontractors or trades. Such references are used as a matter of convention, and are not intended to preclude or direct the Contractor’s responsibility to divide the Work.
- G. Abbreviations: Abbreviations are believed to be those in general use in the construction industry. Contact the Project Manager for clarification of abbreviations for which the meaning is not clear.
 - 1. Review the contract drawings for additional abbreviations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

A. No separate payment will be made for work under this Section.

END OF SECTION 01 42 16

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 general administrative requirements and procedures, and related applicable codes.

1.3 CODES

- A. Obtain all permits and licenses in accordance with General Conditions Article 317 – “Permits and Licenses”.
- B. Publication Dates: Comply with General Conditions Article 401 – “Contract Documents-Review and Interpretation”.

1.4 EXISTING UTILITIES

- A. Locate and protect existing utilities in accordance with General Conditions Article 804 – “Protection of Municipal, Public Service, or Public Utility Systems”.
- B. Although existing utilities may be shown on the drawings, their location is not guaranteed. Contractor is required to call Utility Notification Center of Colorado (UNCC) at 811 three days (72 hours) prior to starting any work.

1.5 CONTRACTOR’S CONSTRUCTION SCHEDULE

- A. Furnish construction schedule, as required by General Conditions Article 306 – “Working Hours and Schedule”.
- B. **IMPORTANT:** Prior to beginning work on project site, the Contractor shall give minimum 48 hour notification to both the Project Manager and the District Superintendent.
- C. The schedule may be used as a tool in analyzing any requests for the extension of the contract completion date due to changes in the Work or abnormal weather conditions. Normal weather conditions are based on the ten-year historical weather information provided by the National Climatic Data Center for the Denver Metropolitan area. Normal weather conditions shall be incorporated into the bar chart schedule. Additional time will be added to the Contract time only if the activities involved will affect the project’s Completion Date because of the criticality of the activities changed or altered.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Properly carton, crate, cover, and protect materials, products and equipment for shipping, handling and storing. Use appropriate means for hoisting and loading which will prevent damage or overstress to items being handled or shipped. Store them under roof in controlled environment whenever feasible; otherwise store off the ground under suitable coverings properly secured against wind and weather. Protect all items from rain, snow, moisture, wind, cold, heat, frost, sun, staining, discoloration, deterioration and physical damage from any cause. Refer to individual sections for specific requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT (Not Used)

END OF SECTION 01 42 23

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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. Quality Assurance is defined as measures, tests, and/or audits that may be performed by the City or City Representatives to ensure the Contractors work is installed per the construction documents and the contractors Quality Control plan.
- B. This Section identifies inspection activities to be performed by inspectors and testing agencies employed by the City and working under the direction of the Project Manager.
 - 1. Inspection and tests, conducted by persons or agencies other than the Contractor, shall not in any way relieve the Contractor of his responsibility and obligation to meet all specifications and the referenced standards.
 - 2. The inspection and approval of work by other agencies above does not constitute inspection or acceptance of work required by the City. Technical specifications may contain requirements more stringent than Building Inspection Division or other code agency requirements.
- C. Reference General Conditions as listed:
 - 1. Article 1701 "Construction Inspection by the City".
 - 2. Article 1702 "Authority of Inspectors".
 - 3. Article 1703 "Observable Defects".
 - 4. Article 1704 "Defects – Uncovering Work".
 - 5. Article 1705 "Latent Defects".
 - 6. Article 1706 "Removal of Defective Materials and Work".
- D. Related Sections:
 - 1. Division 01 Section "Contractor Quality Control".
 - 2. Division 01 Section "Submittals".
 - 3. Division 01 Section "Shop and Working Drawings, Product Data, and Samples".

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 CITY'S QUALITY ASSURANCE MEASURES**

- A. According to the judgment of the Project Manager, any portion of the work in this contract may be tested at any time for any reason.
- B. Contractor shall not rely upon these tests to assure compliance with the Contract Documents.

3.2 TESTING – GENERAL

- A. Tests: Made by testing laboratory approved by the Project Manager. Except as otherwise provided, sampling and testing of materials and laboratory methods and testing equipment shall be in accordance with latest standards and tentative methods of ASTM.
 - 1. Specific information concerning testing methods, sample sizes, etc., is included under applicable sections of Specifications.
 - 2. Any modification of, or elaboration on, these test procedures included for specific materials under their respective sections in Specifications shall take precedence over these procedures.

3.3 COST OF TESTING

- A. Unless indicated otherwise, additional testing required by the City's Agents shall be performed by the City's authorized agents, at the City's expense.
- B. Costs for testing shall be borne by the Contractor only if such tests indicate that work does not meet Contract Document requirements.
- C. Costs for re-testing of non-complying work shall be borne by the Contractor.

3.4 TEST REPORTS

- A. Test reports, whether performed for the City or the Contractor, shall be submitted to the Project Manager and Contractor as soon as results are available. Reports shall be clear, concise, comprehensive written forms containing required test results.
- B. Reports of tests made by testing laboratories shall be distributed by testing laboratory as follows:
 - 1. Two (2) Copies – Project Manager.
 - 2. One (1) Copy – Contractor.
 - 3. One (1) Copy – Applicable Supplier or Subcontractor.

3.5 MANUFACTURING AND FABRICATION INSPECTIONS

- A. The Project Manager may elect to perform additional inspections and/or tests at the place of the manufacturer, the shipping point, or at the destination to verify conformance to applicable specifications. Inspections and tests performed by the City shall not relieve the Contractor from the responsibility to meet the specifications, nor shall such inspections/tests be considered to be a guarantee for acceptance of materials that will be delivered at a later time.
- B. The Project Manager or his authorized representative may inspect at its source any material or assembly to be used in the Work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the Work and to obtain samples for testing and further inspection.
- C. Should the Project Manager conduct plant inspections the following conditions shall exist:
 - 1. The Project Manager shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.

2. The Project Manager shall have full access during scheduled production or warehousing working hours to parts of the plant that are concerned with the manufacture, production, storage or shipping of materials being furnished.
 3. The Contractor shall arrange for adequate office or working space that can reasonably be needed for conducting a plant inspection. Office or working space shall be conveniently located with respect to the plant and/or warehouse as required by the Project Manager.
- D. It is understood and agreed that the City shall have the right to re-test, at the City's expense, any materials that have been tested and accepted at the source of supply after it has been delivered to the site.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 43 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 identifies the Quality Control activities to be performed during all phases of the contract by the Contractor. Quality Control is defined as the process by which the Contractor ensures the project is constructed per the construction documents.
- B. The Contractor shall have in place his Quality Control Program as necessary to ensure that all materials and work are completed in compliance with contract documents. The Contractor is solely responsible for Quality Control. The City reserves the right to conduct additional tests or audits to verify compliance per Division 1 section "Quality Assurance".
- C. Test schedules and/or testing requirements for materials used on this project are included in the technical specifications. Laboratory and field testing identified in the technical specifications shall be conducted by an Independent Testing Agency (ITA) retained by the Contractor.

1.3 LEVEL OF CONTROL

- A. The intent of this section is to enable the Contractor to establish a necessary level of control that will:
 - 1. Adequately provide for the production of acceptable quality materials.
 - 2. Provide sufficient information to ensure both the Contractor and the Project Manager that the specification requirements are being met.
 - 3. Allow the Contractor as much latitude as possible to develop his or her own standards of control.

1.4 SUBMITTALS

- A. Refer to Division 01 Sections "Submittals" and "Shop and Working Drawings, Product Data, and Samples", for submittal requirements.
- B. Quality Control Plan: Within ten (10) days after Notice to Proceed, the Contractor shall submit a Quality Control Plan for review and acceptance. Acceptance by the Project Manager does not relieve the Contractor of compliance with the contract requirements. The Contractor Quality Control Plan shall address the following as a minimum:
 - 1. Provide a general description of Quality Control monitoring to be performed until final acceptance by the City. Include monitoring activities of Work and the worksite during times no construction activity is scheduled to take place.
 - 2. The Contractor shall designate an employee as the Quality Control Representative qualified to perform quality control monitoring of the Work. The designated individual shall have the authority to direct work changes required to bring the Work into

- conformance with contract requirements including stopping non-conforming work in progress.
3. The Quality Control Plan shall address each technical specification division's requirements for quality control. The Contractor shall identify each item requiring submittal and approval/acceptance prior to installation of work. Also, the Contractor shall identify each item of work requiring testing by the independent testing agency.
 4. The Quality Control Plan shall address and establish controls and documentation format to ensure that items or materials that have been accepted through receiving inspection are used or installed. Identification and traceability shall be provided throughout all inspections, test activities and records. For stored items, provisions shall be made for the control of item/material identification, consistent with the expected duration and type of storage.
 5. Provide methodology of monitoring, testing and exercising of all equipment, valves and/or assemblies to ensure the Work installed is in proper working order.
- C. List of Suppliers and Subcontractors: Submit a list of suppliers and subcontractors, including items to be supplied by each supplier and/or subcontractor. Identify work to be performed by each subcontractor. The list shall be updated and resubmitted as required.
- D. Emergency Contact List: Submit a list of emergency contact information including name, company, title, work phone number, home phone number, and other means of contact for at least four individuals.
1. Review the Emergency Contact list on a daily basis. In the event there is any change in any of the information, the Contractor shall forward the updated list to the Project Manager.
 2. The Emergency Contact list shall include the project number, project title, and date of issue.
- E. Quality Control Report:
1. The Quality Control Report shall be submitted weekly or per the discretion of the Project Manager in the format detailed in Division 01 Section "Standard Forms". The report shall address as a minimum the following: identify notifications and discussions with/by other agency inspectors, identify work placed that day and any deviations and/or corrections required to bring the Work into conformance with the contract. Reporting must be digital format and signed by the Contractors Quality Control Representative. Legible, hand written reports on the approved form shall be accepted. Scanned copies of daily reports are acceptable.
 2. Submit one electronic copy of the Quality Control Report to the Project Manager the week following the work or per the discretion of the Project Manager. The report shall be signed by the Contractor's Quality Control Representative and the Contractor's Superintendent.
- F. Corrective Action Report (CAR): Conditions adverse to quality will be reviewed by the Contractor and the City Representative to determine the cause and to recommend a corrective action that will preclude recurrence.
1. The condition, its cause, and the corrective action planned shall be reported to the Project Manager prior to implementation.
 2. Follow-up action shall be taken to verify implementation of the corrective action.
 3. The Contractor will document the corrective action and a copy of the Corrective Action Report (CAR) will be transmitted to the Project Manager.

1.5 DOCUMENTATION

- A. The Contractor shall not change or alter approved submittals, procedures, specifications, drawings, or other pertinent documentation without the Project Manager's written authorization.
- B. All records and documents that are quality related shall be prepared, identified, and maintained by the Contractor and shall be made available to the City upon request. Records shall be protected from damage, deterioration or loss. A copy of the records and documents shall be maintained at the Work site at all times unless the Project Manager has approved other locations in writing. .
- C. The Contractor shall maintain records at the actual worksite and at Contractor's office to show the inspection status of materials and items installed in order to ensure that the required inspections and tests have been performed in a timely and correct manner.

1.6 INSPECTIONS AND TESTS

- A. Inspections, tests, and system shut down requests, conducted by persons or agencies other than the Contractor, shall not in any way relieve the Contractor of his responsibility and obligation to meet all specifications and the referenced standards. The Contractor's designated Quality Control Representative shall inspect the work and shall ensure the work complies with the contract requirements prior to any requests for inspection or testing.
- B. When the specifications, laws, ordinances, rules, regulations or orders of any public agency having jurisdiction require the Project Manager's surveillance of inspections or tests, the Contractor shall notify the Project Manager of the place, date and time forty eight (48)-hours prior to the inspection and/or test. The Contractor shall be responsible for notifying and requesting inspection by other agencies including but not limited to the Denver Building Inspection Division, Denver Fire Department, Denver Wastewater Management Division and Denver Water. Prior to request for other agency inspections, the Contractor shall meet and plan inspection times with the Project Manager and or his designated representative.
- C. Special inspections or tests may be required by the technical specifications, City, State and/or Federal Agencies in addition to those tests already performed. The Contractor shall notify the Project Manager at least forty eight (48)- hours in advance of the additional inspections or tests.

1.7 INSPECTION PLAN

- A. The Contractor shall utilize the following six-point inspection plan to ensure the conformance of the Work performed by the Contractor meets the requirements of the contract drawings and specifications, the referenced codes and standards and the approved submittals:
 - 1. Pre-work Coordination: Prior to the start of construction work, work under each separate specification section, where a change in a construction operation is contemplated by the Contractor, and a new subcontractor starting work, a coordination meeting will be held with the Contractor's superintendent, Quality Control, and Safety representative(s), and the ITA representative. Supervisory, Safety, and Quality Control representatives of all applicable subcontractors shall also attend. The Contractor's Quality Control Representative shall chair the meeting, and prepare and distribute minutes of Quality Control meetings. Meeting minutes shall be electronically distributed within twenty four (24) - hours of the meeting.

2. The purpose of the meeting is to ensure that the Contractor's personnel have no misunderstandings regarding their safety and quality procedures as well as the technical requirements of the contract. The following items shall be presented and reviewed by the Contractor:
 - a. Contract requirements and specifications.
 - b. Shop drawings, certifications, submittals and Record Drawings.
 - c. Testing and inspection program and procedures.
 - d. Contractor's Quality Control program.
 - e. Familiarity and proficiency of the Contractor's and subcontractor's workforce to perform the operation to required workmanship standards including certifications of installers.
 - f. Safety, security, and environmental precautions to be observed.
 - g. Any other preparatory steps dependent upon the particular operation.
 - h. The Contractor's means and methods for performing the Work.
3. Initial Inspection: Upon completion of a representative sample of a given feature of the Work and no later than two weeks after the start of a new or changed operation, the Project Manager and/or his designated representative will meet with the Contractor's Quality Control representative and applicable subcontractor's supervisor and their Quality Control representatives to check the following items, as a minimum:
 - a. Workmanship to established quality standards.
 - b. Conformance to contract drawings, specifications and the accepted shop drawings.
 - c. Adequacy of materials and articles utilized.
 - d. Results of inspection and testing methods.
 - e. Adequacy of Record Drawings maintained daily.
4. Once accepted, the representative sample will become the physical baseline by which ongoing work is compared for quality and acceptability. To the maximum practical extent, approved representative samples of work elements shall remain visible until all work in the appropriate category is complete. Acceptance of a sample does not waive or alter any contract requirements or show acceptance of any deviation from the contract not approved in writing by the Project Manager.
5. Follow-up Inspection: The Contractor's Quality Control representative will monitor the work to review the continuing conformance of the work to the workmanship standards established during the preparatory and initial inspections.
6. Completion Inspection: This is not an acceptance inspection. Forty eight (48) - hours prior to the completion of an item or segment of work and prior to covering up any work, the Contractor will notify the Project Manager who will verify that the segment of work is substantially complete, all inspections and tests have been completed and the results are acceptable.
 - a. The purpose of this inspection is to allow further corrective work upon, or integral to, the completed segment of work.
 - b. If any items are determined to be deficient, need correction or are non-conforming, a Deficiency List will be prepared and issued to the respective Contractor for correction, repair or replacement of any deficient or non-conforming items.
 - c. The Project Manager and Contractor's Quality Control representative will verify the correction of the deficient and/or non-conforming items prior to the start of the next operation.

7. Substantial Completion Inspection: Prior to requesting a Substantial Completion Inspection by the City, all work and operational systems to be inspected shall be satisfactorily completed and tested by the Contractor.
 - a. The Contractor's written request for this inspection shall be made seventy two (72) - hours in advance.
 - b. With the request shall come a list of any known deficiencies and when they will be corrected.
 - c. If the list is too large or contains too many significant items, in the opinion of the Project Manager, no inspection will be held because of the incompleteness of the work.
8. The Contractor will schedule the Substantial Completion Inspection and will prepare a list of deficient items (punch list) discovered during the inspection.
 - a. If during the inspection the list becomes too large or too many significant items are on the list, the inspection will be canceled.
 - b. After the inspection is completed, the Deficiency List will be transmitted to the Project Manager identifying all deficient items.
9. Final Acceptance Inspection: After the Contractor has completed all items on the Deficiency List (generated from the Substantial Completion Inspection) he shall request a Final Acceptance Inspection. The request shall be made in writing at least seventy two (72) hours in advance of the inspection.
 - a. All areas must be cleaned and ready for turnover prior to this inspection. The Project Manager, the design consultant, a representative of the funding agency (if applicable) and other interested parties will inspect the subject Work to ensure that all deficiencies have been satisfactorily attended to and that no new deficiencies have appeared and that all systems are completely functional.
 - b. Any outstanding or additional deficient items will be noted and handled per the requirements of the Substantial Completion Inspection noted above until the Work is acceptable to the Project Manager.

1.8 SAMPLES

- A. The Contractor shall maintain at the worksite a copy of all samples submitted and accepted by the City. Samples shall be made available to the designer or the Project Manager's designated representatives for review and comparison in the field. The Project Manager prior to use on the project must accept all items and materials.
- B. The installed work will be compared to the samples and if any of the work is not of the same quality, material, finish, color, texture or appearance as the sample, that portion that is not the same will be considered defective and in nonconformance.
- C. Contractor selection of samples will only be considered if taken at random. The Contractor shall permit representatives of the City to witness the selection of samples. Inspection or tests of items or materials that fail shall be sufficient cause to terminate further inspections/tests of the same brand, make or source of that product.
- D. The Contractor is obligated to correct any item deemed deficient.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REQUIREMENTS

- A. The Contractor is responsible for Quality Control of the Construction. All acquisition of materials, sequence of construction (except as otherwise indicated), and means and methods of construction shall be the responsibility of the Contractor. Establish system to perform sufficient inspection and tests of all items of work, including that of subcontractors, to ensure conformance to Contract Documents for materials, workmanship, construction, finish, functional performance and identification.
1. Control System: Establish for all construction except where Contract Documents provide for specific compliance tests by testing laboratories and engineers employed by the City.
 2. Control System: Specifically include all testing required by various sections of Specifications.
 3. Quality Control System: Means by which Contractor assures himself that construction complies with requirements of Contract Documents.
 - a. Controls: Adequate to cover all construction operations and keyed to proposed construction schedule.
- B. All materials required for the contract shall be new except where specified otherwise. The Project Manager may elect to perform additional inspections and/or tests at the place of the manufacture, the shipping point or at the destination to verify conformance to applicable specifications. Inspections and tests performed by the City shall not relieve the Contractor from the responsibility to meet the specifications, nor shall such inspections/tests be considered a guarantee for acceptance of materials that will be delivered at a later time.
- C. The Contractor is obligated to correct or remove non-conforming materials, whether in place or not. If necessary, the Project Manager will send written notification to the Contractor to correct or remove the defective materials from the project. If the Contractor fails to respond, the Project Manager may order correction, removal and/or replacement of defective materials by others, in which case the Contractor shall bear all costs incurred by such actions.
- D. Materials accepted on the basis of a Certificate of Compliance may be sampled and inspected/tested by the Project Manager or it's Designer at any time. The fact that the materials were accepted on the basis of such certification shall not relieve the Contractor of his responsibility to use materials that conform to the specifications.
- E. The Contractor shall impose upon his suppliers the same quality control requirements, including inspection and test procedures, as imposed upon him by the specifications and referenced standards. The Contractor shall apply appropriate controls, designed to ensure that all materials supplied meet the requirements and specifications.

3.2 CONTRACTOR'S QUALITY CONTROL SYSTEM

- A. The Contractor is responsible for Quality Control of the Construction. All acquisition of materials, sequence of construction (except as otherwise indicated), and means and methods of construction shall be the responsibility of the Contractor. Establish system to perform sufficient inspection and tests of all items of work, including that of subcontractors, to ensure

conformance to Contract Documents for materials, workmanship, construction, finish, functional performance and identification.

1. Control System: Establish for all construction except where Contract Documents provide for specific compliance tests by testing laboratories and engineers employed by the City.
2. Control System: Specifically include all testing required by various sections of Specifications.
3. Quality Control System: Means by which Contractor assures himself that construction complies with requirements of Contract Documents.
 - a. Controls: Adequate to cover all construction operations and keyed to proposed construction schedule.

- B. The Contractor shall be responsible for assuring compliance with the quality standards as indicated in the Contract Documents. In addition, the Contractor shall be responsible for:
1. Review of submittals prior to their being forwarded to the Project Manager for review. The Contractor shall mark submittals with comments and shall indicate the date and party conducting the Contractor's review of each submittal.
 2. Final inspection of the project prior to calling for the Project Manager to conduct a final inspection. The Contractor shall provide his inspection comments to the Project Manager prior to the scheduled final inspection.
 3. Verification of completion of punch-list items prior to calling for verification inspection by the Project Manager.

- C. Records: Maintain correct records on appropriate forms for all inspections and tests performed, instructions received from the Project Manager and actions taken as result of those instructions.
1. Records: Include evidence that required inspections or tests have been performed (including type and number of inspections or tests, nature of defects, causes for rejection, etc.) proposed or directed remedial action, and corrective action taken.
 2. Document inspections and tests as required by each section of Specifications.

3.3 MATERIAL AND WORKMANSHIP

- A. Unless otherwise specified, or indicated on the Drawings, material shall be new, of best quality, and without flaws, and delivered upon completion in an undamaged condition.
- B. Workmanship shall be the best of its respective kind. Labor shall be performed in a thorough workmanlike manner by qualified, efficient, and skilled mechanics, acceptable to the Project Manager, and other trades involved on the job requiring acceptable substrate for the performance of their work.

3.4 TESTING – GENERAL

- A. Testing Laboratory and/or Engineering services are required for quality control in portions of the work identified in other sections of these specifications.
- B. Tests required by these Specifications shall be performed in strict accordance with referenced testing methods, procedures, and conditions. Pertinent data shall be included in clear, comprehensive written forms according to the requirements of these Contract Documents.

- C. Contractor: Provide equipment and facilities as required for testing at no additional cost, subject to Project Manager's review, for conducting field tests and for collecting and forwarding samples.
 - 1. Do not use materials or equipment represented by samples until tests, if required, have been made and materials or equipment found to be acceptable.
 - 2. Do not incorporate any product into work which becomes unfit for use after acceptance thereof.
- D. Testing: Materials or equipment proposed to be used may be tested at any time during their preparation or use. Furnish required samples without charge and give sufficient notice of placing of orders to permit testing. Products may be sampled either prior to shipment or after being received at site of work.
- E. Tests: Made by testing laboratory approved by the Project Manager. Except as otherwise provided, sampling and testing of materials and laboratory methods and testing equipment shall be in accordance with latest standards and tentative methods of ASTM.
 - 1. Specific information concerning testing methods, sample sizes, etc., is included under applicable sections of Specifications.
 - 2. Any modification of, or elaboration on, these test procedures included for specific materials under their respective sections in Specifications shall take precedence over these procedures.

3.5 OTHER TESTING

- A. Following Testing: Performed at expense of Contractor:
 - 1. Any additional tests required because of any tests that fail subject to following conditions:
 - a. Quantity and Nature of Tests: Determined by the Project Manager.
 - b. Tests: Taken in presence of the City and/or the Project Manager.
 - c. Proof of Noncompliance: Contractor liable for corrective action which the Project Manager feels is required including complete removal and replacement of defective material.
 - 2. Material Substitution: Any tests of material or equipment offered as substitute for specified item on which test may be required in order to prove its compliance with the Contract Documents.
- B. Contractor: May have tests performed on material and equipment for his own information and job control so long as the City does not assume responsibility for costs or for giving them consideration when appraising quality of materials.

3.6 EQUIPMENT TESTING

- A. Equipment testing shall be as determined appropriate by the Project Manager to assure proper performance according to the manufacturer's specifications for each equipment item.
- B. After all utility connections to equipment have been completed, the Contractor shall conduct final tests of equipment in presence of the City and Project Manager.
- C. Unless waived in writing by the Project Manager, the requirements of this section shall apply to all installed equipment items having utility connections.

3.7 NOTIFICATION

- A. The Contractor shall be responsible for notifying the Project Manager at least 3 working days prior to commencing work which is identified as requiring testing.
- B. The Contractor shall be responsible for scheduling and coordinating all required testing with the Project Manager and, when required by the City's Agents, the City's Independent Testing Agency.

3.8 TEST REPORTS

- A. Test reports, whether performed for the City or the Contractor, shall be submitted to the Project Manager and Contractor as soon as results are available. Reports shall be clear, concise, comprehensive written forms containing required test results.
- B. Reports of tests made by testing laboratories shall be distributed by testing laboratory as follows:
 - 1. Two (2) Copies – Project Manager.
 - 2. One (1) Copy – Contractor.
 - 3. One (1) Copy – Applicable Supplier or Subcontractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price. If the City is required to re-inspect work or conduct a special test because a previous inspection, requested by the Contractor, showed that the work was defective or not in conformance, the Manager or authorized representative may deduct from the contract value the cost of re-inspection at the rate of seventy-five dollars (\$75.00) per man-hour.

END OF SECTION 01 45 16

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing, installing, operating, maintaining, and removing temporary construction barriers, enclosures and field facilities including the Contractor's construction offices, staging areas, yards, storage areas, electrical power, telephone, water, fire protection, and sanitary service.
- B. Construction Office, Yards, and Storage Areas:
 - 1. Temporary facilities which the Contractor desires to locate in staging areas adjacent to the Work or within the project limits are subject to approval by the Project Manager.
 - 2. Contractor Field Office:
 - a. The Contractor shall provide a field office for this Project.
 - b. The Contractor shall acquire all necessary permits for installation and construction work related to the Contractor's field office and fencing.
 - c. The Contractor shall provide, as part of his on-site field office, a conference room for weekly meetings.
 - d. The Contractor shall furnish, install and maintain at least one computer with email in his main field office. This computer should be able to access all email and FTP as part of project submittal process. Provide wireless internet access, secured by password, for use by the Project Manager and Consultant during the work of the Contract.
 - e. Jack the mobile office unit off its wheels and provide support.
 - f. Install tie downs in compliance with code.
 - g. Provide access to the field office and easily accessible space for parking. Grade the field office site, access roadway and parking area for drainage, and surface with gravel paving or crushed stone.
 - h. Water and sewer lines to the field office, if installed, shall be installed per code.
- C. Electrical Service:
 - 1. Reference General Conditions Article 327 "Power, Lighting, Heating, Ventilating, Air Conditioning, and Water Services".
 - 2. Provide lighting and power for field offices, storage facilities and other construction facilities and areas.
 - 3. Provide power centers for electrically operated and controlled construction facilities including tools, equipment, testing equipment, interior construction lighting, heating, cooling and ventilation equipment.
 - 4. Provide night security lighting at secured areas within construction limits at offices, storage facilities, temporary facilities and excavated areas.
 - 5. Provide battery operated or equivalent emergency lighting facilities at construction areas where normal light failures would cause employees to be subjected to hazardous

conditions. Test such facilities monthly and maintain a record of these tests for the Project Manager's review.

6. Bear all costs of temporary electric and water service permits, fees and deposits required by the governing authorities, and connection charges and temporary easements including installation, maintenance and removal of equipment.

D. **Water Service:** The Contractor shall make all connections and extensions required and shall make use of water in direct support of the Work. The Contractor shall install an approved Water Department tap at the City's water source prior to obtaining any water. The Contractor shall arrange and pay for its supply/distribution system from the City's point of connection. The location and alignment of the Contractor's temporary supply/distribution system must be approved by the Project Manager prior to its installation. The Contractor shall leave in place all above ground and underground water distribution facilities unless otherwise directed by the Project Manager.

1. The Contractor shall not use in place fire hydrants or standpipes as sources for construction water or potable water.

E. **Fire Protection:** Furnish, install and maintain temporary portable fire protection equipment throughout the construction period at all buildings (including the project site), maintenance shops, and fuel storage on all large construction equipment and at the location of any flammable materials or construction materials.

F. **Sanitary Service:** Furnish, install and maintain temporary sanitary facilities and services throughout the construction period.

1. Ensure that separate or single user toilets shall be provided to ensure privacy between the sexes.
2. Provide general washing facilities adequate for the number of employees.
3. Provide special washing facilities adequate for the number of employees engaged in the application of paints, coating and other volatile or hazardous materials.

1.3 SUBMITTALS

A. Refer to Division 01 Sections "Submittals" and "Shop and Working Drawings, Product Data, and Samples" for submittal procedures.

B. Submit a shop drawing within five days of the Notice to Proceed that shows the following:

1. Temporary facilities equipment and materials (include manufacturer's literature).
2. Details and layout of temporary installations including fences, roads, utilities, parking, buildings, storage areas and drainage plans.
3. Lighting plan showing temporary lighting facilities, electrical service panel location, electrical circuit diagram and anticipated light level on the working roadway, pathway or construction surface.

PART 2 - PRODUCTS

2.1 ELECTRICAL SERVICE

A. Provide temporary power and lighting equipment consisting of fixtures, transformers, panel boards, groundings, lamps, switches, poles, conduits and wiring sized and capable of continuous

service and having adequate capacity to ensure a complete operating system. Comply with NEMA.

- B. Provide temporary extension cords to supply tools not longer than two hundred feet (200'), except that additional length may be used if equipment will be grounded within two hundred feet (200') of tool or power.
- C. Portable power generators shall be grounded.

2.2 DRINKING WATER SERVICE

- A. Provide sanitary materials and equipment that satisfies the requirements of codes and regulations pertaining to temporary water systems. Bottled products may be used if those products comply with codes. Clearly label portable containers having a dispensing tap and used only for drinking water. Provide single service disposable cups and a sanitary container for dispensing cups. A trash receptacle shall be provided and maintained beside each portable water supply.

2.3 FIRE PROTECTION

- A. Fire extinguishers shall be UL rated and shall comply with the current City fire code.

2.4 SANITARY SERVICE

- A. Provide materials and equipment adequate for the intended purposes, which will neither create unsanitary conditions nor violate the codes applicable to temporary sanitary facilities. Enclosures for toilet and washing facilities shall be weatherproof, sight proof, ventilated and sturdy.
- B. Provide portable type toilet facilities that satisfy the requirements of OSHA.
- C. Provide washing facilities as needed. Furnish soap, single-service paper towels, towel dispenser and towel receptacle. If paints, coatings and other volatile or hazardous materials injurious to humans will be applied as part of the contract, provide washing facilities with warm water of approximately one hundred twenty degrees (120°) F.

PART 3 - EXECUTION

3.1 ELECTRICAL SERVICE

- A. The approximate location of primary power lines is shown on the Construction Drawings. The Contractor shall locate electrical service where it will not interfere with equipment, storage spaces, traffic, and prosecution of the Work or the work of others. Installation shall present a neat and orderly appearance and shall be structurally sound. Maintain service in a manner that will ensure continuous electrical service and safe working conditions.

3.2 TELEPHONE SERVICE

- A. Install temporary telephone service in a neat and orderly manner and make structurally and electrically sound to ensure continuous service. Modify, relocate and extend as work progress

requires. Place conduit and cables where those products will not interfere with traffic, work areas, materials, handling equipment, storage areas and the work of other contractors. Service lines may be aerial.

3.3 INTERNET SERVICE

- A. Install temporary internet service and make structurally and electrically sound to ensure continuous service. Modify, relocate and extend as work progress requires. Place cables and equipment where those products will not interfere with traffic, work areas, materials, handling equipment, storage areas and the work of other contractors. Service lines may be aerial.
 - 1. Wireless Internet:
 - a. Provide wireless internet connection for the use by Project Manager and Consultants. Connection is to be Digital Subscriber Line (DSL) or faster to enable users to transmit images and/or drawings at an acceptable speed.
 - b. Wireless internet connection is to be secured by password. Password is to be made available to the Project Manager and Consultant for their use.

3.4 WATER SERVICE

- A. Install the systems in a neat and orderly manner. Make them structurally and mechanically sound. Provide continuous service. Modify, relocate and extend the systems as the work progresses.
- B. Locate systems where they will be convenient to work stations, sanitary facilities and first aid station but will not interfere with traffic, work areas, materials handling equipment, storage areas or the work of other contractors.
- C. Install vacuum breakers, backflow preventers and similar devices in a manner and location which will prevent temporary water from returning to the water mains.
- D. Do not incorporate any part of temporary water distribution system into the permanent water distribution system.

3.5 FIRE PROTECTION

- A. Install products in conformance with the requirements of the applicable Denver Fire Department and OSHA regulations.
 - 1. Provide functional fire extinguishers that are clearly identified for fire and an accessible supply of water during the period of construction. These fire extinguishers shall remain in place until permanent fire protection systems are functional.
 - 2. Furnish not less than one twenty (20) pound fire extinguisher, type 2A-20ABC within ten feet of cutting and welding operations.
 - 3. Provide twenty (20) pound fire extinguishers, type 2A-20ABC no further than one hundred feet (100') apart in buildings.
 - 4. Provide not less than one twenty (20) pound fire extinguisher, type 2A-20ABC on any equipment of seventy five (75) horsepower or more.
- B. Instruct construction personnel as to location and use of temporary fire protection equipment.
- C. Fire extinguishers shall be located for easy access. Their location shall be clearly marked so that they can be seen at least seventy five feet (75') away.

3.6 SANITARY SERVICE

- A. Place temporary sanitary (and washing) facilities within the limits of the work and convenient to the work stations. Make these facilities structurally and mechanically sound. Modify, relocate and extend the facilities as required by progress of the work.
- B. Service toilets at those time intervals which will minimize the accumulation of wastes and prevent creation of unsanitary conditions, but not less frequent than once per week.
- C. The waste from the sanitary and wash facilities shall be disposed of in accordance with all applicable rules, regulations and laws and with the least environmental impact.

3.7 FENCING

- A. Contact all utility service companies prior to planning fence location and post locations for certification of current utilities. Locate pothole posts planned within 5-feet of known utilities. Submit fencing plan and typical details to Project Manager at least seven days before planned execution for review and acceptance.

3.8 SIGNAGE

- A. Contractor shall not provide any signage for temporary facilities without prior approval from the Project Manager.

3.9 QUALITY CONTROL

- A. Provide products for, and the execution of, the Work of this Section that will satisfy the requirements of the NEC, OSHA, and local codes. Provide products that satisfy requirements of NEMA and are UL listed.

3.10 REMOVAL

- A. The Contractor shall locate all temporary facilities including the underground utilities so they can be completely removed without damaging permanent work or the worksite of other contractors.
- B. The Contractor shall remove all temporary facilities, including all underground utilities, and restore the site to the condition in which the City initially provided it to the Contractor or per the construction documents.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 50 00

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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 consists of requirements for the installation and maintenance of erosion and sedimentation prevention and protection measures during the construction of the project from just prior to the start of earth disturbance until final site stabilization. The cost of maintaining, repairing, and/or replacement of damaged BMP's will be at the Contractors expense.

Refer to "City and County of Denver Construction Activities Stormwater Manual" by City and County of Denver Wastewater Management Division, Department of Public Works, revised June 2010, or latest edition, at:

<https://www.denvergov.org/content/denvergov/en/wastewater-management/capital-projects-management/engineering-and-permits.html>

- B. Refer to applicable sections within the **Wastewater Capital Projects Management Standard Construction Specifications**, Wastewater Management Division, Department of Public Works, specifications updated September 2014, or latest edition.

PART 2 - PRODUCTS

- 2.1 Refer to "City and County of Denver Construction Activities Stormwater Manual".

PART 3 - EXECUTION

- 3.1 Refer to "City and County of Denver Construction Activities Stormwater Manual".

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Erosion and Sedimentation Control.

4.2 PAYMENT

Payment will be made at the **[lump sum contract]** price, and shall include required materials, transportation, equipment, labor, excavation, stockpiling, disposing, hauling off, watering, dust control, silt fence, curb line protection, concrete wash out containment, and vehicle tracking control as required in accordance with the Contract Drawings and Specifications. The contract price shall include all material, labor and equipment required to establish and maintain specified erosion and sedimentation controls prior to and during construction. The contract price shall include removal of erosion and sedimentation controls after final stabilization.

END OF SECTION 01 57 13

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 administrative and procedural requirements governing the Contractor's selection of products for use in the project.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "systems", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
 - 1. Products: Are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "Product" includes the terms "material", "equipment", "system" and terms of similar intent.
 - 2. Named Products: Are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature that is current as of the date of the Contract Documents.
 - 3. Materials: Are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 - 4. Equipment: Is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.4 SUBMITTALS

- A. Product List: A list of products is included in each appropriate specification division. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.
 - 1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.
 - 2. Form: Prepare product list with information on each item tabulated under the following column headings:
 - a. Related Specification Section number.
 - b. Generic name used in Contract Documents.
 - c. Proprietary name, model number, and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.

3. Initial Submittal: Within thirty (30) days after date of commencement of the Work, submit three (3) copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.
4. Completed List: Within sixty (60) days after date of commencement of the Work, submit three (3) copies of the completed product list. Provide a written explanation for omissions of data and for known variation from Contract requirements.
5. Action: The Project Manager will respond in writing to Contractor within two (2) weeks or receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Project Manager's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
 1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
 4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
 6. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

1.6 GENERAL PRODUCT REQUIREMENTS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. It is the responsibility of the Contractor and his installers, as experts, to notify the Project Manager of any specified product that to his knowledge will not meet the requirements or is unsuited to the application indicated or specified.
- C. The use of manufacturer's and trade names is intended only to establish standards of quality and performance and not to limit competition.
- D. Substitution of Materials and Equipment: All bids are to be based on those materials and equipment specified in the Contract Documents. Substitutions after the bid will be made in

accordance with the provisions of General Contract Conditions Article 406 “Substitution of Materials and Equipment”, and Division 01 Section “Substitutions”.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. The Contract Documents and governing regulations govern product selection. Procedure governing product selection include the following:
1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
 2. Semi-proprietary Specification Requirements:
 - a. Where Specifications name two or more products or manufacturers, provide one (1) of the products indicated. No substitutions will be permitted.
 - b. Where Specifications specify products or manufacturers by name, accompanied by the term “or equal” or “or approved equal,” comply with the Contract Document provisions concerning “substitutions” to obtain approval for use of an unnamed product.
 3. Non-proprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning “substitutions” to obtain approval for use of an unnamed product.
 4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
 5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. Manufacturer’s recommendations may be contained in published product literature or by the manufacturer’s certification of performance.
 6. Compliance with Standards, Codes and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.
 7. Visual Matching:
 - a. Where Specifications require matching an established Sample, the Project Manager’s decision will be final on whether a proposed product matches satisfactorily.
 - b. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents concerning “substitutions” for selection of a matching product in another product category.
 8. Visual Selection: Where specified product requirements include the phrase “...as selected from manufacturer’s standard colors, patterns, textures...” or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Project Manager will select the color, pattern, and texture from the product line selected.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

3.2 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. To the fullest extent possible, provide products of the same kind from a single source.
 - 2. Substitutions to the specified products will only be allowed in accordance with General Contract Conditions Article 406 "Substitution of Materials and Equipment", and Division 01 Section "Substitutions".
- B. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on surfaces of products that will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. The cost of the Work described in this Section shall be included in the Contract price.

END OF SECTION 01 60 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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. The Work specified in this Section consists of providing storage and protection of the materials, products and supplies which are to be incorporated into the construction and indicating such storage areas on the Contract Drawings with the location and dates when such areas will be available for each purpose.
- B. Reference General Contract Conditions Article 803 "Protection of Property and Work in Progress".

1.3 SUBMITTALS

- A. Refer to Division 01 Sections "Submittals" and "Shop and Working Drawings, Product Data, and Samples" for submittal procedures. Submit concurrently with submittals required in Division 01 Section "Layout of Work and Surveys".
- B. Storage Site Plan: Submit working drawings showing locations of storage areas not indicated on the Contract Drawings.
- C. Storage and Protection Methods: Submit descriptions of proposed methods and locations for storing and protecting products.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Materials required for the storage and protection of the items specified shall be durable, weatherproof and either factory finished or painted to present an appearance acceptable to the Project Manager. Storage facilities shall be uniform in appearance with similar materials used to the maximum extent possible.

PART 3 - EXECUTION**3.1 GENERAL REQUIREMENTS OF EXECUTION**

- A. Palletize materials, products and supplies which are to be incorporated into the construction and stored off the ground. Store these items in a manner which will prevent damage and which will facilitate inspection. Leave seals, tags and labels intact and legible. Maintain access to products to allow inspection. Protect products that would be affected by adverse environmental conditions.

- B. Periodically inspect stored products to ensure that products are being stored as stipulated and that they are free from damage and deterioration.
- C. Do not remove items from storage until they are to be incorporated into the Work.
- D. The Contractor shall ensure that all protective wrappings and coverings are secure and ballasted to prevent any items from deterioration and/or subsequent dislodgment. All items on the worksite that are subject to becoming windborne shall be ballasted or anchored.

3.2 HANDLING AND TRANSPORTATION

- A. Handling:
 - 1. Avoid bending, scraping or overstressing products. Protect projecting parts by blocking with wood, by providing bracing or by other approved methods.
 - 2. Protect products from soiling and moisture by wrapping or by other approved means.
 - 3. Package small parts in containers such as boxes, crates, or barrels to avoid dispersal and loss. Firmly secure an itemized list and description of contents to each container.
 - 4. Refer to Division 32 Sections related to landscape materials for proper handling and storage of plant material.
- B. Transportation: Conduct the loading, transporting, unloading, and storage of products so that they are kept clean and free from damage.
 - 1. Refer to Division 32 Sections related to landscape materials for proper transportation of plant material.

3.3 STORAGE

- A. Store items in a manner that shall prevent damage to the City's property. Do not store hydraulic fluids, gasoline, liquid petroleum, gases, explosives, diesel fuel, and other flammables in excavations, except one day's supply of diesel fuel may be stored in open excavations.
- B. Provide sheltered weather-tight or heated weather-tight storage as required for products subject to weather damage.
- C. Provide blocking, platforms or skids for products subject to damage by contact with the ground.
- D. All material shall be stored according to the manufacturer's recommendations. Any material that has to be stored within specified temperature or humidity ranges shall have a twenty four (24) hour continuously written recording made of the applicable condition. Should the recording show that the material was not stored within the recommended ranges the material shall be considered defective and in nonconformance. If a certification from the manufacturer's engineering design representative is provided stating that the actual variations are acceptable and will in no way harm the material or affect warranties, then the deficiency will be considered corrected.
- E. Store hazardous material separately, with all material marked with a label showing the hazard and how to treat exposure to the material.

3.4 LABELS

- A. Storage cabinets and sheds that will contain flammable substances and explosive substances shall be labeled **FLAMMABLE--KEEP FIRE AWAY** and **NO SMOKING** with conspicuous lettering and conforming to OSHA requirements.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. The cost of the Work described in this Section shall be included in the Contract price. See Division 01 Section "Schedule of Values" for additional requirements for the possible payment of stored material.

END OF SECTION 01 66 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 procedures and accuracy requirements for survey services for layout of work and field measurement of work quantities to be determined by surveys.
 - 1. The Work is to be verified and coordinated with Contract Drawings. Variations between Contract Drawings and actual field conditions are to be immediately brought to the attention of the Project Manager.
 - 2. Reference Construction General Contract Conditions Article 318 "Construction Surveys" and Article 319 "Preservation of Permanent Land Survey Control Markers".

1.3 SUBMITTALS

- A. Refer to Division 01 Sections "Submittals" and "Shop and Working Drawings, Product Data, and Samples" for the submittal process.
- B. Field Notes: Submit Copies of original pages of field notes.
- C. Closeout Submittals:
 - 1. Original field notebooks when filled and at end of contract.
 - 2. Measurements for Record Documents.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 CONSTRUCTION LINES AND GRADES**

- A. The Contractor shall make surveys and layouts as necessary to delineate the work. The Contractor shall make the surveys for the proper performance of the Work. As a part of such surveys, the Contractor shall furnish, establish, and maintain in good order survey control points that may be required for the completion of the Work subject to the approval of the Project Manager as to their location, sufficiency, and adequacy. However, such approval by the Project Manager shall not relieve the Contractor of his responsibility for the accuracy of his survey work.
- B. The Contractor shall furnish skilled labor, instrument platforms, ladders, and such other temporary structures as may be necessary for making and maintaining points and lines in connection with the surveys required.

- C. The City may draw the Contractor's attention to errors or omissions in lines or grades, but the failure to point out such errors or omissions shall not give the Contractor any right or claim nor shall in any way relieve the Contractor of his obligations according to the terms of this contract.
- D. The Contractor's instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards and in proper condition and adjustment at all times. Surveys shall be performed under the direct supervision of a Colorado licensed surveyor.

3.2 DIGITAL FILES

- A. If approved by the Project Manager, Contractor may elect to utilize design consultant's digital CADD files as guidance for layout and location of site elements.
- B. Layout and location of site elements, grades and features from digital CADD files does not relieve the Contractor of requirements, locations and grades shown on the Contract Drawings.
- C. Contractor is responsible to verify locations of elements staked with digital data to assure conformance with the Contract Drawings at a level of accuracy as stated in Section 3.3 below.

3.3 SURVEYING ACCURACY AND TOLERANCES IN SETTING SURVEY, LAYOUT, AND QUANTITY CALCULATION STAKES

- A. The tolerances generally applicable in setting survey stakes shall be as set forth in the CDOT Survey Manual, latest edition. Such tolerances shall not supersede stricter tolerances required by the drawings or specifications, and shall not otherwise relieve the Contractor of responsibility for measurements in compliance therewith.

3.4 RECORD MEASUREMENTS

- A. Provide record measurement for items that will be hidden or visible including all civil, mechanical and electrical, control work, and all utilities that are placed in concrete, earth, or behind walls shall be made.
- B. Items located within or five feet beyond a building shall be referenced to building column lines and finish floor elevations.
- C. Special attention shall be paid to items requiring service, sensors, items with moving parts, access points and locations of junctions, elevation changes, and directional changes.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 71 23

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for maintaining a clean, orderly, hazard free worksite during construction, and final cleaning for the City's Final Acceptance. Failure to maintain the worksite will be grounds for withholding monthly payments until corrected to the satisfaction of the Project Manager.
- B. Reference General Contract Conditions as listed:
 - 1. Article 325 "Cleanup During Construction".
 - 2. Article 803 "Protection of Property and Work in Progress".
 - 3. Article 2001 "Cleanup Upon Completion".

1.3 JOB CONDITIONS

- A. Safety Requirements: Maintain the worksite in a neat, orderly and hazard-free manner in conformance with all federal, state and local rules, codes, regulations and orders, including all OSHA requirements, until Final Acceptance of the Work. Keep catwalks, underground structures, worksite walks, sidewalks, roadways and streets, along with public and private walkways adjacent to the worksite, free from hazards caused by construction activities.
 - 1. Inspect those facilities regularly for hazardous conditions caused by construction activities.
- B. Hazards Control:
 - 1. Store volatile wastes in covered metal containers and remove those wastes from worksite daily.
 - 2. Do not accumulate wastes which create hazardous conditions.
 - 3. If volatile and noxious substances are being used in spaces that are not naturally ventilated, provide artificial ventilation.
 - 4. Hazard controls shall conform to the applicable federal, state, and local rules and regulations.
 - 5. Provide appropriate waste receptacles in all areas in which employees are working. Waste receptacles shall be kept covered at all times. All materials on site shall be anchored and covered to prevent any objects from becoming wind-borne.
- C. Access: Maintain the worksite to permit access by other City contractors as required and to allow access by emergency personnel.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

- A. Utilize the type of cleaning materials recommended by the manufacturer for the surfaces to be cleaned.
- B. Maintain current Safety Data Sheets (SDS) on site for all chemicals. Refer to following link for associated OSHA requirements.
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10103
- C. Ensure proper disposal of all wastes generated from the use of these materials. Must ensure compliance with all environmental regulations.

PART 3 - EXECUTION

3.1 INTERIM CLEANING

- A. Clean the worksite every shift/workday for the duration of the construction contract. Maintain structures, grounds, storage areas, and other areas of worksite, including public and private properties immediately adjacent to worksite, free from accumulations of waste materials caused by construction operations. Place waste materials in covered metal containers. All hard concrete, steel, wood, and finished walking surfaces shall be swept clean daily.
- B. Remove or secure loose material on open decks and on other exposed surfaces at the end of each workday or more often in a manner that will maintain the worksite hazard free. Secure material in a manner that will prevent dislodgment by wind and other forces.
- C. Sprinkle waste materials with water or acceptable chemical palliative to prevent blowing of dust.
- D. Promptly empty waste containers when they become full and legally dispose of the contents at dumping areas off the City's property.
- E. Control the handling of waste materials. Do not permit materials to be dropped or thrown from structures.
- F. Immediately remove spillage of construction related materials from haul routes, work site, private property, or public rights of way.
- G. Clean only when dust and other contaminants will not precipitate upon newly painted surfaces.
- H. Cleaning shall be done in accordance with manufacturer's recommendation.
- I. Cleaning shall be done in a manner and using such materials as to not damage the Work.
- J. Clean areas prior to painting or applying adhesive.

- K. Clean all heating and cooling systems prior to operations. If the Contractor was allowed to use the heating and cooling system it shall be cleaned prior to testing.
- L. Clean all areas that will be concealed prior to concealment.

3.2 FINAL CLEANING

- A. Inspect interior and exterior surfaces, including concealed spaces, in preparation for completion and acceptance.
- B. Remove dirt, dust, litter, corrosion, solvents, paint, stains, and extraneous markings.
- C. Remove surplus materials, except those materials intended for maintenance.
- D. Remove all tools, appliances, equipment, and temporary facilities used in the construction.
- E. Remove detachable labels and tags. File them with the manufacturer's specifications for that specific material for the City's records.
- F. Repair damaged materials to the specified finish or remove and replace.
- G. Clean all catch basins, manholes, drains, strainers, and filters after all trades have completed their work and just before Final Acceptance
- H. Sweep roadway, driveways, floors, steps, and walks.
- I. Interior areas of buildings shall be vacuumed clean and mopped.
- J. Final cleanup applies to all areas within and adjacent to the site.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 74 23

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 procedures required for Substantial Completion under Title 19 and Final Completion and Acceptance of the Work under Title 20 of the General Contract Conditions and Division 01 Section "Contract Record Documents".
- B. Reference General Contract Conditions as listed:
 - 1. Article 906 "Applications for Payment".
 - 2. Article 909 "Additional Withholding of Progress Payments".
 - 3. Article 2003 "Final Settlement".

1.3 PREPARATION FOR FINAL INSPECTION

- A. Before requesting inspection for Final Acceptance of the Work by the City, inspect, clean, and repair the Work as required.

1.4 FINAL INSPECTION

- A. When the Contractor considers that the Work is complete, he shall submit written certification that:
 - 1. All punch list items have been completed.
 - 2. All clean up at the project site has been accomplished.
 - 3. Work has been inspected by the Contractor for compliance with contract documents.
 - 4. Work has been completed in accordance with contract documents.
 - 5. Work is ready for final inspection by the City.
 - 6. All required Record Documents have been submitted and accepted.
 - 7. All damaged or destroyed real, personal, public or private property has been repaired or replaced.
 - 8. All operation and maintenance manuals have been submitted and accepted and all training has been completed.
- B. The Project Manager will inspect to verify the status of completion with reasonable promptness after receipt of such certifications. The inspection of the work will be done in accordance with the General Conditions.
- C. If the Project Manager finds incomplete or defective work:
 - 1. The Project Manager may, at his sole discretion, either terminate the inspection or prepare a punch list and notify the Contractor in writing, listing incomplete or defective work.
 - 2. The Contractor shall take immediate steps to remedy stated deficiencies and send a second written certification to the Project Manager that Work is complete.

3. The Project Manager will then re-inspect the Work.

1.5 REINSPECTION FEES

- A. Should the Project Manager perform re-inspection due to failure of the Work to comply with the claims of status of completion made by the Contractor:
 1. The Contractor shall compensate the City for such additional services at the rate of seventy-five dollars (\$75.00) per man-hour.
 2. The City shall deduct the amount of such compensation from the final payment to the Contractor.

1.6 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a Final Statement of Accounting to the Project Manager.
- B. The Final Statement of Accounting shall reflect all adjustments to the contract amount and shall include the following:
 1. The original contract amount.
 2. Additions and deductions resulting from:
 - a. Previous change orders.
 - b. Allowances.
 - c. Final quantities for unit price items. Along with this statement shall be detailed backup for the quantities.
 - d. Deductions or corrected work.
 - e. Penalties.
 - f. Deductions for liquidated damages.
 - g. Deductions for re-inspection payments.
 - h. City resurveys required due to the Contractor.
 - i. Other adjustments.
 3. Total contract amount, as adjusted.
 4. Previous payments.
 5. Sum remaining due.
- C. If required, the Project Manager will prepare a final change order, reflecting approved adjustments to the Contract sum which were not previously made by change orders.

1.7 FINAL APPLICATION FOR PAYMENT

- A. The Contractor shall submit the final application for payment in accordance with the procedures and requirements stated in the General Conditions Title 20 "Final Completion and Acceptance of the Work".

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 77 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 consists of requirements for preparing and submitting operation and maintenance data for mechanical, electrical, and other specified equipment.

1.3 SUBMITTALS

- A. Refer to Division 01 Sections “Submittals” and “Shop and Working Drawings, Product Data, and Samples” for submittal procedures.
- B. Submit one (1) digital copy and two (2) bound hard copy of the proposed Operation and Maintenance Data Manual format including a table of contents not less than ninety (90) days prior to acceptance tests and final inspection.
- C. Submit one (1) digital copy and two (2) bound hard copy of Operation and Maintenance Data Manual within ten days after system startup is complete. These copies shall incorporate any comments made on the previous submittals, along with final readings on all settings and gauges taken while the system is in fully satisfactory operation.

1.4 CONTINUOUS UPDATING PROGRAM

- A. Furnish one digital copy of the Contractor’s letter indicating that suppliers have been notified to provide updated operation and maintenance data, service bulletins, and other information pertinent to the equipment, as it becomes available.

PART 2 - PRODUCTS

- A. The following are the requirements of hard copies:
 - 1. Paper Size: 8-1/2-inches x 11-inches.
 - 2. Paper: White bond, at least twenty (20) pound weight.
 - 3. Text: Typewritten.
 - 4. Printed Data: Manufacturer’s catalog cuts, brochures, operation and maintenance data. Clear reproductions thereof will be acceptable. If this data is in color, all final manuals must contain color data.
 - 5. Drawings: 8-1/2-inches x 11-inches, bound with the text. Larger drawings are acceptable provided they are folded to fit into a pocket inside the rear cover of the manual. Reinforce edges of large drawings.
 - 6. Prints of Drawings: Black ink on white paper, sharp in detail, and suitable for making reproductions.

7. Flysheets: Separate each portion of the manual with colored, neatly prepared flysheets briefly describing the contents of the ensuing portion.
8. Covers: Provide forty (40) to fifty (50)-mil, clear plastic, front and plain back covers for each manual. The front covers shall contain the information required in Article 3.2 below.
9. Bindings: Conceal the binding mechanism inside the manual; lockable 3 ring binders shall be provided.

PART 3 - EXECUTION

3.1 GENERAL

- A. Assemble each operation and maintenance manual using the manufacturer's latest standard commercial data.

3.2 COVER

- A. Include the following information on the front cover and on the inside cover sheet:
 1. Title: "Operation and Maintenance Instructions".
 2. Title of structure or facility.
 3. Title and number of contract.
 4. Contractor's name and address.
 5. General subject of the manual.
 6. Leave spaces for signatures of the City representatives and acceptance date.

3.3 CONTENTS OF THE MANUAL

- A. An index of all volumes in each volume of multiple volume systems.
- B. An index in front of each volume. List and combine the literature for each system in the sequence of operation.
- C. Names, addresses, and telephone numbers of Contractor, suppliers, and installers along with the manufacturer's order number and description of the order.
- D. Name, address, and telephone numbers of manufacturer's nearest service representatives.
- E. Name, address, and telephone number of nearest parts vendor and service agency.
- F. Copy of guaranties and warranties issued to, and executed in the name of, the City.
- G. Anticipated date City assumes responsibility for maintenance.
- H. Description of system and component parts including theory of operation.
- I. Pre-operation check or inspection list.
- J. Procedures for starting, operating and stopping equipment.
- K. Post operation check or shutdown list.

- L. Inspection and adjustment procedures.
- M. Troubleshooting and fault isolation procedures for on-site level of repair.
- N. Emergency operating instructions.
- O. Accepted test data.
- P. Maintenance schedules and procedures.
- Q. Test procedures to verify the adequacy of repairs.
- R. One copy of each wiring diagram.
- S. One (1) copy of each piping diagram.
- T. Location where all measurements are to be made.
- U. One (1) copy of each duct diagram.
- V. One (1) copy of control diagram.
- W. One (1) copy of each accepted shop drawing.
- X. One (1) copy of software programs imputable or changeable on site.
- Y. Manufacturer's parts list with catalog names, numbers and illustrations.
- Z. A list of components which are replaceable by the City.
- AA. An exploded view of each piece of the equipment with part designations.
- BB. List of manufacturer's recommended spare parts, current prices and recommended quantities for two (2) years of operation.
- CC. List of special tools and test equipment required for the operation, maintenance, adjustment, testing and repair of the equipment, instruments and components.
- DD. Scale and corrosion control procedures.
- EE. Disassembly and re-assembly instructions.
- FF. Troubleshooting and repair instructions.
- GG. Calibration procedures.
- HH. Ordering information.
- II. Training course material used to train City staff, including slides and other presentation material.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 78 23

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for preparing and submitting warranties and bonds required by these specifications.
- A. Reference the General Contract Conditions as listed:
 1. Article 111 "Final Completion".
 2. Article 1501 "Surety Bonds".
 3. Article 1502 "Performance Bond".
 4. Article 1503 "Payment Bond".
 5. Article 1801 "Contractor's Warranties, Guarantees, and Correction of Work".
 6. Article 1802 "Performance During Warranty Period".

1.3 SUBMITTALS

- A. Refer to Division 01 Section "Submittals" for submittal procedures.
- B. Submit executed warranties and bonds.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 WARRANTIES AND BONDS**

- A. Execute the warranties and bonds required by the Contract Documents. Prepare and submit a list of all warranties and bonds on the form provided by the City. Reference Division 01 Section "Standard Forms".
- B. Provide warranties or bonds for the materials, labor, and time period set forth in the sections of these specifications requiring such documents. All warranties shall be in accordance with the General Contract Conditions. Refer to the individual specifications sections for all specific items requiring longer warranty periods.
- C. Provide all warranties and bonds that the manufacturer or supplier furnishes at no additional cost in regular commercial trade. All warranties shall be in accordance with the General Contract Conditions. Refer to the individual specifications sections for all specific items requiring longer warranty periods.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 78 35

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for maintaining, marking, recording, and submitting contract record documents, including shop drawings, warranties, contract documents, and Contractor records.
- B. Reference General Contract Conditions Article 324 “Documents and Samples at the Site” and Division 32 Sections “Irrigation Systems” and “Automatic Irrigation Controllers”.

1.3 SUBMITTALS

- A. Each submittal of record documents shall contain the following information:
 - 1. Date.
 - 2. Project title and numbers.
 - 3. Contractor’s name and address.
 - 4. Title and number of each record document.
 - 5. Certification that each document as submitted is complete and accurate.
 - 6. Signature of the Contractor or his authorized representative.
- B. At the completion of this contract, deliver all record documents including the following:
 - 1. Shop drawings, diagrams, illustrations, schedules, charts, brochures and other similar data, updated to record status.
 - 2. Warranties, guarantees, and bonds.
 - 3. Contract documents.
 - 4. Contractor records.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 MAINTENANCE OF DOCUMENTS**

- A. The Contractor shall maintain at the worksite on a current basis one record copy of all drawings, specifications, addenda, change orders, approved shop drawings, working drawings, product data, and samples in good order and marked currently to record all changes made during construction.
- B. Maintain at the field office one copy of the following record documents:
 - 1. Contract Documents:

- a. Contract drawings with all clarifications, requests for information, directives, changes and field-modified conditions clearly posted.
 - b. Contract specifications with all clarifications, requests for information, changes, directives and record of manufacturer actually used along with product trade name.
 - c. Reference Standards in accordance with Division 01 Section "Definitions and Conventions".
 - d. One set of drawings to record the following:
 - 1) Horizontal and vertical location of underground utilities affected by the Work.
 - 2) Location of internal utilities; include valves, controls, conduit, duct work, switches, pressure reducers, size reducers, transitions, crosses, tees, filters, motors, heaters, dampers, regulators, safety devices, sensors, access doors, and appurtenances that are concealed in the construction shall be shown with dimensions given from a visible and recognizable reference to the item being located in all three dimensions. The drawing shall also reference the applicable submittal for the item being located.
 - 3) Field changes of dimensions and details including as-installed elevations and location (station and offset).
 - 4) Details not on original contract drawings but obtained through requests for information or by other communications with the City.
2. Contractor Records:
- a. Daily QC Reports.
 - b. Certificates of compliance for materials used in construction.
 - c. Nonconformance Reports (NCRs).
 - d. Remedial Action Requests (RARs).
 - e. Completed inspection list.
 - f. Inspection and test reports.
 - g. Test procedures.
 - h. Qualification of personnel.
 - i. Approved submittals.
 - j. Material and equipment storage records.
 - k. Safety Plan.
 - l. Erosion, sediment, hazardous and quality plans.
 - m. Hazardous material records.
 - n. First report of injuries.

3.2 RECORDING

- A. Keep record documents current daily.
- B. Legibly mark copies of the contract drawings to record actual construction.
- C. Legibly mark up each Section of the technical specifications and contract drawings to record:
 - 1. Changes made by change orders, requests for information, substitutions, and variations approved by submittals.

3.3 DOCUMENT MAINTENANCE

- A. Maintain Documents in a clean, dry and legible condition, which shall be turned over to the City prior to final acceptance.

- B. Do not use record documents for construction purposes.
- C. Make documents available for inspection by the Project Manager and any others having jurisdiction.

3.4 REVIEW

- A. Project Manager or their designated representative will inspect the Record Drawings at each weekly progress meeting to ensure that they are being maintained and contain the most current data.
- B. Prior to any application for payment, the Project Manager or his designated representative will inspect the record documents to ensure that they are being maintained and contain the most current correct data with particular attention to Record Drawings.
- C. If, during the inspection, the Project Manager determines that the documents are not being maintained and kept current as to as-installed conditions, an amount may be withheld from the payment request and deducted from the contract value to cover the City's cost of collecting and recording the Record Contract data. This cost will be determined on the basis of seventy-five dollars (\$75.00) per man-hour of effort.

3.5 QUALITY CONTROL

- A. Record documents shall be prepared by Contractor to a high standard of quality, such as that set forth in MIL STD 100, American National Standard Drafting Manual (ANSI Y14), or other relevant lower tier specification defining equal drafting quality for microfilming, except for daily reports.

3.6 IRRIGATION RECORD DRAWINGS

- A. Refer to Division 32 Section "Irrigation Systems", Article 1.5.G

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 78 39

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 forms to be used by the Contractor throughout the duration of the work.
 - 1. This is not a complete listing of all required forms.
 - 2. Required Forms
 - a.
 - 3. The Contractor may create their own forms listed under Sample Forms recreate some of the forms so that they are compatible with the Contractor's Project Management system. However, Contractor must receive prior approval from the Project Manager before using modified forms.
 - 4. The Contractor shall properly complete all forms required by the contract or the Project Manager.
 - 5. The Project Manager shall review and approve all submitted forms. If submitted forms are not acceptable the Contractor shall resubmit forms in an acceptable format.

1.3 REQUIRED FORMS

- A. The Contractor shall use the following required forms provided by the City
 - 1. Submittal Log.
 - 2. Request for Substitution.
 - 3. Quality Control Report.
 - 4. Request for Information Log.
 - 5. Non-Conformance Report.
 - 6. Corrective Action Report.
 - 7. Pay Application Forms.

1.4 SAMPLE FORMS

- A. The Contractor may create their own forms to be similar in style and content of the examples listed below.
 - 1. Schedule.
 - 2. Contractor/Subcontractor Warranty (reference the General Contract Conditions).
 - 3. Request for Substantial Completion Letter.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 COMPLETING FORMS

- A. All documents are to be filled in digitally by the Contractor using the format provided by the Project Manager or using Adobe Acrobat 8 or newer. It is at the discretion of the Project Manager if other forms or formats will be accepted.

3.2 SIGNING FORMS

- A. Original hand written signatures are acceptable for all documents. The Contractor is to fill out the document digitally as indicated above prior to signing the hard copy.
 - 1. If the form is to be submitted digitally to the Project Manager the document shall be scanned and saved as an Adobe Acrobat file.
- B. Digital signatures are acceptable for all documents. The Contractor is to fill out the document digitally in the format provided by the Project Manager or Adobe Acrobat 8 or newer. The file must be signed and submitted digitally to the Project Manager.
 - 1. All digital signatures must contain the name of signer in plain text and the time and date the signature is executed.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

4.2 PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the Contract price.

END OF SECTION 01 99 90

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for demolition and removal of:
 - 1. Remove, salvage, store and reinstall perimeter cap and step stones.
 - 2. Remove, salvage, store and reinstall terrazzo panorama marker sets.
 - 3. Remove, salvage, store and reinstall memorial benches.
 - 4. Remove, salvage, store and reinstall existing signage.
 - 5. Remove salvage and deliver trash receptacles.
 - 6. Remove, salvage and deliver drinking fountain.
 - 7. Remove salvage, store and reinstall drinking fountain memorial stone ring sets.
 - 8. Remove and dispose of utility vault including electrical and sanitary service termination.
 - 9. Saw cut, remove and dispose of asphalt pavement.
 - 10. Remove and dispose of asphalt walks.
 - 11. Remove and dispose of concrete pavement.
 - 12. Remove and dispose of sand stone paver sets including grout and concrete setting bed.
 - 13. Remove and dispose of concrete grade beams.
 - 14. Remove and dispose of masonry walls including concrete stem and footer.
 - 15. Remove and dispose of sand stone curb sets.
 - 16. Remove, protect and deliver interpretive stone panels.
 - 17. Remove, protect and deliver sand stone sun dial.
 - 18. Removal and disposal of terrazzo panorama including divider strips and under bed.
- B. Related Sections:
 - 1. Division 01 Section "Temporary Facilities and Controls".
 - 2. Division 01 Section "Erosion and Sedimentation Control".
 - 3. Division 01 Section "Tree Protection and Retention".
 - 4. Division 31 Section "Earth Moving".

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: Carefully detach from existing construction, in a manner to prevent damage, and deliver to the City in a condition ready for re-use.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- E. Recyclable Material: Material generated during demolition operations that can be reconditioned and reclaimed for the same or different use. Such materials include asphalt, concrete, metals (steel, iron, aluminum, copper, etc), rubber, glass and paper.

1.4 PROJECT CONDITIONS

- A. Keep dust to a minimum at removal areas. Use water trucks as necessary.
- B. Ensure safety of persons in demolition area. Provide temporary barricades as required per Division 01 Section “Temporary Facilities and Controls”.

1.5 PRE-CONSTRUCTION MEETINGS

- A. Preconstruction: Inspect and discuss condition of construction to be selectively demolished.
- B. Review structural load limitations of existing structure.
- C. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
- D. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
- E. Review areas where existing construction is to remain and requires protection.
- F. Agenda Items

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property [**, for environmental protection**] [**, for dust control**] [**and**] [**, for noise control**]. Indicate proposed locations and construction of barriers.
- B. Schedule of Demolition Activities: Indicate the following:
 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure the City’s 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.
- C. Inventory: Submit a list of items to be removed and salvaged and deliver to the City prior to start of demolition.
- D. Preconstruction Photographs or Video: Submit digital photographs or videos prior to Work commencing.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory:
 - 1. Submit a list of items that have been removed and salvaged.
 - 2. Include documentation of the type and volume/weight of materials hauled to the nearest recycling center.
- B. Landfill Records: Provide records of receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Soils as indicated on documents, free of debris, frozen materials, roots, and other organic matter. See Division 01 Section "Earth Moving".

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, pavement, trails, utilities, and vegetation to remain.
- B. Set up all barriers, including those for tree protection, in accordance with Division 01 Section "Temporary Facilities and Controls" and Division 01 Section "Tree Protection and Retention", prior to proceeding with any demolition.
- C. Protection and Repair of Underground lines:
 - 1. Existing Public Utilities: Locate existing underground utilities within the limits of work per General Contract Conditions, Article 804 Protection of Municipal, Public Service or Public Utility Systems. Request utility locates seventy two (72) hours in advance of any excavations by calling the Utility Notification Center of Colorado at 811. The Contractor is responsible for providing written and graphical documentation from the utility owner. Take whatever precautions are necessary including potholing to verify location and depth to protect these underground lines from damage. Should unmarked or incorrectly marked utilities or other piping be encountered during excavation, notify the Project Manager immediately for direction. If damage does occur, all damage shall be repaired by the utility owner and all costs of such repair shall be paid by the Contractor. Only written all clears will be acceptable from utility providers or utility locate services, verbal all clears will not be accepted.
 - 2. Existing Private Utilities: Locate existing underground utilities within the limits of work per General Contract Conditions, Article 804 Protection of Municipal, Public Service or Public Utility Systems. The Contractor is required to contact all private utility companies including Denver City departments to locate all private utilities. The Contractor is responsible for providing written and graphical documentation from the private utility owner. The request for locates shall be a minimum of seventy two (72) prior to proceeding with any excavation. If, after such requests, private utilities are encountered and damaged by the Contractor these shall be repaired at no cost to the city. If the Contractor damages staked or located private utilities they shall be repaired by the utility

owner and all costs of such repair shall be paid by the Contractor. Only written all clears will be acceptable from utility providers or utility locate services, verbal all clears will not be accepted.

3.2 DEMOLITION

- A. Pavement, Slabs, and Miscellaneous Concrete Items:
1. Remove concrete slabs-on-grade, curbs, and miscellaneous concrete items as directed. Where concrete to be removed abuts concrete to remain, pavement shall be uniformly saw-cut along an existing joint. Jagged or crooked edges will not be acceptable. Concrete shall be broken up, hauled and disposed off site. All recyclable materials shall be hauled to nearest recycling center and any non-recyclable materials shall be hauled to Denver Arapahoe Disposal Site (DADS). DADS Disposal tickets shall be provided to the Contractor by Project Manager.
 2. Remove asphalt paved roads, parking lots, walks, curbs and miscellaneous asphalt as indicated on Contract Drawings. Cuts between pavement to be removed and pavement to remain shall be saw-cut to full depth, straight, smooth and clean with no jagged edges. Asphalt shall be broken up, hauled and disposed off site. All recyclable materials shall be hauled to nearest recycling center and any non-recyclable materials shall be hauled to DADS. DADS Disposal tickets shall be provided to the Contractor by Project Manager.
 3. Remove concrete pipe sections and miscellaneous concrete items as directed.
 4. Remove road base material that is exposed after removing the pavement. This material shall be hauled and disposed off site unless otherwise directed by the Project Manager. All recyclable materials shall be hauled to nearest recycling center and any non-recyclable materials shall be hauled to DADS. DADS Disposal tickets shall be provided to the Contractor by the Project Manager.
- B. Abandoned Utilities: Remove aboveground utilities and terminate as approved by the utility company and the Project Manager. Remove necessary portions of underground utilities to a minimum of twenty-four (24)-inches below the elevation of excavation or final grade. Cap off conduits with minimum twenty-four (24)-inch long concrete plugs.

3.3 RESTORATION

- A. Backfilling: Ensure that areas to be filled are free of standing water, frost, frozen material, vegetation, including roots and debris. Place fill materials in accordance with Division 31 Section "Earth Moving".
- B. Grading:
1. Restored Areas: Grade surface to blend with original contours and provide free drainage flow. All ruts and depressions where any amount of standing water collects shall be re-graded to a smooth natural appearance to ensure positive drainage.
 2. New Construction Areas: Grade as indicated in Division 31 Section "Earth Moving".

3.4 DISPOSAL

- A. Remove trash, debris and waste materials, haul and legally dispose of it off the property. All recyclable materials shall be hauled to nearest recycling center and any non-recyclable materials shall be hauled to DADS. DADS Disposal tickets shall be provided to the Contractor by the Project Manager.

- B. Salvaged Material: All salvaged material remains the property of the City. Store or deliver as directed by the Project Manager.

3.5 QUALITY CONTROL

- A. Comply with safety requirements for demolition, ANSI A10.6-83.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Demolition.
- B. Measurement will be made by the contract unit specified for Demolition. Measurement shall include the actual number of units of specified materials(s) removed or placed and accepted at the locations shown on the Contract Drawings, or as directed by the Project Manager, and in accordance with the Specifications.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, excavation, stockpiling, disposing, hauling off, watering, dust control, erosion and sediment control, as required in accordance with the Contract Drawings and Specifications. The price shall include sawing or otherwise effectively cutting the existing paving, curb and gutter or concrete pipe smoothly and squarely in a manner satisfactory to the Project Manager. The price shall include the removal and offsite disposal of all materials including any base course deemed unsuitable by the Project Manager. No payment will be made for the removal and/or replacement of any paving, curb and gutter or pipe sections damaged by the Contractor beyond the authorized limits of removal.

END OF SECTION 02 41 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 of the Work includes furnishing, placing, shoring, bracing, and anchorage of formwork, concrete reinforcement, accessories, and placing concrete in connection with cast-in-place concrete installation including installation of control and expansion joints, concrete curing and concrete finishing for perimeter wall, step, footer, pivot slab sections, as well as the reinstalled sun dial footer.
- B. Related Sections:
 - 1. Division 01 Section "Layout of Work and Surveys"
 - 2. Division 01 Section "Submittals".
 - 3. Division 01 Section "Contractor Quality Control".
 - 4. Division 01 Section "Erosion and Sedimentation Control".
 - 5. Division 31 Section "Earth Moving".
 - 6. Division 32 Section "Concrete Walks, Curbs, and Miscellaneous Flatwork".
 - 7. Division 04 Section "Stone Masonry".

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 REFERENCES

- A. Note: All references below shall be from the most current edition.
- B. American Concrete Institute (ACI):
 - 1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
 - 2. ACI 301 - Specifications of Structural Concrete for Buildings.
 - 3. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
 - 4. ACI 305 and 306 - Hot and Cold Weather Protection for Concrete.
 - 5. ACI 315 - Details and Detailing of Concrete Reinforcement.
 - 6. ACI 318 - Building Code Requirements for Reinforced Concrete.
 - 7. ACI 347 - Recommended Practice for Concrete Formwork.
- C. American National Standards Institute (ANSI):
 - 1. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
 - 2. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

- D. American Society for Testing and Materials (ASTM):
 - 1. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
 - 2. ASTM C33 - Concrete Aggregates.
 - 3. ASTM C94 - Ready-Mixed Concrete.
 - 4. ASTM C150 – Portland Cement.
 - 5. ASTM C260 - Air Entraining Admixtures for Concrete.
 - 6. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
 - 7. ASTM C494 - Water Reducing Admixtures for Concrete.
 - 8. ASTM C618 - Fly Ash Mineral Admixture for Concrete.
 - 9. ASTM C672 - Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
 - 10. ASTM-C800 - Curing Compound, Concrete, for New and Existing Surfaces.
 - 11. ASTM-C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
- E. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.
- F. Colorado Department of Transportation (CDOT) - Standard Specifications for Road and Bridge Construction.
- G. National Ready Mixed Concrete Association (NRMCA)

1.5 QUALITY CONTROL

- A. Reference Standards: Comply with following standards except where more stringent requirements are shown or specified:
 - 1. American Concrete Institute (ACI) Publications: Comply with the following unless modified by requirements in the Contract Drawings. Note: All references below shall be from the most current edition.
 - a. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
 - b. ACI 301 - Specifications of Structural Concrete for Buildings.
 - c. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
 - d. ACI 305 and 306 - Hot and Cold Weather Protection for Concrete.
 - e. ACI 315 - Details and Detailing of Concrete Reinforcement.
 - f. ACI 318 - Building Code Requirements for Reinforced Concrete.
 - g. ACI 347 - Recommended Practice for Concrete Formwork.
 - h. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
 - i. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
 - j. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 - k. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
 - l. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
 - m. ASTM C33 - Concrete Aggregates.
 - n. ASTM C94 - Ready-Mixed Concrete.
 - o. ASTM C150 - Portland Cement.
 - p. ASTM C260 - Air Entraining Admixtures for Concrete.
 - q. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
 - r. ASTM C494 - Water Reducing Admixtures for Concrete.
 - s. ASTM C618 - Fly Ash Mineral Admixture for Concrete.
 - t. ASTM C672 - Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.

2. ASTM-C800 - Curing Compound, Concrete, for New and Existing Surfaces.
3. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

B. Pre-Construction Conference: Conduct conference at location approved by Project Manager.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Special concrete finish subcontractor.
2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.

C. Refer to Part 3 QUALITY CONTROL for Contractor's testing requirements.

1.6 SUBMITTALS

A. Product Data: For each type of product specified.

B. Mix Designs:

1. Submit substantiating data for each concrete mix design specified for use to the Project Manager not less than four (4) weeks prior to first concrete placement. Data for each mix shall, as a minimum, include the following:
 - a. Mix identification designation (unique for each mix submitted).
 - b. Statement of intended use for mix.
 - c. Mix proportions.
 - d. Admixtures (must be approved by the Project Manager).
 - e. Wet and dry unit weight.
 - f. Entrained air content.
 - g. Design slump.
 - h. Strength qualification data.

C. Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI Detailing Manual SP 66. Include all accessories specified and required to support reinforcement.

D. Qualification Data: Installer to document for Owner's Representative experience on projects of similar scope and scale successfully completed within the past five (5) years.

E. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials and aggregates.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops.
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.
15. Epoxy joint filler.

F. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

G. Field quality-control reports.

H. Minutes of Pre-Construction conference.

1.7 DELIVERY, STORAGE AND HANDLING

A. General: Materials handling and batching shall conform to applicable provisions of ASTM C94.

B. Reinforcing: Unload and store reinforcing bars so they are kept free of mud and damage.

C. Hauling Time for Concrete: Deliver and discharge all concrete transmitted in a truck mixer, agitator, or other transportation device not later than one and one-half (1-1/2) hours, or three-hundred (300) revolutions of the drum after the initial mixing water has been added, whichever is earliest.

D. Extra Water:

1. Deliver concrete to site in exact quantities required by design mix.
2. Should extra water be required for workability before depositing concrete, and the water/cement ratio of accepted mix design will not be exceeded, the General Contractor's superintendent shall have the sole authority to authorize addition of water. Additional water shall not exceed one (1) gal/cu. yd. Any additional water added to mix after leaving batch plant shall be indicated on truck ticket and signed by person responsible.
3. Where extra water is added to concrete it shall be mixed thoroughly for thirty (30) revolutions of drum before depositing.
4. Water may be added at the site only once for each batch.
5. A full set of tests shall be performed after addition of water. Excessive slump or other out of range tests will be cause for rejection.

1.8 PROJECT CONDITIONS

A. Environmental Requirements:

1. Cold Weather Placement:

- a. When for three successive days prior to concrete placement the average daily outdoor temperature drops below forty degree (40°) F or when the average outdoor temperature is expected to drop below forty degrees forty degree (40°) F on the day of concrete placement, preparation, protection and curing of concrete shall comply with ACI 306R.
- b. Minimum temperature of concrete upon delivery shall conform to ACI 301 Table 7.6.1.1. Concrete at time of placement shall conform to minimum values of ACI 306R Table 1.4.1, and shall not exceed minimum values by more than twenty degrees (20°) F.
- c. Subject to acceptance of the Project Manager an accelerating admixture may be used. Admixtures shall meet requirements of Part 2. Calcium Chloride and other chloride-type accelerating admixtures are not allowed.
- d. Comply with concrete protection temperature requirements of ACI 306R. Record concrete temperatures during specified protection period at intervals not to exceed sixteen (16) hours and no less than twice during any twenty four (24) hour period.

2. Hot Weather Placement:

- a. When depositing concrete in hot weather, follow recommendations of ACI 305R.
- b. Temperature of concrete at time of placement shall not exceed eighty-five degrees (85°) F.
- c. When air temperatures on day of placement are expected to exceed ninety degrees (90°) F, mix ingredients shall be cooled before mixing. Flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for all or part of mix water.
- d. Retarding admixture may be used subject to acceptance of the Project Manager. Admixtures shall meet requirements of Part 2.
- e. Protect to prevent rapid drying. Start finishing and curing as soon as possible.

- B. Protection: Protect newly finished slabs from vandalism and all weather related damage. Protect finished slabs from mortar leakage from pouring of concrete above. Cover masonry walls, glazing, and other finish materials with polyethylene or otherwise protect from damage due to pouring of concrete.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Hand Placed Steel Forms: Hand placed steel forms are only to be used for sections that are straight and have no bend, radii, or curvature in the sections to be used.
- B. Plywood Forms: Are to be used on any section of concrete that have bends, radii or curvature. Forms shall be made of Douglas Fir or Spruce species; solid one side grade; sound, undamaged sheets with straight edges.
1. Curved elements shown on plans are to be constructed with smooth-curved forms. Faceted forms composed of straight sections will not be accepted.

- C. Lumber: Douglas Fir or Spruce species; construction grade; with grade stamp clearly visible.
- D. Form Coatings: Provide commercial formulation form coating compounds that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING STEEL

- A. Reinforcing Steel: ASTM A615, grade forty (40) for No.3 rebars and designated reinforcement, grade sixty (60) for all other bar; billet-steel deformed bars, uncoated finish.
- B. Tie Wire: ASTM A82, minimum sixteen (16) gauge annealed type.
- C. Chairs, Bolsters, Bar Supports, and Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete. Wood, brick or other unacceptable material is not permitted.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade sixty (60), plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class one (1) plastic-protected steel wire or CRSI Class two (2) stainless-steel bar supports.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
 - 4. On ground and where necessary, solid precast concrete blocks made for reinforcing support of heavy plastic chairs with adequate support/sand bases (as manufactured by General Technologies Inc., 4115 B Greenbriar Drive, P.O. Box 1503, Stafford, Texas 77477, Telephone No. 713-240-0550 or equivalent acceptable to Structural Engineer) shall be used to support the reinforcing steel in the slabs on grade. Maximum spacing of supports shall be 3'0" o.c. each way, unless noted otherwise on Drawings. Do not use pebbles, pieces of broken stone, common face brick, metal pipe, concrete block or wood blocks to support reinforcement.
 - 5. Inserts and anchors – The embedded dovetail anchor slots in concrete wall facing for stone masonry attachment shall be 22 gage (minimum thickness) stainless steel and shall be filled with foam to prevent concrete intrusion. All others inserts and anchors shall be galvanized unless noted otherwise on the drawings.

2.4 CONCRETE MATERIALS

- A. Provide materials in accordance with ACI 301, unless amended or superseded by requirements of this section or general notes on structural drawings.
1. General: Ready-mixed Concrete: ASTM C94. On-site mixed concrete not allowed.
 2. Cement: ASTM C150. Type II
 3. Fly ash: ASTM C618 Class C or F.
 4. Aggregate: ASTM C33.
 - a. Obtain from same source throughout project.
 - b. All sand and aggregates to meet C-33 Table 3 for Class 4S "Severe Weathering Region".
 - 1) Fine Aggregate: Clean, natural sand.
 - 2) Coarse Aggregate: Clean gravel or crushed stone.
 5. Water: ASTM C 94/C 94M, clean and not detrimental to concrete.

2.5 ADMIXTURES

- A. General: Unless specified, no admixtures may be used without specific approval of the Project Manager.
- B. Prohibited Products: Calcium chloride or admixtures containing more than one half of one percent (0.05%) chloride ions or thiocyanates are not permitted.
- C. Color Admixture: None required.
- D. Air-Entraining Admixture: ASTM C260. Subject to compliance with requirements, provide one of the following:
1. "Air Mix" by Euclid Chemical Co.
 2. "Darex ARA" by W. R. Grace.
 3. "Micro-Air" by Master Builders.
 4. Acceptable substitution.
- E. Water Reducing Admixture: ASTM C494, Type A. Subject to compliance with requirements, provide one of the following:
1. "Eucon WR-75" by Euclid Chemical Co.
 2. "Rheobuild 1000" by Master Builders.
 3. "Plastocrete 106" by Sika Chemical Co.
 4. Acceptable substitution.
- F. High Range Water Reducing Admixture (Superplasticizer): ASTM C494, Type F or G. Subject to compliance with requirements, provide one of the following:
1. "Eucon 37" by Euclid Chemical Co.
 2. "Pozzolith 400N" by Master Builders.
 3. "Sikament" by Sika Chemical Co.
 4. Acceptable substitution.
- G. Warm Weather Admixtures: ASTM C494. Use of admixtures will not relax warm weather placement requirements.

- H. Cold Weather Admixtures: ASTM C494. Use of admixtures will not relax cold weather placement requirements.

2.6 ACCESSORIES

- A. Form Release Agent: Colorless material which will not stain concrete, absorb moisture, contain oils or waxes, or impair natural bonding or color characteristics of coating intended for use on concrete. Subject to compliance with requirements, use one of the following:
 - 1. "Pro-Cote" by Protex.
 - 2. "Cast Off" by Sonneborn.
 - 3. "Debond" by L&M Construction Chemicals.
- B. Epoxy Adhesive: ASTM C881; two (2)-component material suitable for use on dry or damp surfaces. Subject to compliance with requirements, use one of the following:
 - 1. "Sikadur Hi-Mod LV" by Sika Chemical Corp.
 - 2. "Patch and Bond Epoxy" by Burke.
 - 3. "Epoxite" by A.C. Horn.
 - 4. "Sure-Poxy" by Kaufman Products, Inc.
 - 5. "Euco Epoxy 463 or 615" by Euclid Chemical Co.
- C. Expansion Joints:
 - 1. Interior Use or Exterior Use Where Sealants are Specified: Closed-cell polyurethane foam, or Expansion Joint Sponge Filler Material: Joint sponge filler material shall be closed cell neoprene or rubber conforming to ASTM D1056, Grade 2A3, Stock Number R-423-N (black) or R-443-N (gray) by Rubatex Corporation or equivalent acceptable to the Engineer. Material shall be glued securely to concrete surfaces with a compatible adhesive. Provide manufacturer's certification of compatibility with specified sealants where required.
 - 2. Exterior Use Where Sealants are not Specified: Premolded asphalt and fiber conforming to ASTM D994, one half inch (1/2") thick.
- D. Slip Joints:
 - 1. Speed Dowel Model PSD09/#4TX, nine inch (9") long sleeve to accommodate eighteen inch (18") smooth steel round bar. Manufactured by Sika/Greenstreak, (800)325-9504.
 - 2. Dowel, eighteen inch (18") long smooth round steel bar, five eighth inch (5/8") diameter. De-bur cut ends.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, shaped as sized on the drawings.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. 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.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials. Form-release agent is not to stain or discolor final concrete surface.

- I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete surface.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch (1") to the plane of exposed concrete surface, or as shown on the drawings.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (1") in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.
- J. Spray Curing Compound: All spray curing compound shall meet ASTM C-1315, and be prepared by manufacturer's instructions. Use per where required in Section 3.9.

2.7 ANTI-GRAFFITI COATING

- A. Manufacturer: Rain Guard International
- B. Product: VandlGuard™ Non-Sacrificial Anti-Graffiti Coating, or acceptable substitution.

2.8 CONCRETE MIX

- A. Refer to the City and County of Denver Right of Way Services approved materials list of pre-approved concrete mixes at the following website:

<https://www.denvergov.org/content/denvergov/en/right-of-way-services/engineering-regulatory-analytics/engineering-plan-review/manuals-regulations.html>

- B. All Concrete mixes from the approved list or submitted for approval shall meet the following criteria:
 - 1. Mix concrete in accordance with ASTM C94 and ACI 301 Chapter 3.
 - 2. Cement Content: Type II cement, minimum of five hundred sixty four (564) pounds per cubic yard.
 - 3. Fly ash: ASTM C618 Class C or F. Fly ash shall not exceed fifteen (15%) of total cementitious material by weight unless approved by Project Manager.
 - 4. Maximum water-cement ratio: 0.45.
 - 5. Slump: Four inches (4") maximum.
 - 6. Air Entrainment: Five percent (5%) to eight percent (8%).
 - 7. Aggregate Size: three quarter inch (3/4"), maximum.
 - 8. Deliver concrete and discharge all concrete transmitted in a truck mixer, agitator, or other transportation device not later than one and one-half (1-1/2) hours from batch time, or three hundred (300) revolutions of the drum after the initial mixing water has been added, whichever is earliest.
 - 9. During cold weather (below forty-five degree (45°) F), use heated water and aggregates if necessary to maintain concrete temperature between sixty degree (60°) F. and ninety degree (90°) F.
 - 10. Concrete for Footings, Walls, and Interior Slabs-on-Grade shall be Class B or Class D, as approved by the Project Manager.

11. Fly Ash: Per CDOT Standard Specifications for Road and Bridge Construction Section 701.02.

2.9 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
 1. When air temperature is between eighty-five (85°) and ninety degrees (90°) F, reduce mixing and delivery time from one and one-half (1-1/2) hours to seventy-five (75) minutes; when air temperature is above ninety degrees (90°) F, reduce mixing and delivery time to sixty (60) minutes.
 2. Project-Site Mixing: Not allowed without prior approval from Project Manager. If allowed, submit process description to Project Manager for approval prior to construction.

PART 3 - EXECUTION

3.1 QUALITY CONTROL

- A. Requirements of Regulatory Agencies: Comply with all applicable provisions of the state and local building and safety codes.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer, unless otherwise approved by Project Manager.
- C. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that 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" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- D. Testing: All testing shall be completed by the Contractor at their expense unless otherwise specified by the contract.
- E. Testing Agency Qualifications: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures. Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

- F. Testing Frequency: Obtain at least one composite sample for each one hundred (100) cubic yards, or fraction thereof of each concrete mixture placed each day.
- a. When frequency of testing will provide fewer than five (5) compressive-strength tests for each concrete mixture, testing shall be conducted from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture. 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 mixture.
 4. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one (1) set of four (4) standard cylinder specimens for each composite sample.
 5. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at twenty-eight (28) days. and keep one for backup in the event a sample should break.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at twenty-eight (28) days.
- G. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than two-hundred (200) psi.
- H. Test results shall be reported in writing to Project Manager, concrete manufacturer, and Contractor within forty-eight (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 twenty-eight (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7) and twenty-eight (28) day tests.
- I. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Project Manager.
- J. Concrete work will be considered defective if it does not pass tests and inspections.
- K. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- L. Prepare test and inspection reports.
- M. Record of Work: A record shall be kept by the Contractor listing the time and date of placement of all concrete for the structure. Such record shall be kept until the completion of the project and shall be available to the Project Manager for examination at any time.
- N. Mockups: If requested by the Project Manager, prior to starting any concrete work, provide a sample panel using materials indicated for project work. For each type, color and finish of concrete specified, build panel at the site of full thickness and approximately ten feet (10') by 10 feet (10'), including reinforcement, expansion joints, control joint, scales, fillers, and one radial edge. Provide the workmanship proposed for the work. Correct and replace sample

panel until Project Manager's acceptance of the work. Retain panel(s) during construction as a standard for completed paving work.

1. Build panel approximately one-hundred (100) sq. ft. in the location indicated or, if not indicated, as directed by Project Manager.
 2. Approved mockups may become part of the completed Work if approved prior to the construction of the mock up and is undisturbed at time of Substantial Completion.
 3. Notify the Project Manager a minimum of seven (7) days in advance of dates and times when mockups will be constructed.
 4. Obtain the Project Manager's written approval of the mockups before starting construction.
 5. If the Project Manager determines that the mockup does not meet the requirements, demolish and remove from the site and cast another until the mockup is approved.
 6. Maintain the mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Demolish and remove mockups when directed by Project Manager.
- O. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.

3.2 FORMWORK ERECTION

- A. Construct formwork to maintain tolerances in accordance with ACI 301.
- B. Verify lines, levels, and measurement before proceeding with formwork.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 1. Class A, one eighth inch (1/8") for smooth-formed finished surfaces.
 2. Class B, one-quarter inch (1/4") for rough-formed finished surfaces.
- D. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- E. Form Tie Holes: Form tie holes are to be installed in locations shown on drawings filled with grout and finished to match adjacent concrete surface.
- F. Elements shown as curved on plans are to be formed with flexible form material to form smooth curve transitions. Disjointed, poorly transitioned form alignments will not be accepted. Curved sections formed with straight facets will not be accepted.
- G. Contractor shall notify the Project Manager a minimum of forty eight (48) hours in advance of placing concrete for review of formwork. Contractor shall make correction within twenty four (24) hours of review. If formwork is not in place at time of the scheduled inspection, then the Contractor will be responsible for compensation of the Project Manager's time and expenses per the General Contract Conditions.

- H. Minimize form joints. Symmetrically align form joints and make watertight to prevent leakage of mortar.
- I. Provide chamfer strips on all exposed corners or as indicated on construction documents.
- J. Do not apply form release agent other than specified materials where concrete surfaces receive special finishes or applied coatings which may be affected by agent. Soak contact surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.
- K. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, dowels, anchors, and other inserts and embedded materials.
- L. Do not remove forms, shoring and bracing until concrete has sufficient strength to support its own weight, and construction and design loads which may be imposed upon it.
- M. During cold weather, remove ice and snow from forms. **Do not** use deicing salts. Do not use water to clean out completed forms unless formwork and construction proceed within heated enclosure. Use compressed air to remove foreign matter.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than fifty degrees (50°) F for twenty four (24) hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
 - 1. Leave formwork for structural elements that supports weight of concrete in place until concrete has achieved at least seventy percent (70%) of its twenty-eight (28) day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Project Manager.

3.4 SHORES AND RESHORES

- A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.6 REINFORCEMENT

- A. Place, support, and secure reinforcement against displacement.
- B. Locate reinforcing splices per ACI 318 unless indicated otherwise on the Contract Drawings.

3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Project Manager.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 1. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 2. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- D. Joint Sealants: See Division 3 Section "Concrete Paving Joint Sealants".

3.8 CONCRETE PLACEMENT

- A. Contractor's Review: Contractor shall inspect forms and reinforcing prior to concrete placement to assure accurate placement of embedded items and overall acceptability.
- B. Project Manager's Review: Contractor shall provide minimum of forty-eight (48) hours notice to the Project Manager to allow review of forms and reinforcement before concrete is placed and to observe placing of concrete.
- C. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

- D. Do not add water to concrete during delivery, at Project site, or during placement. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least six inches (6") into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for concrete pavements in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces as indicated on drawings.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
 6. Allow time for bleed water to appear, then scrape or push off all bleed water. Do not work water into surface.
 7. Final level, light bull float, but do not trowel surface.
 8. Broom or drag surface or other specified finish, per Subsection 3.8 this Section.
 9. Do not use evaporative retarders as finishing aid.
 10. Maximum height of concrete free fall is 4 feet.
 11. Pump concrete or use tremie having varying lengths for placing concrete in columns and walls to prevent free fall of more than 4 feet.
 12. Concrete shall not be dropped through reinforcing steel nor subjected to any other procedure which will cause segregation.
- F. Cold-Weather Placement: Comply with ACI 301, ACI 304, ACI 306R 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 average high and low temperature is expected to fall below forty degrees (40°) F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301, ACI 304, ACI 305R, and as follows:

1. Maintain concrete temperature below ninety degrees (90°) 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 prohibited.
 2. Spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
- H. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.

3.9 FINISHING

- A. Rough Form Finish: All texture imparted by form facing material, including tie holes and defective areas, shall be repaired and patched, and all fins and other projections exceeding one-quarter inch (1/4") shall be removed.
- B. Smooth Form Finish: Use form material to impart smooth, hard, uniform texture, and arrange form panels in orderly and symmetrical pattern with minimum seams. Repair and patch defective areas and completely remove and smooth all fins and other projections.
- C. Rubbed Finish: None required.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 CONCRETE CURING, PROTECTION, AND SURFACE TREATMENTS

- A. General:
1. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Maintain concrete with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of concrete.
 2. Curing shall commence as soon as free water has disappeared from the concrete surface after placing and finishing. The curing period shall be seven days for all concrete unless test cylinders, made and kept adjacent to the structure and cured by the same methods, are tested with the average compressive strength equal to seventy percent (70%) of the specified twenty-eight (28) day strength.
 3. Curing shall be in accordance with ACI 301 procedures. Avoid rapid drying at the end of the curing period. During hot and cold weather, cure concrete in accordance with ACI 305R and ACI 306R.
- B. Curing Methods: Perform curing of concrete by moisture curing, by moisture-retaining cover curing, by curing compound, and by combinations thereof, as herein specified and in accordance with ACI 308.1. Coordinate with and choose a curing method that is compatible with the requirements for subsequent material usage on the concrete surface.
1. Provide moisture retaining cover curing as follows: Cover concrete surfaces with a moisture-retaining cover for curing concrete, placed in widest practical width with sides and ends lapped at least three inches (3") and sealed by waterproof tape or adhesive.

- Immediately repair any holes or tears during curing period using cover material and waterproof tape.
2. Provide curing and sealing compound to interior slabs left exposed, and to exterior slabs, walks and curbs as follows:
 - a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within thirty (30) minutes). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to rainfall within three hours after initial application.
 - b. Maintain continuity of coating and repair damage during period.
 - c. Do not use membrane curing compounds on surfaces which are to be covered with materials applied directly to concrete: liquid floor hardener, waterproofing, dampproofing, painting, and other coating and finish materials.
 - C. Curing Formed Surfaces: Where wooden forms are used, cure formed concrete surfaces by moist curing with forms in place for full curing period or until forms are removed. When forms are removed, continue curing by methods specified above for specified curing time.
 - D. Curing Unformed Surfaces:
 1. Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
- 3.11 FORM REMOVAL
- A. Removal of Forms: Supplement and Modify ACI 301 as follows:
 1. ACI 301 4.5.4: Formwork not supporting weight of concrete such as sides of grade beams, walls, and similar parts of the work, may be removed after cumulatively curing at not less than fifty degrees (50°) F for twenty-four (24) hours after placing the concrete provided:
 - a. The concrete is sufficiently cured to be undamaged by form removal.
 - b. Required shores and supports are so arranged that they will not be loosened or disturbed during form removal.
 - c. Supplemental curing and protection is provided for exposed concrete surfaces.
- 3.12 ANTI-GRAFFITI COATING
- A. None required.
- 3.13 TOLERANCES
- A. Formed Surfaces and Building Lines: Conform to ACI 301 4.3.
 - B. Slab Finishing Tolerances: See Division 32 Section "Concrete Walks, Curbs, and Miscellaneous Flatwork".
 - C. Embedded Items: Unless noted otherwise on drawings, tolerances shall be as follows:
 1. Anchor Bolts:
 - a. Adjacent anchor bolts in a group receiving a single fabricated setting piece: Plus or minus one-eighth inch (1/8").
 - b. Location and alignment of anchor bolt groups from designated location and alignment: Plus or minus one-eighth inch (1/8").

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Project Manager. Remove and replace concrete that cannot be repaired and patched to Project Manager's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a Number sixteen (#16) sieve, using only enough water for handling and placing. Achieve approval of Project Manager prior to any patching as to location of patches and patch material.
- C. Patch Testing: On a portion of the work which will, in the finished condition, be concealed, test patch materials and methods and obtain Project Manager's approval prior to patching concrete surfaces needing repair that will be visible in the final construction.
- D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than one half inch (1/2") in any dimension to solid concrete. Limit cut depth to three quarter inch (3/4"). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color and texture. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Project Manager.
- E. Repairing Unformed Surfaces: Test unformed surfaces, such tops of walls, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped for trueness of slope and smoothness; use a sloped template.
 - 1. After obtaining approval of Project Manager, repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of one-one hundredths inch (0.01") wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - a. If, after repairs are complete, the Project Manager deems the repairs did not successfully correct the original deficiencies, the pavement or concrete element in question is to be removed and replaced per Subsection 3.13.E.1. above.
 - 2. After concrete has cured at least fourteen (14) days, test for low and high spots in finished surface. Areas that do not conform to the tolerances set forth in Division 32 and in other reference standards identified in this specification are to be sawcut to the nearest joint as approved by the Project Manager, defective concrete removed, and new conforming paving reinstalled. Color and finish is to match adjacent concrete.

3. If approved by Project Manager, repair random cracks and single holes one inch (1") or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least seventy-two (72) hours.
- F. Perform structural repairs of concrete, subject to Project Manager's approval, using epoxy adhesive and patching mortar.
- G. Repair materials and installation not specified above may be used, subject to Project Manager approval.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Cast-in-Place Concrete.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, excavation, stockpiling, disposing, hauling off, watering, dust control, erosion and sediment control, compaction, sub-grade preparation, formwork, placing of concrete, reinforcing, joints, curing, finishing and all other items required to complete the work as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 03 30 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for stripping sod, and removing and disposing of evergreen shrub mass vegetation and debris.
- B. Related Sections:
 - 1. Division 01 Section "Temporary Facilities and Controls".
 - 2. Division 01 Section "Erosion and Sedimentation Control".
 - 3. Division 01 Section "Tree Retention and Protection".
 - 4. Division 31 Section "Earth Moving"
 - 5. Division 32 Section "Tree Transplanting".

1.3 DEFINITIONS

- A. The term "sod stripping" shall be used when the vegetative material to be removed is mowable and generally less than twelve-inches (12") tall.
- B. The term "tree removal" refers to individual woody plants with a caliper over four-inches (4"). Any removals shall be performed by a tree Contractor licensed through Denver Forestry.
- C. The term "clearing" refers to removing and disposing trees, brush, stumps, logs, grass, weeds, roots, decayed vegetable matter, poles, stubs, rubbish, refuse dumps, sawdust piles, and loose boulders of one cubic yard (1 yd³) or less existing outside of the construction limits, debris resting on or protruding through the ground surface, or appearing on the construction limits before final acceptance of the work. Clearing also includes removing and disposing of obstructions, such as fences, bridges, buildings, and other incidental structures within the construction limits and shown on the Site Demolition Plans.
- D. The term "grubbing" refers to removal from the area within the construction limits and proper disposal of all objectionable matter defined above under clearing, which is embedded in the underlying soil. Grubbing also includes removing and properly disposing of sidewalks, driveways, catch basins, drop inlets, manholes, curbing, retaining walls, utilities, foundations, paved floors, underground tanks, and portions of plants to be removed that are below grade, and other structures within the construction limits.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- F. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow, and ; reasonably free of subsoil, clay

lumps, gravel, and other objects more than two-inches (2”) in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

- G. Plant-Protection Area: Area surrounding shrub beds or massings, or other vegetation or sensitive areas to be protected during construction, and indicated on Contract Drawings.
- H. Tree-Protection Area: Area surrounding individual trees or groups of trees to be protected during construction, see Division 01 Section “Tree Retention and Protection”.
- I. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. All materials except for stripped topsoil and those materials indicated to remain or to be stockpiled, shall remain the property of the City. All other materials shall be removed at the Contractor's expense.

1.5 SUBMITTALS

- A. Existing Conditions: Documentation of existing conditions, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed digital photographs or videos.
 - 2. Include plans and notations to indicate specific damaged conditions of existing construction, site elements, and landscape.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions. Submit to Project Manager prior to start of construction.

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 Project Manager.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Project Manager.
- B. Improvements on Adjoining Property: Not allowed without prior approval from Project Manager. Work only within Work Limit Line as defined on drawings.
- C. Salvable Items: Carefully remove items indicated to be salvaged and store on City property where indicated.
- D. Protection and Repair of Underground lines:
 - 1. Existing Public Utilities: Locate existing underground utilities within the limits of work per General Contract Conditions, Article 804 Protection of Municipal, Public Service or Public Utility Systems. Request utility locates seventy two (72) hours in advance of any excavations by calling the Utility Notification Center of Colorado at 811. The contractor is responsible for providing written and graphical documentation from the utility owner.

Take whatever precautions are necessary including potholing to verify location and depth to protect these underground lines from damage. Should unmarked or incorrectly marked utilities or other piping be encountered during excavation, notify the Project Manager immediately for direction. If damage does occur, all damage shall be repaired by the utility owner and all costs of such repair shall be paid by the contractor. Only written all clears will be acceptable, verbal all clears will not be accepted.

2. Existing Private Utilities: Locate existing underground utilities within the limits of work per General Contract Conditions, Article 804 Protection of Municipal, Public Service or Public Utility Systems. The contractor is required to contact all private utility companies including Denver City departments to locate all private utilities. The contractor is responsible for providing written and graphical documentation from the private utility owner. The request for locates shall be a minimum of seventy two (72) prior to proceeding with any excavation. If, after such requests, private utilities are encountered and damaged by the contractor these shall be repaired at no cost to the city. If the contractor damages staked or located private utilities they shall be repaired by the utility owner and all costs of such repair shall be paid by the contractor. Only written all clears will be acceptable, verbal all clears will not be accepted.

- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and tree and or plant protection measures are in place.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect existing site conditions from damage during construction.
 1. Restore existing conditions damaged by Contractor during the work of this Contract to their original condition, as acceptable by Project Manager.

3.2 TRANSPLANTING

- A. None required.

3.3 CLEARING

- A. Remove brush and vegetation from areas designated to be cleared. As directed by Project Manager, trim low hanging, unsound, or unsightly branches on existing trees and shrubs designated to remain. All cuts shall be in accordance with Denver Forestry standards.

3.4 GRUBBING

- A. Remove all stumps, roots, and debris a minimum of twelve-inches (18") below finish grade in all areas as required. Use hand methods for grubbing inside drip line of trees to remain. Backfill and compact stump and root holes to a maximum of eighty five percent (85%) in landscape areas and ninety five percent (95%) under hardscape or as directed by the City Forester and Project Manager.

3.5 TOPSOIL STRIPPING

- A. None required.

3.6 SOD STRIPPING

- A. Strip sod in all areas to be re-graded to a depth of one-inch (2”), so that a relatively clean dirt surface remains.

3.7 TREE REMOVAL

- A. None required.

3.8 DISEASED TREE REMOVAL AND DISPOSAL

- A. None required.

3.9 DISPOSAL

- A. Haul and dispose of all removed materials, trash, debris and waste materials legally outside of the City’s property. All recyclable materials shall be hauled to nearest recycling center and any non-recyclable materials shall be hauled to Denver Arapahoe Disposal Site (DADS). DADS Disposal tickets shall be provided to the Contractor by Project Manager.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Clearing and Grubbing.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor. The lump sum price shall include all clearing and grubbing of miscellaneous debris or items defined in Part 1 - General, including all other work necessary to ensure a clear dirt surface remains on the site. Price shall include the removal and offsite disposal of all materials. All recyclable materials shall be hauled to the nearest recycling center and any non-recyclable materials shall be hauled to DADS. DADS disposal tickets shall be provided to the Contractor by the Project Manager. No payment will be made for the removal of any brush and vegetation damaged by the Contractor beyond the authorized limits of removal.

END OF SECTION 31 11 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Report Documentation
 - 1. Ground Engineering Consultants Inc. Subsurface Exploration Investigation and Report, March 26, 2008.

1.2 SUMMARY

- A. This Section includes the requirements for excavation, re-grading, filling, back filling, compaction, hauling, and legal off-site disposal of spoil materials to meet the required lines and grade as specified to complete the work. Including removal and disposal of all soil located beneath the upper terrace, excavation for perimeter concrete footers and curbs, import placement shaping and compaction of structural fill material to be placed in the void created by utility vault removal and under new upper terrace drainage medium.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 01 Section "Clearing and Grubbing".
 - 3. Division 02 Section "Demolition".
 - 4. Division 31 Section "Excavation and Backfilling of Trenches".
 - 5. Division 32 Section "Topsoil".

1.3 DEFINITIONS

- A. Excavation: The removal of material encountered to subgrade or over-excavation and subsequent disposal or placement of materials removed.
- B. Unclassified Excavation: The term "unclassified excavation", as used herein, includes the excavation of all materials required for the work obtained within construction limits of project, including bedrock, surface boulders, wasted sections of concrete, asphalt or other debris including historic landfills that may be encountered. All excavation will be considered unclassified regardless of the nature of material encountered.
- C. Classified Excavation: The term "classified excavation", as used herein, defines the soil conditions that are expected to be encountered and makes provisions for measurement and payment of any rock encountered at an agreed upon unit price.
- D. Unauthorized Excavation: Inadvertent or purposely removing materials beyond indicated subgrade elevations or dimensions without specific direction of the Project Manager. Unauthorized excavation, as well as remedial work resulting from unauthorized excavation shall be at Contractor's expense.

- E. Unsuitable Materials: For the purposes of classified excavation, unsuitable material shall be defined as material below subgrade elevation that exhibits excessive pumping or that does not meet density requirements due to unsatisfactory material as determined by geotechnical engineer and/or Project Manager.
- F. Subgrade: The undisturbed earth or the compacted soil layer immediately below proposed pavement topping materials.
- G. Structure: Walls, foundations, slabs, pavement or other man-made stationary features occurring above or below ground surface.
- H. Structural Fill: The term “structural fill”, as used herein, includes soil materials used for general site filling under pavements or structures.

1.4 SUBMITTALS

- A. Samples for Verification: For the following products, in sizes indicated below:
 - 1. Warning Tape: Twelve-inches (12”) long; of each color.
- B. Qualification Data: For qualified testing agency.
- C. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Location of soil source.
 - 2. Classification according to ASTM D 2487.
 - 3. Laboratory compaction curve according to ASTM D 698.
- D. Provide one (1) cubic foot sample of imported backfill material for approval by Project Manager.
- E. For imported backfill materials, general or structural, the Contractor shall provide, at a minimum, a soils report indicating gradation tests, liquid limit, plasticity index and standard proctor density test and free of environmental contaminants. Depending on the use of the imported backfill materials the Project Manager may request that a soils analysis be performed to determine percent organic content of the soils, salt levels, and environmental contaminants of concern. Division 32 Section “Topsoil” for additional information.
- F. Pre-excavation Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 PROJECT CONDITIONS

- A. Protection and Repair of Underground lines:
 - 1. Existing Public Utilities: Locate existing underground utilities within the limits of work per General Contract Conditions, Article 804 Protection of Municipal, Public Service or Public Utility Systems. Request utility locates seventy two (72) hours in advance of any excavations by calling the Utility Notification Center of Colorado at 811. The Contractor is responsible for providing written and graphical documentation from the utility owner. Take whatever precautions are necessary including potholing to verify location and depth to protect these underground lines from damage. Should unmarked or incorrectly marked

utilities or other piping be encountered during excavation, notify the Project Manager immediately for direction. If damage does occur, all damage shall be repaired by the utility owner and all costs of such repair shall be paid by the Contractor. Only written all clears will be acceptable, verbal all clears will not be accepted.

2. Existing Private Utilities: Locate existing underground utilities within the limits of work per General Contract Conditions, Article 804 Protection of Municipal, Public Service or Public Utility Systems. The Contractor is required to contact all private utility companies including Denver City departments to locate all private utilities. The Contractor is responsible for providing written and graphical documentation from the private utility owner. The request for locates shall be a minimum of seventy-two (72) hours prior to proceeding with any excavation. If, after such requests, private utilities are encountered and damaged by the Contractor these shall be repaired at no cost to the city. If the Contractor damages staked or located private utilities, they shall be repaired by the utility owner and all costs of such repair shall be paid by the Contractor. Only written all clears will be acceptable, verbal all clears will not be accepted.

- B. Use of Explosives: Use of explosives is not permitted.
- C. Protection of Persons and Property: The Contractor is responsible for installing barricades and posting warning lights with all open excavations occurring as part of the work.
 1. Protect structures, utilities, walkways, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- D. Environmental Requirements: Blasting is not permitted. Employ jack hammering and other loud noises and methods sparingly; comply with all applicable noise abatement ordinances or regulations. Onsite burning is not allowed.
- E. Existing Benchmarks: Carefully preserve and maintain existing benchmarks, vertical/horizontal control, monuments, property line pipes and pins, and other reference points. If disturbed or destroyed, restore or replace at no additional cost to the City.
- F. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Division 01 Sections "Temporary Facilities and Controls" and Division 31 Section "Clearing and Grubbing," are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: All fill material, regardless of intended use category, must be clean and free from organic matter, roots, brush or other vegetation, trash, debris or other detrimental substances, and rocks or unbroken lumps larger than three-inches (3"). Project Manager to approve material prior to placement.
 1. The Contractor is responsible for furnishing load tickets and providing a daily log of cubic yards of soil materials imported or exported.
- B. Structural Fill: Shall be Class 1 material composed of non-organic mineral aggregates and soil from excavations of existing soils obtained from on-site or imported fill, including granular or aggregate base course from removed pavements. Fill containing organic matter or any other

deleterious substances, including overly wet soils, bedrock, or high swell content soils will not be accepted. If sufficient materials meeting the above requirements are not available from on-site sources, provide additional material obtained from off-site sources and approved by the testing and inspections agency, at no additional cost to the City. The soil must be compactable and pass, at minimum, a proof roll prior to being accepted for supporting paving materials.

- C. On-Site Topsoil: None required.

2.2 ACCESSORIES

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

- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of six-inches (6”) wide and four (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 thirty-inches (30”) deep; colored as follows:
 - 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 EXAMINATION

- A. Examine areas where the Work of this Section will be performed for compliance with requirements and conditions affecting installation and performance.
 - 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 the work area.
 - 2. Verify that final grades are completed in accordance with the drawings.

- B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by Project Manager.

3.2 GENERAL PROCEDURES

- A. Comply with Division 01 Section “Erosion and Sedimentation Control” and all local, state and national erosion control requirements.

- B. Erosion Control shall be maintained during all phases of site excavation and site development and maintained throughout the construction period in order to protect adjacent properties, streets, and storm sewers from erosion and sediment runoff during the construction process. Do not commence excavation and grading work until erosion control measures are in place and have been inspected and approved by the Wastewater Management Inspector. Contractor shall be responsible for maintaining erosion control measures throughout construction. Frequent monitoring, cleaning and other work required for proper operation shall be Contractor's responsibility. Contractor shall modify/replace all erosion control measures to fit field conditions following direction for corrective actions from Project Manager and or Wastewater Management Inspector.

3.3 QUALITY CONTROL

- A. Coordinated and paid for by Contractor.
- B. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.
- C. Comply with requirements within project Geotechnical Report.
- D. Codes and Standards: Comply with all applicable local, state and Federal rules, regulations and ordinances concerning sloping of excavation, trenching and safety of workers, including the latest version of OSHA requirement.
- E. Testing Agency: All testing required to determine compliance for the work of this section will be completed as specified in Division 01 Section "Contractor Quality Control". Testing Agency to test the following, and as stated throughout this Section:
 - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 - 2. Determine that fill material and maximum lift thickness comply with requirements.
 - 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- F. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- G. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Project Manager.
- H. 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 one test for every two thousand (2,000) sq. ft. or less of paved area or building slab, but in no case fewer than three (3) tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 50 feet (50') or less of wall length, but no fewer than two tests.

3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every one hundred fifty feet (150') or less of trench length, but no fewer than two tests.
4. Landscaped areas: At least one test every twenty thousand (20,000) sq. ft or less of disturbed landscaped area, but in no case fewer than two tests.

- I. 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 materials to depth required; re-compact and retest until specified compaction is obtained.
- J. Submit testing report documentation to Project Manager per Division 01 Section "Quality Assurance".

3.4 DEWATERING

- A. Wherever possible, prevent surface water and subsurface or groundwater from flowing into excavations and from flooding the project site and surrounding area.
- B. Contractor shall be required to dewater excavated areas by pumping, or otherwise control the water so that the project can be constructed in accordance with the plans. Any controlling of the water must be performed in such a manner that recently constructed portions of the project are not damaged. Repairs shall be at the Contractor's expense.
- C. Damage to adjacent property that results from the Contractor's alteration of any surface drainage, ground water flows or pumped water shall be repaired by the Contractor at no additional cost to the City.

3.5 GROUND SURFACE PREPARATION

- A. Complete clearing and grubbing operations in accordance with Division 31 Section "Clearing and Grubbing". Where new material is to be placed on compacted subgrade, scarify ground surface until surface is free from ruts, hummocks or other uneven features, which would prevent uniform compaction and bond between old and new material.
- B. Prior to placing any new sections of asphalt or concrete pavement, the entire subgrade shall be scarified to a depth of six-inches (6"). In areas where existing pavement is to be removed and replaced the existing compacted subgrade may be reused if the subgrade meets specified compaction. In areas of existing subgrade that do not meet the specified compaction, materials shall be removed, replaced and compacted to meet the specified proctor density. Adjust moisture content and compact as hereinafter specified.

3.6 STRIPPING AND STOCKPILING TOPSOIL

- A. None required.
- B. Placing topsoil, refer to Division 32 Section "Topsoil".

3.7 EXCAVATION

- A. Stability of excavations: Comply with local codes, ordinances, and requirements of agencies having jurisdiction to include the latest revision to OSHA standards.

- B. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of +/- one tenth foot (0.1'), and extending a sufficient distance to permit installation of services and other construction, and for inspection.
- C. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as indicated within a tolerance of +/- one tenth foot (0.1').
- D. 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. Twenty four-inches (24") outside of concrete forms other than at footings.
 - b. Twelve-inches (12") outside of concrete forms at footings.
 - c. Six-inches (6") 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. Six-inches (6") beneath bottom of concrete slabs-on-grade.
 - f. Six-inches (6") beneath pipe in trenches, and the greater of twenty four-inches (24") wider than pipe or forty two-inches (42") wide.
- E. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Project Manager and approved by Project Manager. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
 - a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
 2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. Twenty four-inches (24") outside of concrete forms other than at footings.
 - b. Twelve-inches (12") outside of concrete forms at footings.
 - c. Six-inches (6") 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. Six-inches (6") beneath bottom of concrete slabs-on-grade.
 - f. Six-inches (6") beneath pipe in trenches, and the greater of twenty four-inches (24") wider than pipe or forty two-inches (42") wide.

3.8 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions shown on Contract Drawings within a tolerance of plus or minus one tenth foot (0.1'). 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. Pile Foundations: Stop excavations six to twelve-inches (6" – 12") above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.

3.9 EXCAVATION FOR WALKS AND PAVEMENTS

- A. See project Geotechnical Report.
- B. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.1 foot.
- C. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.
 - 1. Prior to placing the pavement section, the entire subgrade should be scarified to a depth of six-inches (6"), adjusted to a moisture content near optimum and compacted as indicated in the Geotechnical Report.

3.10 SUBGRADE INSPECTION

- A. Notify Project Manager when excavations have reached required subgrade.
- B. If Project Manager determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade in locations identified by the Project Manager with a pneumatic-tired and loaded ten (10-wheel), tandem-axle dump truck weighing not less than fifteen (15) tons 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. Limit vehicle speed to three (3) mph.
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Project Manager, 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.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Project Manager, without additional compensation.

3.11 SPECIAL CONDITIONS

- A. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than thirty five degrees (35°) F.

- B. Dust Control: Provide dust control to alleviate dust nuisance to the public, to adjacent properties and other work underway at the project site.
- C. Unanticipated Conditions: Notify the Project Manager immediately upon finding subsurface or other conditions which are not shown or which cannot be reasonably assumed from existing surveys. Secure Project Manager's instructions before proceeding with further work in such areas.
- D. Unsatisfactory Soils: Remove or otherwise correct unsanitary, sour, or otherwise unsatisfactory soil. Remove contaminated or unsuitable material from under paved areas.
- E. Additional Excavation: When excavation has reached required subgrade elevations, the Contractor shall contact the testing agency, which will make an observation of conditions. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by the testing agency.

3.12 FILL AND BACKFILL

- A. General: Place soil material in layers to required subgrade elevations, for each area classification listed below, using materials specified in this Section.
 - 1. Under grassed areas, use satisfactory, excavated or borrow material.
 - 2. Under walks and pavements, use satisfactory, excavated or borrow materials, or a combination to meet structural fill requirements.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
 - 1. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
 - 2. Removal of all trash and debris from excavation.

3.13 PLACEMENT AND COMPACTION

- A. Abide by requirements of project Geotechnical Report unless otherwise directed by Project Manager.
- B. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Ground surfaces that are steeper than four-to-one (4:1) (horizontal to vertical) shall be stripped of vegetation, scarified to a depth of six-inches (6") and create excavated benches to ensure that fill material will bond with the existing surface.
 - 1. Present remediation options to Project Manager for any soils that do not meet the specified standard proctor density to bring those soils into compliance with the specifications.
- C. Place backfill and fill materials in layers not more than eight-inches (8") in loose depth for material compacted by heavy compaction equipment, and not more than four-inches (4") in loose depth for material compacted by hand-operated tampers, each layer to be compacted to meet requirements herein.
- D. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry

density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

E. Compaction of Fill for Hardscape Areas:

1. Select fill material shall be placed and mixed in evenly spread layers. After each fill layer has been placed, it shall be uniformly compacted. Fill materials shall be placed such that the thickness of loose material does not exceed eight-inches (8") and the compacted lift thickness does not exceed six-inches (6").
2. Compaction shall be obtained by the use of sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other equipment required to meet specifications. Granular fill shall be compacted using vibratory equipment or other equipment required to meet specifications. Compaction of each layer shall be continuous over the entire area. Compaction equipment shall make sufficient passes to ensure that the required density is obtained. Refer to Paragraph 3.12.I herein for criteria.
3. Prior to placement of any base or surfacing materials, one hundred percent (100%) of the subgrade shall be proof rolled with a fully loaded tandem-axle truck.

F. Compaction of Landscape Slope Areas:

1. Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compaction operations shall be continued until slopes are stable, compact to a density as specified in Paragraph 3.12.I. Permanent fill slopes shall not exceed four-to-one (4:1) (horizontal to vertical).
2. Where natural slopes are steeper than twenty percent (20%) in grade and the placement of fill is required, cut benches shall be provided at the rate of one bench for each five feet (5') in height (minimum of two benches). Benches shall be at least ten feet (10') in width. Fill shall be placed on completed benches as outlined within this specification.

G. Control soil and fill compaction, providing minimum percentage of density specified. Correct improperly compacted areas or lifts as directed if soil density tests indicate inadequate compaction.

H. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.

1. Moisture Content: The Contractor may be required to add moisture to the excavation materials in the stockpile area if it is not possible to obtain uniform moisture content by adding water on the fill surface. The Contractor may be required to rip or disc the fill soils to provide uniform moisture content through the soils.
2. The application of water to the embankment materials shall be made with any type of watering equipment which will give the desired results. Water jets from the spreader shall not be directed at the embankment with such force that fill materials are washed out.
3. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
4. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by disking, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

I. Density Tests: Field density tests shall be made by the Contractor per Division 01 Section "Contractor Quality Control" locations and depths selected by the Project Manager. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several-inches. Density tests

shall be taken in compacted material below the disturbed surface. When density tests indicate that the density or moisture content of any layer of fill or portion thereof is below that required, the particular layer or portion shall be reworked until the required density or moisture content has been achieved. Criteria for acceptance are as follows:

1. Under pavements and structures: Intervals and quantities of tests required shall be established by the Project Manager. On-site or imported clay materials shall be compacted to at least ninety five percent (95%) of maximum standard Proctor dry density (ASTM D 698) at moisture content within two percent (2%) of optimum. Granular material, whether imported or developed on-site, shall be moisture conditioned to within two percent (2%) of optimum and compacted to at least 95% of maximum modified Proctor dry density (ASTM D 1557).
2. Under landscape areas (top 12-inches): Eighty five percent (85%) of maximum standard Proctor dry density at moisture content within two percent (2%) of optimum (ASTM D 698).

3.14 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. Do not store within drip line of existing trees or within Tree Protection Fencing. Refer to Division 01 Section "Tree Retention and Protection".

3.15 GRADING

- A. General: Uniformly grade areas within project limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations or contours are indicated or between such points and existing grades.
- B. Subgrade tolerances are as follows:
 1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than one tenth foot (0.10') above or below required subgrade elevations.
 2. Pavements: Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than two one-hundredths foot (0.02') above or below required subgrade elevation.
- C. Under no circumstances shall variations from specified grade elevations create any ponding or retention of water on intermediate pavement levels, or finished surfaces.

3.16 PLACING STOCKPILED TOPSOIL

- A. Refer to Division 32 Section "Topsoil".

3.17 FIELD QUALITY CONTROL

- A. Special Inspections: Project Manager may engage a qualified special inspector to perform the inspections in addition to the Contractors requirements for testing for the purposes of verifying results of Contractor's Testing Agency.

3.18 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 Project Manager; reshape and re-compact.
- 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.

3.19 MAINTENANCE

- A. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- B. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal from City's Property: Remove waste materials, including materials not allowed for fill, backfill or site grading as specified within, trash, contaminated materials, and debris, and legally dispose of it off City's property at Contractor's expense. All recyclable materials shall be hauled to nearest recycling center and any non-recyclable materials shall be hauled to Denver Arapahoe Disposal Site (DADS). DADS Disposal tickets shall be provided to the Contractor by Project Manager.
- B. Remove any excess fill material from the site, unless otherwise directed by the Project Manager.
- C. Remove any materials determined to be hazardous or contaminated to DADS. DADS Disposal tickets or hazardous waste manifest tickets shall be provided to the Contractor by Project Manager.
- D. Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in work.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Earth Moving.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, excavation, stockpiling, disposing, hauling off, importing fill, re-transporting to fill locations (from locations of excavation or from onsite stockpiles), watering, compaction, sub-grade preparation, measuring of subgrade to bring within tolerances, backfilling, dust control, erosion and sediment control, rough grading, fine grading, as required in accordance with the Contract Drawings and Specifications. Importing of topsoil shall be paid for separately under Division 32 Section "Topsoil".

END OF SECTION 31 20 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing, hauling, and applying water required for compaction of embankments, backfills, sub-grade, and for landscaping, dust control, and other construction operations.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 31 Section "Earth Moving".
 - 3. Division 31 Section "Excavation and Backfilling of Trenches.
 - 4. Division 32 Section "Aggregate Base Course".
 - 5. Division 32 Section "Sodding".

PART 2 - PRODUCTS**2.1 WATER**

- A. If water supply is from a hydrant, the Contractor shall supply a Denver Water approved and calibrated water meter to measure water usage and be responsible to pay all costs related to water usage. The cost of water shall be charged at the current City and County of Denver rate through Denver Water.
- B. Water applied for moisture density control, pre-wetting, and as dust palliative shall be free of debris, organic matter, and other objectionable substances.
- C. Water for landscaping shall be free from oils, acids, salts or any substance that may be harmful to plant life. Non-potable water may be accepted on a case-by-case basis as approved by Project Manager.
- D. When the water source proposed for use by the Contractor is not known, the Contractor shall provide an analysis of water samples from an approved testing laboratory. The analysis shall be provided to the Project Manager prior to use.

PART 3 - EXECUTION**3.1 WATER TRUCK**

- A. At least one water truck shall be on site or as directed by Project Manager.

1. Truck shall have capacity of at least one-thousand (1,000) gallons, or be of adequate size related to the scope of work or as directed by the Project Manager.
2. Water is to be metered for measurement, the Contractor shall provide and use an approved Denver Water metering device.
3. Monthly water usage readings either from the vehicle or from a meter are to be provided to the Project Manager

3.2 APPLICATION

- A. Pressure type distributors or a pipeline equipped with sprinkler system.
- B. Moisture and Density Control: Ensure a uniform and controlled application of water without ponding or causing erosion for optimum moisture content.
- C. Pre-wetting: Pre-wetting material in excavation areas prior to removal for placement in embankments will be allowed as approved by the Project Manager. Prior to excavation the Contractor shall drill, bore or dig test holes to the full depth of excavation to determine moisture requirements. The contractor will identify and confirm with the Project Manager the areas for pre-wetting, including equipment to be used for the pre-wetting operations.
- D. Landscape Watering: None required.
- E. If overwatering occurs during any of the above operations, de-water at no additional expense to the City.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Watering will not be measured but shall be considered as a subsidiary obligation of the lump sum bid item for earth moving.

4.2 PAYMENT

- A. Watering shall not be paid for separately.

END OF SECTION 31 32 50

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for the following:
 - 1. Existing sub grade material excavation, exposed sub grade surface loosening, shaping, conditioning and compaction, aggregate base course placement and compaction, asphalt pavement placement and compaction, concrete wheel stop installation and pavement marking paint.
- B. Related Sections:
 - 1. Division 01 Section "Layout of Work and Surveys".
 - 2. Division 01 Section "Contractor Quality Control".
 - 3. Division 01 Section "Erosion and Sedimentation Control".
 - 4. Division 01 Section "Material and Equipment".
 - 5. Division 31 Section "Earth Moving".
 - 6. Division 32 Section "Concrete Walks, Curbs and Miscellaneous Flatwork".

1.3 REFERENCES

- A. Plant mix pavements for this project shall be done in accordance the Metropolitan Government Pavement Engineers Council (MGPEC) Specification Item 20 for Hot Mix Asphalt Pavement (HMA) and Stone Matrix Asphalt (SMA). The latest issue is available from www.Mgpec.org.
- B. The MGPEC specifications to be used for this project are written as a stand-alone document. Included with the specifications Item 20 for mix identifying Asphalt Mixture criteria (grading, binder, %RAP and design level).

1.4 SUBMITTALS

- A. See Division 01 Section "Submittals" for submittal requirements.
- B. Mix Designs: Submit substantiating data for each Asphalt mix design specified for use to the Project Manager not less than four (4) weeks prior to first Asphalt placement. Data for each mix shall, as a minimum, include the following:
 - 1. Mix identification designation (unique for each mix submitted).
 - 2. Statement of intended use for each mix.
 - 3. Mix proportions.
- C. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
- D. Samples: For each paving fabric none required.

- E. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. None required.

1.5 QUALITY CONTROL

- A. Installer Qualifications: Submit supportive documentation as to the asphalt installer's qualifications relative to training and experience for installation of asphalt required for this Project. Installer to have been in business in the State of Colorado continuously for a minimum of five (5) years, and can prove experience on completed jobs of similar scope and complexity.
- B. Preinstallation Conference: Conduct conference at Project Site.
 - 1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
 - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
 - b. Review condition of subgrade and preparatory work.
 - c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
 - d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- C. Quality Control: The Contractor is responsible for Quality Control Testing, including workmanship and materials furnished by his subcontractors and suppliers.
 - 1. Per MGPEC requirements.
 - 2. Inspection or testing does not relieve the Contractor of his responsibility to perform the Work in accordance with the Contract Documents.
 - 3. Contractor is responsible for proof rolling and or testing of all sub-grade prior to placement of Aggregate Base Course. The Contractor shall verbally or in writing inform the Project Manager the day of any failed or passed tests.
 - 4. The Project Manager shall be notified a minimum of forty-eight (48) hours prior to the dates of asphalt placement and testing.
 - 5. Contractor shall provide written test results within forty-eight (48) hours of receiving results from testing agency.
 - 6. Should a test result come back as failed, the Contractor is responsible for removal, disposal and replacement of failed sections until specifications have been met. This work shall be completed at no additional cost to the City.
 - 7. City reserves the right to provide Quality Assurance testing at any time during the project.
- D. Testing:
 - 1. Contractor is responsible for providing Quality Control testing through a third party testing agency. The third party testing agency will provide testing at random locations and times as directed by the Project Manager to insure that quality Control standards are being achieved.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Prime Coat: Minimum surface temperature of sixty (60) deg F.
 - 2. Tack Coat: Minimum surface temperature of sixty (60) deg F.
 - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 - 4. Asphalt Base Course: Minimum surface temperature of forty (40) deg F and rising at time of placement.
 - 5. Asphalt Surface Course: Minimum surface temperature of sixty (60) deg F at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of forty (40) deg F for oil-based materials fifty five (55) deg F for water-based materials, and not exceeding ninety-five (95) deg F.

PART 2 - PRODUCTS

2.1 ASPHALT MIX: Refer to MGPEC Specification: The latest issue is available from www.Mgpec.org.

- A. Item 7- Aggregate Base Course
- B. Item 20-Hot Mix Asphalt Pavement (HMA) and Stone Matrix Asphalt (SMA).
- C. Item 22- Paving Fabric

2.2 PAVEMENT MARKING PAINT AND ASSOCIATED MATERIALS

- A. Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, colors complying with FS TT-P-1952.
 - 1. Color: White and blue.
- B. Pavement-Marking Paint: MPI #32 Alkyd Traffic Marking Paint.
 - 1. Color: White and blue.

2.3 AUXILLIARY MATERIALS

- A. Glass Beads: AASHTO M 247, Type 1.

- B. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2-inches high by nine-inches (9") wide by seventy-two (72")-inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.
 - 1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.
- C. PREFORMED TRAFFIC-CALMING DEVICES
 - 1. None required.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired 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 fifteen (15) tons.
 - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Project Manager, and replace with compacted backfill or fill as directed.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.
- D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 REFERENCE STANDARD: Refer to MGPEC Specification. The latest issue is available from www.Mgpec.org.

- A. Item 5- Stabilized Subgrade
- B. Item 7- Aggregate Base Course
- C. Item 20-Hot Mix Asphalt Pavement (HMA) and Stone Matrix Asphalt (SMA).
- D. Item 22- Paving Fabric
- E. Items 13A through 19 pertaining to cutting, sealing and patching.

3.3 QUALITY CONTROL

- A. Record of Work: Contractor to keep a record listing the time and date of placement of all asphalt materials. Such record shall be kept until the completion of the project and shall be available to the Project Manager for examination at any time. A copy of the record shall be kept and included as part of the O&M manuals at project closeout.

- B. **Manufacturer Qualifications:** Submit supportive documentation as to the paving mix manufacturer's qualifications, registered with and approved by Project Manager. Manufacturer is to have been in business in the State of Colorado continuously for a minimum of five (5) years.
- C. **Installer Qualifications:** Submit supportive documentation as to the asphalt installer's qualifications relative to training and experience for installation of asphalt required for this Project. Installer to have been in business in the State of Colorado continuously for a minimum of 5 years, and can prove experience on completed jobs of similar scope and complexity.
- D. **Regulatory Requirements:** Comply with materials, workmanship, and other applicable requirements of Denver Department of Public Works for asphalt paving work.
 - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

3.4 ASPHALT PAVEMENTS

- A. Pavement sections shall be installed in accordance to the project geotechnical report and MGPEC, following the more stringent of the two sources.
 - 1. **Parking Lot Asphalt Pavement:**
 - a. Existing sub-grade shall be reconditioned to a minimum depth of 8-inches or as required per the geotechnical data, whichever is greater. The sub-grade shall be moisture conditioned and compacted to ninety-five percent (95%) of Standard Proctor for ABC.
 - b. Base course shall be a minimum six-inch (6") thickness, moisture conditioned and compacted to ninety-five percent (95%) of Standard Proctor in accordance with MGPEC Item 7.
 - c. Parking areas shall have a minimum asphalt thickness of five inches (5").
 - d. Total thickness of pavement section is eleven-inches (11").
 - 2. **Main drive isles Asphalt Pavement:**
 - a. None required.
 - 3. **Pedestrian Walk Asphalt Pavement:**
 - a. None required.

3.5 PATCHING AND REPAIRS

- A. Refer to MGPEC Items 19, 23, and 27.

3.6 SURFACE PREPARATION

- A. Refer to MGPEC Item 20.

3.7 PAVING GEOTEXTILE INSTALLATION

- A. None required.

3.8 ASPHALT TRAFFIC-CALMING DEVICES

- A. None required.

3.9 SURFACE TREATMENTS

- A. Fog Seal: Refer to MGPEC Item 24.
- B. Chip Seal: Refer to MGPEC Item 25.
- C. Slurry Seals: Refer to MGPEC Item 26.

3.10 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Project Manager.
- B. Allow paving to age for 30 days 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 fifteen (15) mils.
 - 1. Broadcast glass beads uniformly into wet pavement markings at a rate of six (6) lb/gal.

3.11 WHEEL STOPS

- A. Install wheel stops in bed of adhesive as recommended by manufacturer.
- B. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.12 PREFORMED TRAFFIC-CALMING DEVICES

- A. None required

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Asphalt Pavement.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, excavation, sub-grade preparation, base course placement, asphalt compaction, wheel stop installation and pavement marking, testing, stockpiling, disposing, hauling off, watering, dust control, erosion and sediment control, as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 32 12 16

SECTION 32 13 13 CONCRETE WALKS, CURBS, AND MISCELLANEOUS FLATWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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 requirements for furnishing, placing, shoring, bracing, and anchorage of formwork, concrete reinforcement, accessories, and placing concrete flatwork, including walks, curbs and gutters, ramps, and pans, perimeter mow strip, bench pads and trash receptacle pads including installation of control and expansion joints, concrete curing and concrete finishing, as well as supply and placement of aggregate base course.
- B. Related Sections:
 - 1. Division 01 Section "Layout of Work and Surveys".
 - 2. Division 01 Section "Submittals".
 - 3. Division 01 Section "Contractor Quality Control".
 - 4. Division 01 Section "Erosion and Sedimentation Control".
 - 5. Division 03 Section "Cast-In-Place Concrete".
 - 6. Division 31 Section "Earth Moving".

1.3 REFERENCES

- A. Project Geotechnical Report: Ground Engineering Consultants Inc. Subsurface Exploration Testing and Report March 26, 2008.
- B. Note: All references below shall be from the most current edition.
- C. American Concrete Institute (ACI):
 - 1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
 - 2. ACI 301 - Specifications of Structural Concrete for Buildings.
 - 3. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
 - 4. ACI 305 and 306 - Hot and Cold Weather Protection for Concrete.
 - 5. ACI 315 - Details and Detailing of Concrete Reinforcement.
 - 6. ACI 318 - Building Code Requirements for Reinforced Concrete.
 - 7. ACI 347 - Recommended Practice for Concrete Formwork.
- D. American Society for Testing and Materials (ASTM):
 - 1. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
 - 2. ASTM C33 - Concrete Aggregates.
 - 3. ASTM C94 - Ready-Mixed Concrete.
 - 4. ASTM C150 - Portland Cement.
 - 5. ASTM C260 - Air Entraining Admixtures for Concrete.
 - 6. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

7. ASTM C494 - Water Reducing Admixtures for Concrete.
8. ASTM C618 - Fly Ash Mineral Admixture for Concrete.
9. ASTM C672 - Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
10. ASTM-C800 - Curing Compound, Concrete, for New and Existing Surfaces.

E. CRSI - Manual of Standard Practice.

F. Colorado Department of Transportation (CDOT) – Standard Specifications for Road and Bridge Construction, latest edition

G. NRMCA: National Ready Mixed Concrete Association

1.4 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.

B. Definitions: Refer to ACI 301 11.7 for definition of slab surface finishes.

1.5 QUALITY CONTROL

A. Reference Standards: Comply with following standards except where more stringent requirements are shown or specified:

1. American Concrete Institute (ACI) Publications: Comply with the following unless modified by requirements in the Contract Drawings. Note: All references below shall be from the most current edition.
 - a. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
 - b. ACI 301 - Specifications of Structural Concrete for Buildings.
 - c. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
 - d. ACI 305 and 306 - Hot and Cold Weather Protection for Concrete.
 - e. ACI 315 - Details and Detailing of Concrete Reinforcement.
 - f. ACI 318 - Building Code Requirements for Reinforced Concrete.
 - g. ACI 347 - Recommended Practice for Concrete Formwork.
 - h. ANSI/ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
 - i. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
 - j. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 - k. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
 - l. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
 - m. ASTM C33 - Concrete Aggregates.
 - n. ASTM C94 - Ready-Mixed Concrete.
 - o. ASTM C150 - Portland Cement.
 - p. ASTM C260 - Air Entraining Admixtures for Concrete.
 - q. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
 - r. ASTM C494 - Water Reducing Admixtures for Concrete.
 - s. ASTM C618 - Fly Ash Mineral Admixture for Concrete.
 - t. ASTM C672 - Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
2. ASTM-C800 - Curing Compound, Concrete, for New and Existing Surfaces.
3. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

- B. Pre-Construction Conference: Conduct conference at location approved by Project Manager.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Special concrete finish subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.
- C. Testing: Refer to Part 3 QUALITY CONTROL for Contractor's testing requirements.

1.6 SUBMITTALS

- A. See Division 01 Section "Submittals" for submittal requirements.
- B. Product Data: For each type of product indicated.
- C. Material Certificates: For the following, from manufacturer:
 - 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.
- D. Field quality control reports.
- E. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.
- F. Mix Designs:
 - 1. Submit substantiating data for each concrete mix design specified for use to the Project Manager not less than four (4) weeks prior to first concrete placement. Data for each mix shall, as a minimum, include the following per section 2.7.B:
 - a. Mix identification designation (unique for each mix submitted).
 - b. Statement of intended use for mix.
 - c. Mix proportions.
 - d. Aggregates.
 - e. Admixtures (must be approved by the Project Manager)
 - f. Wet and dry unit weight.
 - g. Entrained air content.
 - h. Design slump.

- i. Strength qualification data.

1.7 DELIVERY, STORAGE AND HANDLING

- A. General: Materials handling and batching shall conform to applicable provisions of ASTM C94.
- B. Reinforcing: Unload and store reinforcing bars so they are kept free of mud and damage.
- C. Hauling Time for Concrete: Deliver and discharge all concrete transmitted in a truck mixer, agitator, or other transportation device not later than one and one-half (1-1/2) hours from batch time, or three hundred (300) revolutions of the drum after the initial mixing water has been added, whichever is earliest.
- D. Extra Water:
 - 1. Deliver concrete to site in exact quantities required by design mix.
 - 2. Should extra water be required for workability before depositing concrete, and the water/cement ratio of accepted mix design will not be exceeded, the General Contractor's superintendent shall have the sole authority to authorize addition of water. Additional water shall not exceed one (1) gallon/cu. yd. Any additional water added to mix after leaving batch plant shall be indicated on truck ticket and signed by person responsible.
 - 3. Where extra water is added to concrete it shall be mixed thoroughly for thirty (30) revolutions of drum before depositing.
 - 4. Water may be added at the site only once for each batch.
 - 5. A full set of tests shall be performed after addition of water. Excessive slump or other out of range tests will be cause for rejection.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Cold Weather Placement:
 - a. When for three successive days prior to concrete placement the average daily outdoor temperature drops below forty degrees (40°) F or when the average outdoor temperature is expected to drop below forty degrees (40°) F on the day of concrete placement, preparation, protection and curing of concrete shall comply with ACI 306R. Concrete temperature shall be maintained above fifty degrees (50°) F using concrete blankets or heating.
 - b. Minimum temperature of concrete upon delivery shall conform to ACI 301 Table 7.6.1.1. Concrete at time of placement shall conform to minimum values of ACI 306R Table 1.4.1, and shall not be below minimum temperature of fifty degrees (50°) F.
 - c. Subject to acceptance of the Project Manager an accelerating admixture may be used. Admixtures shall meet requirements of Part 2. Calcium Chloride and other chloride-type accelerating admixtures are not allowed.
 - d. Comply with concrete protection temperature requirements of ACI 306R. Record concrete temperatures during specified protection period at intervals not to exceed sixteen (16) hours and no less than twice during any twenty-four (24) hour period.
 - 2. Hot Weather Placement:
 - a. When depositing concrete in hot weather, follow recommendations of ACI 305R.
 - b. Temperature of concrete at time of placement shall not exceed eighty-five (85°) F.

- c. When air temperatures on day of placement are expected to exceed ninety degrees (90°) F, mix ingredients shall be cooled before mixing. Flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for all or part of mix water.
 - d. Retarding admixture may be used subject to acceptance of the Project Manager. Admixtures shall meet requirements of Part 2.
 - e. Protect to prevent rapid drying. Start finishing and curing as soon as possible.
- B. Protection: Protect newly finished slabs from vandalism and all weather related damage. Protect finished slabs from mortar leakage from pouring of concrete above. Cover masonry walls, glazing, and other finish materials with polyethylene or otherwise protect from damage due to pouring of concrete.
 - C. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
 - D. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of forty degrees (40°) F for oil-based materials, fifty five degrees (55°) F for water-based materials, and not exceeding ninety-five degrees (95°) F.
- 1.9 RIGHT OF WAY WORK
- A. Contractor shall obtain all necessary permits when working with in the Right of Way.
 - B. Contractor shall preserve and protect all permanent land survey control markers. Per the General Contract Conditions Article 319 “Preservation of Permanent land Survey Control Markers”.

PART 2 - PRODUCTS

2.1 SUBGRADE MATERIAL

- B. Dense, readily compactible material, free from organic matter, clay, and loose rock in excess of one and one half-inches (1-1/2”). Material excavated from on-site that meets this requirement may be used if approved by Project Manager. Material properties to be in conformance with project Geotechnical Report.

2.2 FORM MATERIALS

- A. Hand Placed Steel Forms: Hand placed steel forms are only to be used for sections that are straight and have no bend, radii or curvature in the sections to be used.
- B. Plywood Forms: Are to be used on any section of concrete that have bends, radii or curvature. Forms shall be made of Douglas Fir or Spruce species; solid one side grade; sound, undamaged sheets with straight edges. Staking shall be adequate to hold wet concrete while maintaining the desired radii.
- C. Lumber: Douglas Fir or Spruce species; construction grade; with grade stamp clearly visible.

- D. Form Coatings: Provide commercial formulation form coating compounds that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.3 CONCRETE MATERIALS

- A. Provide materials in accordance with ACI 301, unless amended or superseded by requirements of this section or general notes on structural drawings.
 - 1. General: Ready-mixed Concrete: ASTM C94. On-site mixed concrete not allowed.
 - 2. Cement: ASTM C150. Type II minimum of five hundred sixty four (564) pounds per cubic yard.
 - 3. Fly Ash: ASTM C618 Class C or F. Fly ash shall not exceed fifteen percent (15%) of total cementitious material by weight.
 - 4. Aggregate: ASTM C33.
 - a. Obtain from same source throughout project.
 - b. All sand and aggregates to meet C-33 Table 3 for Class 4S "Severe Weathering Region".
 - 1) Fine Aggregate: Clean, natural sand.
 - 2) Coarse Aggregate: Clean gravel or crushed stone.
 - 5. Water: ASTM C 94/C 94M, Clean and not detrimental to concrete.

2.4 STEEL REINFORCEMENT

- A. Recycled Content: Provide steel reinforcement with an average recycled content of steel so postconsumer recycled content plus one-half of preconsumer recycled content is not less than twenty five percent (25%).
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- C. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 (Grade 420) deformed bars.
- D. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars. Cut bars true to length with ends square and free of burrs.
- E. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars.
- F. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- G. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, 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 specified, and as follows:

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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 dielectric-polymer-coated wire bar supports.

I. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

2.5 SLIP "SPEED" DOWELS

A. Slip Joints:

1. Speed Dowel Model PSD09/#4TX, 9" long sleeve to accommodate 18" smooth steel round bar. Manufactured by Sika/Greenstreak, (800)325-9504, or equal.
2. Dowel, 18" long smooth round steel bar, 5/8" diameter. De-bur cut ends.

2.6 ADMIXTURES

A. General: Unless specified, no admixtures may be used without specific approval of the Project Manager.

B. Prohibited Products: Calcium chloride or admixtures containing more than 0.05% chloride ions or thiocyanates are not permitted.

C. Air-Entraining Admixture: ASTM C260. Subject to compliance with requirements, provide one of the following:

1. "Air Mix" by Euclid Chemical Co.
2. "Darex ARA" by W. R. Grace.
3. "Micro-Air" by Master Builders.
4. Or equal.

D. Water Reducing Admixture: ASTM C494, Type A. Subject to compliance with requirements, provide one of the following:

1. "Eucon WR-75" by Euclid Chemical Co.
2. "Rheobuild 1000" by Master Builders.
3. "Plastocrete 106" by Sika Chemical Co.
4. Or equal.

E. High Range Water Reducing Admixture (Superplasticizer): ASTM C494, Type F or G. Subject to compliance with requirements, provide one of the following:

1. "Eucon 37" by Euclid Chemical Co.
2. "Pozzolith 400N" by Master Builders.
3. "Sikament" by Sika Chemical Co.
4. Or equal.

F. Warm weather admixtures: ASTM C494. Use of admixtures will not relax warm weather placement requirements.

G. Cold Weather Admixtures: ASTM C494. Use of admixtures will not relax cold weather placement requirements.

H. Color Admixtures

1. Davis Colors chart or approved equal.

2.7 CONCRETE MIX

- A. Refer to the Denver Right of Way Services approved materials list of pre-approved concrete mixes at the following website:

<https://www.denvergov.org/content/denvergov/en/right-of-way-services/engineering-regulatory-analytics/engineering-plan-review/manuals-regulations.html>

- B. All Concrete mixes from the approved list or submitted for approval shall meet the following criteria.
 1. All concrete for flatwork shall be Class P four-thousand two-hundred (4,200) PSI unless otherwise requested by the Project Manager.
 2. Mix concrete in accordance with ASTM C94 and ACI 301 Chapter 3.
 3. Cement Content: Type II cement, minimum of five hundred sixty-four pounds (564#) per cubic yard.
 4. Maximum water-cement ratio: 0.44.
 5. Slump: Four inches (4") maximum when hand placed.
 6. Air Entrainment: five percent (5%) to eight percent (8%).
 7. Aggregate Size: three quarter-inch (3/4") maximum.
 8. Deliver concrete and discharge all concrete transmitted in a truck mixer, agitator, or other transportation device not later than one and one-half (1-1/2) hours from batch time, or three hundred (300) revolutions of the drum after the initial mixing water has been added, whichever is earliest.
 9. During cold weather below forty-five degrees (45°) F, use heated water and aggregates if necessary to maintain concrete temperature between sixty degrees (60°) F. and ninety degrees (90°) F.
 10. Concrete for Footings, Walls, and Interior Slabs-on-Grade shall be Class B, as approved by the Project Manager.
 11. Concrete for Exterior Flatwork, including Pavement, Curb and Gutter, and Drainage Pans shall be Class P, as approved by the Project Manager.
 12. Fly Ash: Per CDOT Standard Specifications for Road and Bridge Construction Section 701.02.

2.8 FIBROUS CONCRETE REINFORCEMENT

- A. Shall be one hundred percent (100%) virgin polypropylene, fibrillated fibers containing no reprocessed olefin materials and specifically manufactured to an optimum gradation utilizing twenty-five (25) individual fiber designs for use as concrete secondary reinforcement. Volume per cubic yard shall be one and one-half (1.5) pounds, or in accordance with manufacturer's recommendations. Fiber manufacturer must document evidence of five (5) year satisfactory performance history, compliance with applicable building codes and ASTM C1116 Type III 4.1.3 and ASTM C1116 Performance Level I.
 1. Fibrous concrete reinforcement shall be utilized in all flatwork applications.

2.9 EXPANSION JOINT MATERIAL

- A. Interior Use or Exterior Use where sealants are specified: Bituminous saturated fiber conforming to ASTM D1751, one half-inch (1/2") thick. Provide manufacturer's certification of compatibility with specified sealants where required.

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- B. Pre-molded closed cell polyethylene foam: Backer rod if required, equal to “Sonoflex F” by BASF, Provide half-inch (1/2”) thick by depth of the slab material, allow half-inch (1/2”) thickness for joint sealer.
- C. Joint Sealant: Sonolastic Sealant as manufactured by BASF or a silicone material that is on CDOT’s approved silicone sealant list. Where color additive is used, color to match.

2.10 CONTROL JOINTS

- A. Shall be in conformance with current Denver Department of Public Works Traffic Engineering Standards and Details and as shown on Contract Drawings

<https://www.denvergov.org/Portals/730/documents/PW%20TRANS%20STDS%20&%20DETAILS%20-%20FINAL%20MAY%202015.pdf>

2.11 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately nine (9) oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
 - 1. Products: Subject to compliance with requirements:
 - a. BASF Construction Chemicals, LLC; Confilm.
 - b. Or approved equal.
- E. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type two (2), Class B, dissipating.
 - 1. Products: Subject to compliance with requirements:
 - a. Dayton Superior Corporation; Day-Chem White Pigmented Cure (J-10-W).
 - b. Or approved equal.

2.12 RELATED MATERIALS

- A. 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 one eighth-inch (1/8”) to one quarter-inch (1/4”) to match Project Manager’s sample.
 - 1. Products: Subject to compliance with requirements:
 - a. Conspec by Dayton Superior; Delay S.
 - b. Or approved equal.

2.13 TRUNCATED DOME INSERTS FOR RAMPS

- A. Shall be in conformance with current Denver Department of Public Works standards.

PART 3 - EXECUTION

3.1 QUALITY CONTROL

- A. Requirements of Regulatory Agencies: Comply with all applicable provisions of the state and local building and safety codes.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer, unless otherwise approved by Project Manager.
- C. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that 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" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- D. Testing: All testing shall be completed by the Contractor at their expense unless otherwise specified by the contract.
- E. Testing Agency Qualifications: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures. Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- F. Testing Frequency: Obtain at least one composite sample for each one hundred (100) cubic yards, or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five (5) compressive-strength tests for each concrete mixture, testing shall be conducted from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
 - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture. 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 mixture.
 - 4. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one (1) set of four (4) standard cylinder specimens for each composite sample.
 - 5. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at twenty-eight (28) days and keep one for backup in the event a sample should break.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at twenty-eight (28) days.
- G. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than two-hundred (200) psi.

- H. Test results shall be reported in writing to Project Manager, concrete manufacturer, and Contractor within forty eight (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 twenty eight (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7) and twenty eight (28) day tests.
- I. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Project Manager.
- J. Concrete work will be considered defective if it does not pass tests and inspections.
- K. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- L. Prepare test and inspection reports.
- M. Record of Work: A record shall be kept by the Contractor listing the time and date of placement of all concrete for the structure. Such record shall be kept until the completion of the project and shall be available to the Project Manager for examination at any time.
- N. Mockups: If requested by the Project Manager, prior to starting any concrete work, provide a sample panel using materials indicated for project work. For each type, color and finish of concrete specified, build panel at the site of full thickness and approximately ten feet (10') by 10 feet (10'), including expansion joints, control joint, scales, fillers, and one radial edge. Provide the workmanship proposed for the work. Correct and replace sample panel until Project Manager's acceptance of the work. Retain panel(s) during construction as a standard for completed paving work.
 - 1. Build panel approximately one-hundred (100) sq. ft. in the location indicated or, if not indicated, as directed by Project Manager.
 - 2. Approved mockups may become part of the completed Work if approved prior to the construction of the mock up and is undisturbed at time of Substantial Completion.
 - 3. Notify the Project Manager a minimum of seven (7) days in advance of dates and times when mockups will be constructed.
 - 4. Obtain the Project Manager's written approval of the mockups before starting construction.
 - 5. If the Project Manager determines that the mockup does not meet the requirements, demolish and remove from the site and cast another until the mockup is approved.
 - 6. Maintain the mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 7. Demolish and remove mockups when directed by Project Manager.
- O. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.

3.2 PREPARATION OF SUBGRADE

- A. Excavate to required depth in accordance with geotechnical report. Remove soft, yielding material and replace with select fill. Compact to minimum ninety-five percent (95%) Standard Proctor within two percent (2%) of optimum moisture.
- B. Refer to Division 31 Section: Earth Moving for requirements for subgrade testing and proof-rolling.

3.3 MAINTENANCE OF SUBGRADE

- A. Maintain subgrade in a compacted condition until concrete is placed.

3.4 FORMS

- A. Metal, plastic or uniform warp free lumber, coated with form release agent. Slope forms to give slabs positive drainage and stake securely. Obtain approval of Project Manager for alignment and grade of forms a minimum of forty-eight (48) hours prior to placing concrete. Any concrete work installed without obtaining approval from the Project Manager shall be subject to removal and replacement at the discretion of the Project Manager, at no cost to the City.
- B. Radii shall be continuous and flowing to avoid angular intersections in the horizontal alignment, radial forming shall use bender board or approved equal as directed by Project Manager.

3.5 STEEL REINFORCEMENT

- A. Install steel reinforcement only in locations shown on Contract Drawings.
- B. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- C. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- D. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

3.6 CONCRETE PLACEMENT

- A. Prior to placing any new sections of asphalt or concrete pavement, the entire subgrade shall be scarified to a depth of 6-inches. In areas where existing pavement is to be removed and replaced the existing compacted subgrade may be reused if the subgrade meets specified compaction. In areas of existing subgrade that do not meet the specified compaction, materials shall be removed, replaced and compacted to meet the specified proctor density. Adjust moisture content and compact as hereinafter specified.
- B. Before placing concrete, inspect and complete formwork installation, steel reinforcement (if present), and items to be embedded or cast-in.
- C. Do not place concrete on frozen surfaces.

- D. 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.
- E. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- F. Do not add water to concrete during delivery.
- G. Deposit and spread concrete in a continuous operation between transverse joints. Do not use vibratory equipment 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. Screed paving surface with a straightedge and strike off.
- J. 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.
- K. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.
- L. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.
 - 1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.
- M. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
 - 1. When air temperature has fallen to or is expected to fall below forty degrees (40°) F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than fifty degrees (50°) F and not more than eighty degrees (80°) F at point of placement.
 - 2. If subgrade is frozen, as determined by Geotechnical Engineer and/or Project Manager, thaw subgrade to depth of eight (8") prior to placing concrete.
 - 3. Do not use frozen materials or materials containing ice or snow.
 - 4. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- N. 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 ninety degrees (90°) F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in 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 CONCRETE FINISHING

- A. Allow time for bleed water to appear, then scrape or push off all bleed water. Do not work water into surface.
- B. Final level, light bull float, but do not trowel surface.
- C. After darbying or bullfloating, stop finishing until bleeding has ceased and until concrete can support foot pressure with only about one eighth-inch (1/8") indentation. During or after the first floating, check planeness of surface with a ten foot (10') straightedge applied at not less than two different angles, and then cut down all high spots and fill all low spots to achieve a true plane within one eighth-inch (1/8") in ten feet (10').
- D. Finishes:
 1. Medium Broom Finish: Provide a medium broom finish for all exterior concrete unless otherwise noted. Immediately after float finishing and tool work, roughen surface with fiber-bristle broom to match the approved mockup panel. Confirm direction or pattern of broom finish with the Project Manager prior to commencing slab placement.
 2. Monolithic Exposed-Aggregate Finish: Expose coarse aggregate in paving surface as follows:
 - a. Immediately after float finishing, spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
 - b. Cover paving surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
 - c. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
 - d. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.
 3. Seeded Exposed-Aggregate Finish:
 - a. Immediately after initial floating, spread a single layer of aggregate uniformly on paving surface. Tamp aggregate into plastic concrete and float finish to entirely embed aggregate with mortar cover of one sixteenth-inch (1/16").
 - b. Spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
 - c. Cover paving surface with plastic sheeting, sealing laps with tape, and remove sheeting when ready to continue finishing operations.
 - d. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half (1/2) of the diameter of the smallest aggregate.
 - e. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a three eighths-inch (3/8") radius. Final concrete finish to completed following jointing. Surface/edging tool marks are not acceptable.
- F. Accessible Ramps:
 - 1. Provide score joints in handicap ramps, tooled in a pattern in accordance with standard Denver Public Works standards.
 - 2. Install truncated dome inserts flush with the adjacent ramp surface in accordance with standard Denver Public Works standards, taking care to achieve a tight bond with the concrete, free of air pockets.
 - 3. Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.
- G. Do not use evaporative retarders as finishing aid.

3.8 CONCRETE CURING, PROTECTION AND SURFACE TREATMENTS

- A. Refer to the list of curing materials in PART 2 - MATERIALS. Apply curing materials as specified by the manufacturer.
- B. General:
 - 1. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Maintain concrete with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of concrete.
 - 2. Curing shall commence as soon as free water has disappeared from the concrete surface after placing and finishing. The curing period shall be seven days for all concrete unless test cylinders, made and kept adjacent to the structure and cured by the same methods, are tested with the average compressive strength equal to seventy percent (70%) of the specified twenty-eight (28) day strength.
 - 3. Curing shall be in accordance with ACI 301 procedures. Avoid rapid drying at the end of the curing period. During hot and cold weather, cure concrete in accordance with ACI 305R and ACI 306R.
- C. Curing Methods: Perform curing of concrete by moisture curing, by moisture-retaining cover curing, by curing compound, and by combinations thereof, as herein specified. Coordinate with and choose a curing method that is compatible with the requirements for subsequent material usage on the concrete surface.
 - 1. Provide moisture curing by one of the following methods:
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Continuous water-fog spray.
 - c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping it continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
 - 2. Provide moisture retaining cover curing as follows: Cover concrete surfaces with a moisture-retaining cover for curing concrete, placed in widest practical width with sides and ends lapped at least 3-inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Provide curing and sealing compound to exterior slabs, walks, curbs, etcetera as follows:
 - a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within thirty (30) minutes). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to rainfall within three hours after initial application.
 - b. Maintain continuity of coating and repair damage during period.
- D. Curing Formed Surfaces: Where wooden forms are used, cure formed concrete surfaces by moist curing with forms in place for full curing period or until forms are removed. When forms are removed, continue curing by methods specified above for specified curing time.

3.9 JOINTS

- A. Construct joints true to line with faces perpendicular to surface.
- B. Expansion Joints: Expansion joint material shall be provided at the following locations and shall be in place prior to the placing of concrete:
 1. As shown on the Contract Drawings; or
 2. At each end of curb return.
 3. Between sidewalk and driveway slabs or service walks.
 4. Between new concrete and existing concrete.
 5. Between new concrete and fixed vertical objects.
 6. At maximum one hundred twenty foot (120') spacing.
 7. As directed by Project Manager.
 8. Thoroughly clean all surfaces prior to installation of sealant material.
- C. Speed Dowels:
 1. Attach bases to the face of concrete forms using a double-headed nail or self-tapping screw.
 2. Center of base shall be centered on form.
 3. Prior to pouring concrete, Speed Dowel sleeve shall be slipped over base.
 4. Pour concrete minimum eighteen-inches (18") from Speed Dowel system and work concrete around the Speed Dowel System.
 5. Concrete forms shall be removed with bases still attached. Bases may be reused.
 6. Install slip dowels to the full depth of the embedded Speed Dowel sleeve and proceed with next concrete pour.
 7. Greasing of dowels is not required. Embedded Speed Dowel Sleeve accommodates expansion and shrinkage movements that may occur.
 8. Bent or badly sheared slip dowels shall not be used. Saw cut dowels recommended.
 9. Concrete shall not be poured directly over the Speed Dowel System.
 10. Place edge forms plumb. Out of plumb forms may result in misaligned dowels.
- D. Contraction (Control) Joints in Walks: Contraction joints shall be formed with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut one eighth-inch (1/8") wide joints into concrete that has hardened sufficiently that cutting action will not tear, abrade, or otherwise damage surface, but before development of random contraction cracks. Saw cut joints shall be spaced at a distance equal to the width of the walk, but not over ten feet (10') unless approved by the Project Manager. Depth of joints shall be one-fourth (1/4) the slab thickness.

1. Tooled joints will not be allowed on concrete trails, unless directed by the Project Manager.

E. Curb and Gutter Contraction (Control) Joints: Space curb and gutter joints not more than twelve foot six-inches (12'-6") on center, and align them with sidewalk joints. Contraction joints shall be tooled. Form plane of weakness by inserting and later removing a metal divider, finish with an edger or groover, or by saw cutting a previously tooled joint.

3.10 FORM REMOVAL

A. Remove forms after concrete surface is hard enough so as not to be damaged in any way. Reasonable care is to be used in removing forms. Repair minor defects with high strength grout as per Project Managers direction. Plastering will not be permitted on exposed faces.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Project Manager.

B. Drill test cores, where directed by Project Manager, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

3.12 PAVING TOLERANCES

A. Comply with tolerances in ACI 117, the drawings, and as follows:

1. Elevation: In conformance with grading plans.
2. Thickness: Plus three eighths-inch (3/8"), minus one quarter-inch (1/4").
3. Surface: Gap below ten foot (10') long, unlevelled straightedge not to exceed one eighty - inch (1/8").
4. Lateral Alignment and Spacing of Dowels: one-inch (1").
5. Vertical Alignment of Dowels: one quarter-inch (1/4").
6. Joint Spacing: three-inches (3").
7. Contraction Joint Depth: Plus one quarter-inch (1/4"), no minus.
8. Joint Width: Plus one eighth-inch (1/8"), no minus.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement will be based on the percentage complete for the lump sum contract amount for Concrete Walks, Curbs and Miscellaneous Flatwork.

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4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, excavation, stockpiling, disposing, hauling off, watering, dust control, erosion and sediment control, compaction, sub-grade preparation, formwork, placing of concrete, reinforcing, joints, curing, finishing, placement of CDOT Class 6 aggregate base course under all pavement sections and all other items required to complete the work as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 32 13 13

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for the installation of an underground irrigation system including the following:
 - 1. Trenching, stockpiling excavation materials, refilling and compacting trenches.
 - 2. Existing irrigation system modification limited to lateral piping, fittings and heads.
 - 3. Replacement of unsatisfactory materials.
 - 4. Cleanup, inspections, and approval.
 - 5. Testing.
- B. Related Sections:
 - 1. Division 01 Section "Contractor Quality Control".
 - 2. Division 01 Section "Erosion and Sedimentation Control".
 - 3. Division 31 Section "Earth Moving"
 - 4. Division 32 Section "Concrete Walks, Curbs, and Miscellaneous Flatwork".
 - 5. Division 32 Section "Soil Preparation".
 - 6. Division 32 Section "Topsoil".
 - 7. Division 32 Section "Sodding".

1.3 REFERENCES

- A. Conform to requirements of reference information listed below except where more stringent requirements are shown or specified in Contract Documents.
 - 1. American Society for Testing and Materials (ASTM) - Specifications and Test Methods specifically referenced in this Section.
 - 2. Underwriters Laboratories (UL) - UL Wires and Cables.
 - 3. National Sanitation Foundation (NSF) – Piping and backflow prevention.
 - 4. American Water Works Association – Piping and backflow prevention.

1.4 QUALITY CONTROL

- A. Special Requirements.
 - 1. Tolerances: Specified depths of mains and laterals and pitch of pipes shall be installed per the Contract Drawings and specifications.
 - 2. Compaction: Settlement of trenches is cause for removal of finish grade treatment, refilling, compaction, and repair of finish grade treatment.
 - 3. Coordination with Other Contractors: Protect, maintain, and coordinate work with work under other Sections.
 - 4. Damage to other Improvements: Contractor shall replace or repair damage to grading, soil preparation, seeding, sodding, planting and/or new site features done under other

Sections during Work associated with installation of irrigation system at no additional cost to the City.

5. Damage or Disturbance to the Existing Irrigation Components: Damage to existing components as a result of work being performed by the Contractor will require the Contractor to replace the damaged components to the City's current standards, at no additional cost to the City. This includes boxes, manifolds, valves, angle valves, risers, wire, heads, pipe, and autom.
6. Water Delivery Interruption: When working on an existing irrigation system, the Irrigation Contractor shall contact the Project Manager and inform him seventy-two (72) hours in advance of any water interruption that is required. The maximum irrigation system interruption is to be no more than seventy-two (72) hours during the growing season. The contractor shall make all necessary provisions including material, equipment, labor, delivery and scheduling as required to complete all points of connection, upgrades, and improvements within seventy-two (72) hours.
7. Watering: The Contractor is responsible for following all Denver Water rules and regulations for sod and seed establishment, available at <http://www.denverwater.org>. The Contractor shall post signage per Denver Water in a visible location(s) on site indicating "IRRIGATION TESTING AND MAINTENANCE IN PROGRESS" when Work (establishment, construction or warranty) requires irrigation system operation between the hours of 10 AM to 6 PM. The signs to be used are available from Denver Water.
8. Refer to maintenance requirements for water during construction, 1.9.B.1.

B. Pre-Construction Conferences and Site Meetings:

1. Contractor shall schedule and conduct a pre-construction conference to review in detail quality control and construction requirements for equipment and materials used to perform the Work. Conference shall be scheduled not less than ten (10)-days prior to commencement of Work. All parties required to be in attendance shall be notified no later than seven (7) days prior to date of conference. Contractor shall notify qualified representatives of each party concerned with that portion of Work to attend conference, including but not limited to the Project Manager, Denver Parks Superintendent, Operations Supervisor, Water Conservation, Contractor's Superintendent, and Installer.
2. Prior to commencement of Work, Contractor shall schedule an on-site conference with Project Manager, Denver Forestry and any other parties designated by Project Manager to discuss tree protection requirements, marshalling locations, traffic control, and equipment access. Provide a minimum of seven (7) days notice prior to date of conference.
3. Contractor shall schedule on-site conferences the frequency of which is to be determined by the Project Manager and any other parties designated by the Project Manager to review project progress.
4. Contractor shall record Minutes of each conference and distribute to all parties in attendance within three (3) days of conference.

1.5 FIELD QUALITY CONTROL

- A. Flushing: After piping, risers, and valves are in place and connected, but prior to installation of sprinkler heads, quick coupler assemblies, and hose valves, thoroughly flush piping system under full head of water pressure from dead end fittings. Maintain flushing for five (5) minutes through furthest valves. Cap risers after flushing.
- B. Walk-Through for Substantial Completion:
 1. Arrange for the Project Manager to be present. Provide minimum of forty eight (48) hours notice in advance of walk-through.

2. Entire system shall be completely installed and operational and trenches shall be finish graded and sod and seed in place prior to scheduling of walk-through.
3. Electrically operate each zone in its entirety for the Project Manager at the time of walk-through.
4. A project inspection walk through shall include but is not limited to the following:
 - a. Contractor shall adjust, straighten and nozzle all heads prior to walk through. Review operation, coverage, head/nozzle adjustment, and system adjustment per specifications.
 - b. Confirm irrigation heads are at specified elevation and distance(s) from paved surfaces and curbs, plumb and soil compacted.
 - c. Review trench and related excavation repair including backfill, compaction, fine grade, seed and sod installation.
 - d. Generate a punch list of items to be corrected prior to Final Completion.
 - e. Furnish all materials and perform all work required to correct all inadequacies of coverage due to deviations from Contract Documents.

C. Walk-Through for Final Completion:

1. Arrange for Park Operations Supervisor, the Project Manager and Consultant to be present a minimum of seventy-two (72) hours in advance of walk-through.
2. Show evidence to the Project Manager that the City has received all maintenance items and accessories, charts, record Contract Drawings, equipment, before Final Completion walk-through is scheduled.
3. Operate each zone, in its entirety for the Project Manager at time of walk-through to insure correction of all incomplete items.
4. Items deemed not acceptable by the Project Manager shall be reworked to complete satisfaction of the Project Manager.
5. If after the walk-through for Final Completion of irrigation system the Project Manager finds items which have not been properly adjusted, reworked, or replaced per the previous punch list, the Contractor shall be charged for all subsequent walk-throughs. Funds will be withheld from final payment and/or retainage to Contractor, in amount equal to additional time and expenses required to conduct and document additional walk-throughs by Project Manager to ensure compliance with Contract Documents.

1.6 SUBMITTALS

- A. Prepare and make submittals in accordance with conditions of the Contract prior to installation of any irrigation equipment:
- B. Material List: Submit a PDF file of complete list of materials, and cut sheets indicating manufacturer, model number and description of all materials and equipment to be used. Show appropriate dimensions and adequate detail to accurately portray intent of construction.
- C. Shop Contract Drawings: If applicable, submit shop Contract Drawings for pumps, backflows and assemblies. Include plumbing and foundation/support systems if the installation differs from the manufacturer's recommended installation.
- D. Mock Ups:
 1. Swing joints: Provide a pre-manufactured or constructed swing joint assembly for each detail shown (eg. - quick coupler, rotors) or as directed by the Project Manager
 2. Other: Mock ups that may be requested by the Project Manager.

- E. Operation and Maintenance Manual: None required.
- F. Warranty: Submit in accordance with General Project conditions.

1.7 CONTRACT RECORD DRAWINGS

- A. Prior to the installation of irrigation system, the Contractor will provide on-site copies of original irrigation design Contract Drawings "Record Contract Drawings". Contractor to revise Record Contract Drawings in red ink as Work progresses to show any changes to the plan and include field dimensions. Record Contract Drawings shall be brought up-to-date prior to any Pay Application Submittals that contain irrigation installation. Should the Contractor choose to utilize GPS for the purposes of documenting Work in progress, a hard copy print will need to be provided prior to Pay Application Submittal. A print of Record Contract Drawings shall be available at Project Site for review by the Project Manager at any time during the project.
- B. Record Contract Drawings shall encompass entire scope of work including any altered existing equipment and altered zones, and notate the Automatic Irrigation Controller zone number, type of irrigation, GPM, operating PSI for any altered or added zone.
- C. Preparation of Contract Record Drawings: Dimension from two permanent points of reference (building corners, sidewalk, road intersections or permanent structures) the location of the following items:
 - 1. Point of connection.
 - 2. Routing of non-pressure lateral lines, layout and size.
 - 3. Other related equipment as directed.
- D. Make dimensions accurately at the same scale used in the original Contract Drawings, or larger. Notes and dimension lettering must be legible.
- E. The irrigation legend must be changed to accurately reflect the irrigation equipment installed, if such equipment is not the same as originally specified on the contract documents. This includes flow rates, effective spray diameter/radius and operating pressure of all sprinkler heads.
- F. The Project Manager will not certify any pay request submitted by the Contractor if the Contract Record Drawings are not current, and processing of pay request will not occur until Contract Record Drawings are updated.
- G. Final Submittal: Upon completion of Project, prior to final acceptance, secure digital copy of irrigation design from the Project Manager and record installation information that reflects all changes made over the course of the construction project, prepared by a qualified draftsperson. Contract Record Drawings shall include details, including any revisions as per actual installation. Deliver and submit to the Project Manager for review the following items:
 - 1. Digital Contract Record Drawings in both PDF and AutoCAD release 2007 bound format (include any related X-ref files, plot files and pen settings.) Make any additional changes to the file as directed by the Project Manager prior to final submittal and approval.
- H. Request for final payment will not be certified or processed until all Contract Record Drawing prints and digital files have been received and approved.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Deliver all components to job site in original unopened packaging containers prominently displaying manufacturer's name, volume, quantity, contents, instructions, and conformance to local, state, and federal law. Remove and replace cracked, broken, or contaminated items or elements prematurely exposed to moisture, inclement weather, snow, ice, temperature extremes, fire, or jobsite damage.
- B. Storage and Protection: Deliver, unload, store, and handle materials, packaging and bundling products in dry, weatherproof condition in manner to prevent damage, breakage, deterioration, intrusion, ignition, and vandalism.
- C. Only materials and equipment meeting project specifications and to be used as part of Project shall be stored on site. Project Manager may verify at any time during construction period.

1.9 JOBSITE CONDITIONS

- A. Existing Conditions:
 - 1. Soil Conditions: The Contractor is responsible for investigating the type of soil and conditions in which lines are to be installed. No extra payment will be allowed due to difficulty in trenching, unless approved by the Project Manager.
 - 2. Contractor is responsible for understanding the scope of related operations as specified and indicated in the Contract Drawings and Specifications before beginning Work under this Section.
 - 3. Report unsatisfactory conditions in writing to the Project Manager within twenty-four (24) hours of discovery. Commencement of installation means acceptance of existing conditions by the Contractor.
- B. Protection of Property:
 - 1. Protect buildings, walks, walls, and other property from damage. Erect and maintain barricades, warning signs and lights, and provide guards as necessary or required to protect all persons on the site. Damage caused to asphalt, concrete, monuments, structures or other building material surfaces shall be repaired or replaced at no cost to the City. Restore disturbed areas to original condition.
 - 2. The Contractor is responsible for potholing of all existing utilities, irrigation lines or any other underground improvements that may be damaged due to the installation of Irrigation Systems.
- C. Protection of Existing Trees:
 - 1. None required.
- D. Protection and Repair of Underground Lines:
 - 1. Request utility locates seventy-two (72) hours in advance of any excavations by calling the Utility Notification Center of Colorado at 811. Take whatever precautions are necessary, including pot holing to verify location and depth to protect these underground lines from damage. If damage does occur, all damage shall be repaired by the Utility Owner. All costs of such repairs shall be paid by Contractor.
 - 2. The Contractor is required to contact all private utility companies including Denver City Departments to locate all private utilities. The request for locates shall be a minimum of seventy two (72) hours prior to proceeding with any excavation. If, after such requests

private utilities are encountered and damaged by the Contractor these shall be repaired at no cost to the City. If the Contractor damages staked or located private utilities, they shall be repaired by the Utility Owner at the Contractor's expense.

- E. Replacement of Paving and Curbs: Any damage do to work that occurs adjacent to or crosses existing roadways, paths, trails, curbing, sidewalks, etc. shall be restored to original condition at the contractors expense, and the satisfaction of the Project Manager.

1.10 WARRANTY/GUARANTY

- A. Provide written warranty for material and installation in conformance with General Conditions.
- B. Expenses due to vandalism before Final Acceptance shall be the Contractor's responsibility.
- C. Any settling of backfilled trenches that occurs during warranty period shall be repaired at no expense to the City, including complete restoration of damaged property.
- D. Once final acceptance is granted, the City will maintain turf and planting areas during warranty period, unless maintenance by Contractor is specified in the contract. Contractor is responsible to monitor and coordinate Automatic Irrigation Controller scheduling and maintenance with Project Manager for any seeding, sodding or planting areas under Contractor's warranty.
- E. Project Manager reserves the right for his staff to make temporary repairs during the warranty period as necessary to keep systems in operating condition without voiding the Contractor's warranty, nor relieving the Contractor of his responsibilities.
- F. Contractor shall make repairs and replacements within three days of notification. If Contractor fails to make repairs within three days, the City will make such repairs at Contractor's expense.

1.11 TURN OVER ITEMS

- A. Where applicable, furnish the following maintenance items to City prior to Final Acceptance:
 1. Two (2) sprinkler heads for each size and type specified.
 2. Two (2) nozzles for each type of head.
 3. Two (2) head adjustment tools for each type of head installed.

1.12 MAINTENANCE DURING PROJECT CONSTRUCTION

- A. Within Limits of Construction: Contractor shall fence, water, and keep weed free any turf, trees and any plantings within the limits of construction. Contractor is responsible for maintenance which includes picking up trash, weed control and mowing of turf and native areas within the limits of construction. Contractor is responsible for watering existing landscape within limits of construction. Turf and plants affected by mainline work or irrigation water service shutdown during irrigation season shall receive watering per Parks' schedule, with no interruption of watering greater than seventy-two (72)-hours. Contractor is responsible for maintenance until final acceptance is granted.
- B. Outside Limits of Construction: Coordinate Automatic Irrigation Controller scheduling and maintenance operations with Project Manager for portions of City property unaffected by construction.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Equipment must have performance characteristics to operate per the design conditions indicated. If any discrepancy or conflict exists between the quantities of equipment listed in the schedule and quantities shown on the Contract Drawings, the greater quantity shall govern.
- B. All material shall be of the highest grade possible and where applicable, shall be marked accordingly and shall be new.

2.2 PIPE AND PIPE FITTINGS

- A. Ductile Iron Pipe and Fittings:
 - 1. Ductile Iron Pipe: None required.
- B. Copper Pipe and Fittings:
 - 1. Pipe: None required.
 - 2. Fittings: None required.
- C. Main and Lateral Lines:
 - 1. Main Lines: None required.
 - 2. Lateral Lines: One hundred (100) PSI High Density NSF Polyethylene Piping – one inch (1”) minimum diameter.
 - a. Velocity of water flow in polyethylene pipe shall not exceed seven and one half (7-1/2) feet per second.
- D. Sleeving:
 - 1. None required.
- E. Brass Pipe and Fittings:
 - 1. Brass Pipe: None required.
 - 2. Fittings: None required.
- F. Plastic Pipe and Fittings:
 - 1. Identification Markings: Identify all pipe with following indelible markings:
 - a. Manufacturer's name.
 - b. Nominal pipe size.
 - c. Schedule of class.
 - d. Pressure rating.
 - e. NSF (National Sanitation Foundation) seal of approval.
 - f. Date of extrusion.
 - 2. Class 200 PVC Pipe:
 - a. None required.
 - 3. Gasketed End Pipe:
 - a. None required.
 - 4. Flexible Plastic Pipe (non-pressure lateral lines):

- a. Manufactured from virgin polyethylene in accordance with ASTM D2239, designated as PE 3408. Maximum size two inches (2"); minimum size one inch (1").
- b. Fittings: Manufactured in accordance with ASTM D2609; PVC Type 1 cell classification 12454-B.
- c. Clamps: All stainless steel worm gear screw clamps. Use two (2) clamps per joint on all insert fittings.
- d. Risers for Pop-up Heads: Shall be swing pipe, 0.49 ID, operating pressure of eighty (80) PSI, manufactured by Rainbird or approved equal.

2.3 VALVES

- A. Gate Valve or Isolation Valve:
 - 1. None required.
- B. Automatic Control Valve:
 - 1. None required.
- C. Manual Drain Valve:
 - 1. None required.
- D. Quick Coupling Valves:
 - 1. None required.
- E. Master Valve:
 - 1. None required.
- F. Flow Sensor Assembly:
 - 1. None required.
- G. Valve Boxes:
 - 1. None required.
- H. Backflow Preventer:
 - 1. None required.

2.4 SPRINKLER HEADS

- A. Heads: Provide fabricated riser units of the type and size as indicated on the Contract Drawings. Heads of a specific type or function in the system shall be of the same manufacturer and shall be marked with the manufacturer's name and identification in such a position that they can be identified without being removed from the system.
 - 1. Pop-Up Sprinkler Heads in turf areas: 1806 SAM-PRS.
 - 2. Pop-Up Sprinkler Nozzles shall be Rain Bird MPR Series nozzle. Gear Driven Heads: Hunter I-20, I-40 series with stainless steel risers, internal check valve, PRS and MPR as specified per Contract Drawings. Riser height shall be six inches (6") in turf areas.
- B. Flexible Connectors to Lateral Pipe:
 - 1. Pop-up Heads: Shall be one-half inch (1/2") swing pipe, connected to lateral pipe with male x insert spiral barbed ell PVC insert fittings.

2. Gear Driven Heads: Shall be field constructed PVC swing joints as per detail, connected to lateral pipe with PVC insert fittings.

2.5 LOW VOLUME IRRIGATION

- A. None required.

2.6 AUTOMATIC CONTROL SYSTEM

- A. Existing none required.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Utility Locates: Contact Utility Notification Center of Colorado at or 8-1-1 or 1-800-922-1987 prior to any excavation, for the marking of underground member utilities. The indication of utilities on the Contract Drawings does not relieve the Contractor of the responsibility for utility location. Contractor is responsible for potholing all utility locations to verify the depth and locations. Potholing related to irrigation installation shall be considered incidental to irrigation installation and will not be paid for separately. Route trenches to avoid existing utilities. Verify with the Project Manager any required relocation prior to installation.
- B. Landscape Plan Review and Coordination: Contractor will be held responsible for coordination between landscape and irrigation system installation. Landscape material locations shown on the Landscape Plan shall take precedence over the irrigation system equipment locations. If irrigation equipment is installed in conflict with the landscape material locations shown on the landscape plan, the Contractor will be required to relocate the irrigation equipment, as necessary, at Contractor's expense.
- C. Pressure Verification: Contractor shall field verify the tap size, static pressure and verify Gallons Per Minute flow at the project site, prior to commencing Work or ordering irrigation materials, and submit findings in writing to the Project Manager. If Contractor fails to verify tap size, static water pressure and flow prior to commencing Work or ordering irrigation materials, Contractor shall assume responsibility for all costs required to make system operational and the costs required to replace any damaged landscape material. Damage shall include all required material costs, design costs, labor costs and plant replacement costs.
- D. Inspection: Examine areas and conditions under which Work of this Section is to be performed. Do not proceed with Work until unsatisfactory conditions have been corrected.
 1. Grading operations, with the exception of fine grading, shall be completed and approved by Project Manager before staking or installation of any irrigation system begins.
- E. Layout: Layout and stake system before beginning installation. Staking shall occur as follows:
 1. Mark, with paint, routing of pressure supply line and flag heads for all new zones. Contact the Project Manager forty-eight (48) hours in advance and request review of staking. The Project Manager will review staking and direct changes if required. Review does not relieve installer from coverage problems due to improper placement of heads after staking.

3.2 EXCAVATION AND BACKFILL

A. Excavation:

1. Trenching:

- a. Trench excavation shall follow, as much as possible, the layout shown on Drawing. Dig trenches straight and support pipe continuously on bottom of trench. Trench bottom shall be clean and smooth with all rock and organic debris removed. Comply with OSHA standards for all trenching and excavation.
- b. Trenching under limb spread of existing trees: Accomplish by hand or other method that will not damage limbs or branches. Refer to Division 01 "Tree Retention and Protection" for additional precautions.

2. Clearances and Depths:

a. Pipe and Wire Depth to finish grade:

- 1) Non-pressure Piping (gear driven heads): eighteen inches (18") from top of pipe, maximum variation two inches (2").
- 2) Non-pressure Piping (pop-up heads): turf zones: eighteen inches (18") from top of pipe, maximum variation two inches (2")

3. Vibratory Plow: Not permitted without written authorization of the Project Manager.

3.3 INSTALLATION OF IRRIGATION EQUIPMENT

A. Installation of Piping:

B. Flexible Plastic (Polyethylene) Pipe: Lay pipe and assemble fittings according to manufacturer's recommendations and per Contract Drawings and details.

3.4 INSTALLATION OF SPRINKLER HEADS

A. Install sprinkler heads where designated after the Project Manager has approved staking. Set to finish grade as detailed.

1. Spacing of heads shall not exceed the maximum indicated on Drawing(s) unless re-staked or as directed by the Project Manager. In no case shall the spacing exceed maximum recommended by manufacturer.
2. Install gear driven heads on swing-joint risers as detailed. Swing joints to non-pressure lines shall be set at no more than forty-five degrees (45°) or less than ten degrees (10°).
3. Install pop-up heads on swing pipe as detailed.
4. Adjust part circle heads for proper coverage. Adjust heads to correct height after sod is installed. Plant placement shall not interfere with intended sprinkler head coverage, piping, or other equipment. The Project Manager may request nozzle changes or adjustments without additional cost to the City.

3.5 BACKFILLING

A. Do not begin backfilling operations unless authorized by the Project Manager and all required systems tests have been completed. Backfilling shall not be done in freezing weather unless authorized by the Project Manager. Leave trenches slightly mounded to allow for settlement after backfilling is completed. Trenches shall be finish graded and sodded or seeded prior to walk-through of system by the Project Manager.

1. Materials - Excavated material is generally considered satisfactory for backfill purposes. Backfill material shall be free of trash, organic matter, frozen materials, and stones larger than 2-inches in maximum dimension. Material not suitable for backfill shall be hauled away. Contractor shall be responsible for providing suitable backfill if excavated material is unacceptable or not sufficient to meet backfill, compaction, and final grade requirements.
2. Do not leave trenches open for a period of more than forty-eight (48) hours. Open excavations shall be protected in accordance with OSHA regulations.
3. Compact backfill to ninety-five percent (90%), determined in accordance with ASTM D698 utilizing the following methods in landscape areas:
 - a. Secondary Pipe: Backfill in two uniform lifts and mechanically compact each.

3.6 ADJUSTING

- A. Upon completion of installation, "fine-tune" entire system by regulating valves, adjusting arcs and radius, and setting pressure reducing valves at proper and similar pressure to provide optimum and efficient coverage. Flush and adjust all sprinkler heads for optimum performance and to prevent overspray onto walks, roadways, and buildings as much as possible. Heads of same type shall be operating at same pressure within plus or minus ten percent (10%).
- B. If it is determined by the Project Manager or Consultant that irrigation adjustments will provide improved coverage and water distribution, the Contractor shall make such adjustments prior to Final Acceptance. Adjustments may include but not limited to changes in nozzle sizes, degrees of arc, and control valve flow control regulations. Adjustments shall be completed at no additional costs to the City.
- C. All sprinkler heads shall be set perpendicular to finish grade or within allowable limits shown on Contract Drawings.
- D. Areas that do not conform to designated operation requirements, due to unauthorized changes or poor installation practices, shall be immediately corrected at no additional cost to the City.

3.7 CLEANING

- A. Maintain continuous cleaning operation throughout duration of Work. Dispose of, all trash, waste materials, debris and excess soil generated by installation of irrigation system off-site at no additional cost to the City. Contractor shall clear all debris, including, soil, from all paths, walks, roads, and other hard surface areas.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Irrigation Systems.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, earthwork, trenching, stockpiling, disposing, hauling off,

watering, dust control, erosion and sediment control, fine grading, as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 32 80 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing, stockpiling, and placing pre-manufactured and pre-amended topsoil on a previously prepared subgrade.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 31 Section "Earth Moving"
 - 3. Division 32 Section "Sodding".

1.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Planting Area: Areas to be planted.
- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- G. 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.
- H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 SUBMITTALS

- A. See Division 01 Section “Submittals” for submittal requirements.
- B. Soil Analysis Report: As indicated in Article 1.5 “Quality Control”, below.

1.5 QUALITY CONTROL

- A. Existing On-Site Topsoil:
 - 1. None required.
- B. Imported Topsoil:
 - 1. None required.
- C. Manufactured Topsoil:
 - 1. Submit source of manufactured topsoil to be imported to site for approval by Project Manager.
 - 2. Submit soil analysis report for pre-manufactured and pre-amended topsoil from the State University Agricultural Extension Service or other approved soil testing laboratory. Report shall cover soil textural classification (percentages of sand, silt, and clay), pH, percentage organic matter, and soluble salts (electric conductivity in millimos/centimeter).
 - a. Test is to be completed within sixty (60) days preceding delivery to site. Report shall cover soil textural classification (percentages of sand, silt, and clay), pH, percentage organic matter, and soluble salts (electric conductivity in millimos/centimeter).
 - b. Submit a one (1) quart sample along with analysis results.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver or place topsoil in a frozen, wet, or muddy condition.
- B. Protect stored and placed topsoil from vehicular traffic, equipment storage, material storage, or from contaminants or pollution sources. Topsoil that is compacted or tainted during construction is to be removed from site and disposed of at a licensed landfill at no additional cost to the City.

PART 2 - PRODUCTS

2.1 ON-SITE TOPSOIL

- A. None required.

2.2 IMPORTED TOPSOIL

- A. None required.

2.3 MANUFACTURED TOPSOIL

- A. "Amended Topsoil" as manufactured by A1 Organics, 16350 WCR 76, Eaton, CO 80615 Ph: (970) 454-3492, (800) 776-1644 Fax: (970) 454-3232 www.a1organics.com, or substitution as approved by Project Manager.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where the Work of this Section will be performed for compliance with requirements and conditions affecting installation and performance.
 - 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 the work area.
 - 2. Verify that final grades are completed in accordance with the Contract Drawings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by Project Manager.

3.2 PLACING TOPSOIL

- A. Scarify and thoroughly till compacted subgrade to a six-inch (6") depth to bond topsoil to subsoil. Topsoil shall be free from weeds, sod, and material larger than 1-inch (1"), toxic substances, litter or other deleterious material. Spread evenly and grade to elevations and slopes shown on Contract Drawings. Hand rake areas inaccessible to machine grading.
- B. Utilize manufactured topsoil as the top layer, placing over scarified subgrade to a depth of two-inches (2") uniformly over all areas to be sodded and deeper as required to improve grade off west edge of terrace as indicated on drawings.

3.3 PROTECTION AND REPAIR

- A. Protect completed areas where topsoil has been spread from traffic which will compact the soil volume. Any areas that, as determined by Project Manager, become compacted due to Contractor's construction traffic shall be reconstructed to specified requirements and approved by Project Manager.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Pre-Manufactured and pre-amended topsoil: Measurement will be based on the percentage complete for the lump sum contract amount for Topsoil.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, stockpiling, placing, spreading, shaping, rough and fine grading of pre-manufactured and pre-amended topsoil to specified and required depth, watering, dust control, erosion and sediment control, finish grading, sub grade preparation including scarifying and tilling of existing sub soil required to bring the site to the required lines and grades as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 32 91 20

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract 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 requirements for furnishing and installation of bluegrass sod, and maintenance of sodded areas as outlined in Maintenance Section 1.8.B. until Final Acceptance.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 31 Section "Earth Moving".
 - 3. Division 31 Section "Watering".
 - 4. Division 32 Section "Irrigation System".
 - 5. Division 32 Section "Topsoil".

1.3 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. This includes insecticides, miticides, pesticides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, herbicide, defoliant, or desiccant.
- C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- D. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- E. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- F. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- G. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

- H. Weeds: Including but not limited to Goathead, Bindweed, Twitch, Dandelion, Jimsonweed, Knapweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Weed, Bent Grass, Wild Garlic, Perennial Sorrel, and Broom Grass.

1.4 SUBMITTALS

- A. See Division 01 Section “Submittals” for submittal requirements.
- B. Product Data: For each type of product indicated.
 - 1. Pesticides: Include product label and manufacturer's application instructions specific to this Project.
- C. Sod Certificates:
 - 1. State, Federal and other inspection certificates for sod shall be provided to the Project Manager a minimum of 10 working days prior to anticipated date of sod delivery.
 - 2. Submit a list of varieties contained in the sod, and include the source and origin for approval by the Project Manager.
- D. Qualification Data: For qualified landscape Installer.
- E. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- F. Material Test Reports: For existing-in-place surface soil.
 - 1. Analysis for pre-manufactured topsoil.
- G. Analysis and standards: Wherever applicable, for non-packaged materials, provide two copies of analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists.
- H. Planting schedule: Submit in writing two copies of proposed planting schedule, indicating dates for topsoil placing, site preparation, pesticide treatments, soil preparation, sodding, seeding, and coordination with plant procurement, planting soil preparation, plant delivery and planting. Schedule all Work during specified planting seasons. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
- I. Maintenance Instructions: Recommended procedures for maintenance of turf and dryland grasses during a calendar year. Submit before expiration of required initial maintenance periods.
- J. Contract Closeout Submittals:
 - 1. Operating and Maintenance Data: At completion of work, submit one digital copy and two hard copies to the Project Manager in accordance with Division 01 Section “Contract Closeout”. Include directions for irrigation, aeration, mowing, fertilizing and spraying as required for continued and proper maintenance through full growing season and dormant period.
 - 2. Warranty for Turfgrass Sod Areas: At completion of work, furnish written warranty to Project Manager based upon specified requirements.

- K. The Project Manager reserves the right to reject the sod at any time prior to acceptance and that fails to meet specification requirements.

1.5 QUALITY CONTROL

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf and dryland grass establishment.
 - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
 - 2. Experience: Five years' experience in turf installation in addition to requirements in Division 01 Section "Quality Control."
 - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 4. Sod Producer: Company specializing in sod production and harvesting with minimum five (5) years' experience, and certified by the State of Colorado Department of Agriculture.
 - 5. Personnel Certifications: Installers shall have certification the following categories from the Professional Landcare Network:
 - a. Certified Landscape Technician - Exterior, with installation maintenance irrigation specialty area(s), designated CLT-Exterior.
 - 6. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
 - 7. Pesticide Applicator: State licensed, commercial.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Preinstallation Conference: Conduct conference at Project site to coordinate the process with other trades, to coordinate equipment movement within planting areas and to avoid soil compaction, to review proposed methods of installation, performance criteria, and maintenance procedures. Review underground utility location maps and plans. This meeting shall be coordinated by the Contractor, and comply with requirements in Division 1.
- D. Standards: All materials and methods used during this portion of the work shall meet or exceed applicable federal, state, county, and local laws and regulations. All sod shall be free from insects and disease. Species shall be true to their scientific name as specified.
- E. Materials: The Contractor shall submit to the Project Manager for approval a complete list of all materials to be used during this portion of the work prior to delivery of any materials to the site. Include complete data on source, amount and quality. This submittal shall in no way be construed as permitting substitution for specific items described on the plans or in these specifications unless approved in writing by the Project Manager.
- F. Source Quality Control:
 - 1. Sod Materials: Subject to inspection and acceptance. The Project Manager reserves the right to reject at any time or place prior to acceptance, any work and sod which in the Project Manager's opinion fails to meet these specification requirements.

2. Inspection will be made periodically during sodding, at completion and at end of warranty period by the Project Manager. Primarily for quality; however, other requirements are not waived even though visual inspection results in acceptance.
3. Promptly remove rejected sod from site.

G. Sod Standards:

1. Sod shall consist of healthy, thick turf having undergone a program of regular fertilization, mowing and weed control; free of weeds; uniform in green color, leaf texture and density; healthy, vigorous root system; inspected and found free of disease, nematodes, pests and pest larvae by the State Department of Agriculture.
2. Each piece of Sod shall consist of a sandy-loam soil base that will not break, crumble or tear during sod installation.
3. Sod thickness shall be a minimum three quarters inch (3/4") thick, excluding top growth and thatch.
4. Thatch layer shall not exceed one half inch (1/2"), uncompressed.
5. Sod shall be delivered and installed within twenty four (24) hours of being cut.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver on pallets properly loaded on vehicles with root system protected from exposure to sun, wind, and heat in accordance with standard practice. Sod that has been damaged by poor handling or improper storage is subject to rejection by the Project Manager.
1. Protect from dehydration, contamination, freezing and heating at all times. Keep stored sod moist and under shade or covered with moistened burlap.
 2. Do not drop sod rolls from carts, trucks or pallets.
 3. Do not deliver more sod than can be installed within twenty four (24) hours.
- B. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, warranty and conformance to state law.
- C. 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 fertilizers and soil amendments with appropriate certificates.
 4. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, and bearing name and warranty of producer.
- D. Material will be inspected upon arrival at project site. Project Manager will reject any opened or unacceptable materials as described above.
- E. Immediately remove unacceptable material from job site.

1.7 PROJECT/SITE CONDITIONS

- A. Work scheduling: Proceed with and complete landscape work as rapidly as portions of the site become available, working within the specified planting season and approved schedule.
- B. Vehicular accessibility on site shall be as directed by Project Manager. Repair damage to prepared topsoil and existing surfaces, caused by vehicular access and movement during work under this section, to original condition at no additional cost to the City.
- C. Install sod between April 15 and October 1 or when irrigation is available for twenty one (21) days per Denver Water's guidelines for sod establishment.
- D. Schedule work for periods of favorable weather. Do not install sod on saturated or frozen soil. The Project Manager reserves the right to deny sod installation on days that are deemed to be unfavorable for installation.
- E. Existing conditions:
 - 1. Existing Plants: Install sod only after all other landscape and irrigation items have been installed and accepted by the Project Manager.
 - 2. Utilities: Determine location of underground utilities. Perform work in a manner to avoid possible damage. Hand excavate, as required.
 - 3. Excavation: Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, noxious materials or obstructions, notify Project Manager before planting.
 - 4. If weeds are present on site, treat with pesticide prior to preparing soil for installing sod as specified in this or other Sections.
- F. Coordination:
 - 1. Coordinate with construction of utilities on site. Do not begin placing topsoil and sod until underground work is completed in the area.
 - 2. Coordinate sodding with Contractor(s) approved schedule. Limit construction access to areas where topsoil has been placed if placement is completed more than 3 days prior to commencement of landscaping in the area. Limit fine grading to areas that can be prepared for planting within twenty four (24) hours after fine grading.
 - 3. Coordinate with Contractors work requiring access to site over sodded areas.
 - 4. Coordinate with installation of underground irrigation system.

1.8 WARRANTY

- A. Warranty for Sod Areas: Warrant areas in sod to be in a healthy, vigorous growing condition, and for consistency and completion of coverage for a period of one year from date of Substantial Completion as a full stand of grass. Re-sod any spots larger than 12" square where sod has failed to establish, as defined in this Section. Continue this procedure until a successful stand of grass is growing and accepted by the Project Manager.
 - 1. During the original warranty period, re-sod at once with comparable blend/mix, those areas that have failed to achieve a stand of grass or which in the Project Manager's opinion are unhealthy.
 - 2. Re-sodding will not be allowed in any season considerable unfavorable for sodding by the Project Manager.

- B. Re-sod in a manner to achieve quality as originally specified per the Project Manager's direction

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Topsoil: See Division 32 Section "Topsoil".
- B. Sod:
 - 1. Colorado grown Kentucky Bluegrass blend having a healthy, vigorous root system. Blend shall contain a minimum of three (3) improved varieties, of which at least one variety is an aggressive type.
 - 2. Sod to be produced in accordance with requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding."
 - 3. Harvesting: Sod shall be fertilized 2–3 weeks prior to harvesting. Mow sod to a height of one and one-half inches (1-1/2") before the sod is lifted. Sod shall be harvested in rolls, and shall not be cut more than 24 hours prior to planting.
 - 4. Size: Machine cut to a minimum pad thickness of three quarters inch (3/4), excluding top growth and thatch. Provide sod of uniform pad sizes eighteen inches (18") maximum width by twenty four (24") minimum length, with maximum five percent (5%) deviation in either length or width. Broken pads or pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically from upper ten percent (10%) of pad will be rejected. Sod which has dried out, sod with adhering soil which breaks, tears, or crumbles away will not be accepted. Sod cut for more than twenty-four (24) hours will not be accepted.
 - 5. Plastic netting: Sod to be free of plastic netting used during establishment by sod grower.
- C. Fertilizer: Inorganic mixture with following chemical composition: (20-5-10) with fifty percent (50%) sulfur coated urea (no iron), or as recommended by testing lab based on soil sample results.
- D. Water: Contractor to utilize the existing irrigation system and or quick coupler(s) when available. If irrigation or quick coupler(s) are not available then the contractor is responsible for watering. Refer to Division 31 Section "Watering". Water shall be free of substances that may be harmful to sod growth. Hoses and other watering equipment necessary to water the sod to be furnished by Contractor.

2.2 PESTICIDES

- A. General: Pesticide, registered and approved by 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 Project Manager and authorities having jurisdiction.
 - 1. Pre-Emergent Pesticide (Selective and Non-Selective): Use only with approval by Project Manager. Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
 - 2. Post-Emergent Pesticide "Round-up" by Monsanto, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
 - 1. Verify that finish grades are consistent with the slopes and grades indicated on the Contract Drawings. Verify grades are in conformance with Division 31 Section "Earth Moving".
 - 2. 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.
 - 3. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 4. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 5. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by the Project Manager.
- 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 Engineer and replace with new planting soil.
- D. Acceptance: Beginning of installation means acceptance of existing conditions by the Contractor.

3.2 PREPARATION

- A. Work notification: Notify the Project Manager at least seven (7) working days prior to start of sodding operations.
- B. Limit turf subgrade preparation to areas that can be sodded within twenty four (24) hours.
- C. Newly Graded Subgrades: Prepare soil as required by Division 32 Section "Soil Preparation".
- D. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least six (6"). Apply pre-manufactured topsoil and thoroughly till into top six inches (6") of soil. Till soil to a homogeneous mixture of fine texture. Fine grade entire area to receive sod to .04' of line and grades indicated.
 - 3. Remove stones larger than one-half (1/2") inch in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off City property.
- E. Moistened prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

- F. Verify that all areas are graded to drain at a minimum of two percent (2%) or as indicated on the Contract Drawings. Verify that subsurface drainage system and drain inlets if any, are operative.
- G. Verify that irrigation system is operable and provides adequate coverage prior to planting.
- H. Adjustment: Adjust irrigation heads to proper watering height according to depth of sod material but lower than compacted blade height to enable lawn mowers to cut grass freely without damage to the sprinkler system.
- I. When completed, the soil shall be firmed by float dragging, followed by steel raking, to provide for the proper sodded subgrade. The sod bed shall be totally free from rock or clay clods over one-half inch (1/2") inch in diameter.
- J. Repair: Re-establish grade and specified conditions to damaged sod areas prior to placing sod.

3.3 INSTALLATION

- A. Sodding:
 1. Sod within twenty-four (24) hours after preparation of bed.
 2. If plastic netting is present within sod, remove all netting during sod installation and discard from site.
 3. Subgrade on which sod is laid shall be slightly moist during installation.
 4. Lay sod with longest dimension parallel to contours and in continuous rows.
 5. Tightly butt ends and sides of sod together. Stagger and compact vertical joints between sod strips.
 6. Sod shall not be overlapped or stretched during placement. Exposed joints due to shrinkage will require replacement of sod in affected areas.
- B. Topsoil: Where new sod abuts an existing turf area topsoil shall be placed along seams and or joints to provide a smooth transition.
- C. Rolling: Sod shall be rolled after installation to ensure proper contact with the subgrade, and to ensure tight joints between adjacent pieces. Sod shall be moist prior to rolling. Once rolling is complete additional watering shall occur. Roller shall weigh one-hundred (100) pounds.
- D. Drainage: Contractor shall ensure that finished areas are graded so that positive drainage of storm and irrigation water is achieved.
- E. Water thoroughly with a fine spray as laying progresses and immediately after planting. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (1-1/2 ") below sod.
- F. After sod and soil have dried, roll sodded areas to ensure a good bond between sod and soil and to remove minor depressions and irregularities. Roller shall not exceed one hundred (100) pounds.

3.4 FERTILIZING

- A. Distribute (20-5-10) fertilizer uniformly at the rate of five (5) pounds of material per one-thousand (1,000) square feet, one (1) pound of actual nitrogen per thousand (1,000) square feet immediately after initial sodding operations and every sixty (60) days thereafter until Final Acceptance of project by the Project Manager.

3.5 PROTECTION

- A. Protect existing utilities, paving and other facilities from damage caused by sodding operations, Contractor shall repair any damage at no additional cost to the City.
- B. Restrict vehicular and pedestrian traffic from sodded areas until grass is established. Erect signs and barriers as required or directed by the Project Manager at no additional cost to the City.
- C. Locate, protect and maintain the irrigation system during sodding operations. Repair irrigation system components damaged during sodding operations shall be replaced or repaired to current City irrigation standards at Contractor's expense.
- D. Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited materials on the site throughout the duration of work.

3.6 MAINTENANCE

- A. General: The maintenance period shall begin immediately after each area is sodded and continue for Sixty (60) days or as determined by the Project Manager. During this time, the Contractor is responsible for watering, mowing, spraying, weeding, fertilizing and all related work as necessary to ensure that sodded areas are in a vigorous growing condition. Provide all supervision, labor, material and equipment to develop and maintain sodded areas from time of installation.
- B. Mowing and Trimming: When turfgrasses reach three and one-half inches (3-1/2") in height, begin weekly mowing program to maintain turf at two and one-half inches (2-1/2") to three inches (3") in height. Do not remove more than 1/3 the height of the grass blade in single mowing. Do not mow when grass is wet. All clippings from adjacent paved areas shall be removed and clippings from mowed turf areas shall be removed to the satisfaction of Project Manager.
- C. Fertilizing: Within thirty (30) days of sodding and every sixty (60) days thereafter until Acceptance, apply specified fertilizer to maintain optimal turf vigor or per the direction of the Project Manager.
- D. Weed Control: Control annual weeds by mowing. Do not use pesticides unless approved by the Project Manager and Denver Parks Operations Supervisor.
- E. Insect and Disease Control: As needed, apply insecticide and fungicide approved by the Project Manager and the Parks Operations Supervisor.

3.7 ACCEPTANCE

- A. Acceptance of sodded areas will not be given until Project Manager is satisfied with establishment and a full stand of grass, in a vigorous growing condition, and thoroughly rooted to the soil and absence of visible joints. The sodded areas shall be accepted on the basis of having a healthy, uniform stand of turf over the entire sodded area. Sixty (60) days after sodding, the sodded areas shall be reviewed by the Project Manager and the Contractor. Any areas as determined by the Project Manager where the sod has failed to establish shall be re-sodded. Acceptable sod establishment shall be defined healthy uniform turf that does not contain any stressed or bare spots greater than one square foot. After Acceptance, maintenance shall become the responsibility of the City.

3.8 PROTECTION

- A. General: Provide and install barriers as required and as directed by Project Manager to protect sodded areas against damage from pedestrian and vehicular traffic until Final Acceptance.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Sodding.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, earthwork, loading, transporting, stockpiling, disposing, hauling off, watering, dust control, erosion and sediment control, fine grading, temporary protection by fencing or other means, watering, fertilizing and all maintenance required until Final Acceptance of the work as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 32 92 23

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing and installation of sub-drainage systems as shown on the Contract Drawings, as specified herein, or as required to complete the work. Including pipe, fittings, transition couplings, wall daylights, rodent screens and 1 ½” washed drainage rock medium.
- B. Related Work:
 - 1. Division 01 Section “Layout of Work and Surveys”.
 - 2. Division 01 Section “Contractor Quality Control”.
 - 3. Division 01 Section “Erosion and Sedimentation Control”.
 - 4. Division 01 Section “Materials and Equipment”.
 - 5. Division 31 Section “Earth Moving”.
 - 6. Division 32 Section “Sodding”.

1.3 SUBMITTALS

- A. See Division 01 Section “Submittals” for submittal requirements.
- B. Product Data: For each type of product for approval prior to construction.
 - 1. Piping: Submit twelve inch (12”) length of each type of underdrain piping to be used.
 - 2. Geotextile Fabric: Submit twelve inch (12”) by twelve inch (12”) sample.
 - 3. Bedding material: Submit one (1) quart sample.
 - 4. Filter material: Submit one (1) quart sample.

1.4 QUALITY CONTROL

- A. Installer Qualifications: Engage an experienced Installer who has completed subdrainage work similar in material, design, and extent to that indicated for this Project and with a record of successful project completion and operation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Materials: Deliver materials in original containers. Protect materials from damage during delivery and while stored at site. The Project Manager reserves the right to inspect containers before or after installation to verify compliance with Specifications.
- 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.
4. Protect piping and geotextile fabric from damage or contamination with soil or other construction materials from time of deliver to installation.

1.6 PROJECT/SITE CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and related construction contiguous with proposed subdrainage installations by field measurements before proceeding with planting work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. PVC under drain: ASTM D2729, minimum 4-inch diameter, plain or perforated type as indicated on the Contract Drawings, with required fittings. Perforated pipe shall comply with requirements of ASTM 272a, with 2 rows of evenly spaced three eighths inch (3/8") diameter perforations, one hundred twenty (120)-degrees apart, providing a minimum number of holes of four (4) per foot.
- B. Geotextile Fabric: Non-woven fabric "140N" by Tencate-Mirafi or acceptable substitution.
- C. Bedding Material: Class-1 structural fill placed and shaped to the lines and grades indicated on plan. Structural fill bedding material is to be paid for as part of the lump sum earthwork pay item.
- D. Filter Material: One and one half (1 1/2") washed river rock depth varies on plan. Placed between the Class 1 structural fill bedding material and the bottom of the crushed rock stabilizer bed for pavers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine areas where the Work of this Section will be performed for compliance with requirements and conditions affecting installation and performance.
 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 the work area.
 2. Verify that final grades are completed in accordance with the drawings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by Project Manager.

- C. PVC under drain: Install pipe under drains as shown on the Contract Drawings. Pitch shall be a minimum of one half of one percent (0.5%) or as shown on Contract Drawings. Contractor is responsible to immediately notify the Project Manager of any discrepancies.
- D. Solid Pipe: Refer to the City and County of Denver Wastewater Storm Drainage and Sanitary Construction details and specifications document available at the following website:
<https://www.denvergov.org/content/denvergov/en/right-of-way-services/engineering-regulatory-analytics/engineering-plan-review/manuals-regulations.html>
- E. Geotextile fabric is to be placed between the sand setting bed and the crushed rock stabilizer bed for stone pavers and is to be paid for as part of the lump sum pay item for stone pavers. Contractor is responsible to ensure that no debris, sediment or foreign material enters the granular fill that inhibit drainage. Any installation that does not meet these standards shall be replaced at the direction of the Project Manager at no additional cost to the City. Fabric edges shall overlap at least 12-inches.

3.2 CLEANING

- A. Clean and flush out lines before covering. Remove and legally dispose of all waste material and debris offsite.

3.3 RESTORATION

- A. Restore all fences, ditches, yards, lawns, and other structures or surfaces to condition equal to or better than before work began.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Subdrainage Systems.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, excavation, stockpiling, disposing, hauling off, associated fittings, joints, joint materials, trenching, bedding materials, connections to other pipes or structures, compaction watering, dust control, erosion and sediment control, fine grading, transition couplings, wall daylight and rodent screens as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 33 46 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing and installing four color rustic terrazzo panorama complete and in place including but not limited to all required existing panorama documentation, installer qualification submittals, material submittal and mock ups, under bed installation, divider strip installation, expansion joint installation, terrazzo installation, resetting of interpretive granite stone sets, sealing and maintenance manual preparation in conformance with detail D Sheet D3.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 03 Section "Cast In Place Concrete".
 - 3. Division 03 Section "Sand Stone Pavers".

PART 2 - PRODUCTS**2.1 CEMENT, SAND, MARBLE CHIPS, COLOR PIGMENT, AND DIVIDER STRIPS**

- A. All products are to be supplied in conformance with Detail D on Sheet D3 and in conformance with the National Terrazzo and Mosaic Association, Standards and Specifications made part of these requirements by reference.

PART 3 - EXECUTION**3.1 INSTALLATION OF UNDER BED, DIVIDER STRIPS, EXPANSION JOINTS AND TERRAZZO SURFACING MATERIAL**

- A. All work is to be executed in conformance with Detail D on Sheet D3 and in conformance with the National Terrazzo and Mosaic Association, Standards and Specifications made part of these requirements by reference.

PART 4 - MEASUREMENT AND PAYMENT**4.1 MEASUREMENT**

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Front Range Terrazzo Panorama installation.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, installation, sealing and clean up as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 33 47 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for all horizontal stand stone work across the project furnished and installed complete and in place including but not limited to furnishing and installation of sawed face, sawed end and sawed top Lyons Red grade transition step blocks, furnishing and installation of new random ashlar pattern snapped bed and sawed face Lyons Red sand stone pavers on the upper terrace and furnishing and installation of random pattern snapped bed and snapped face Lyons Red sandstone pavers on the lower terrace including crushed rock stabilizer bed, drainage fabric, and sand setting bed.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 03 Section "Cast In Place Concrete".
 - 3. Division 03 Section "Concrete Walks, Curbs and Miscellaneous Faltwork".
 - 4. Division 03 Section "Front Range Terrazzo Panorama".

PART 2 - PRODUCTS**2.1 RANDOM ASHLAR PATTERN UPPER TERRACE SANDSTONE PAVERS**

- A. Material: Natural 2.5" thick snapped bed and sawed face sandstone.
- B. Color: Lyons Red.
- C. Size: 2'0" by 2'0" square, 2'0" by 4'0' rectangular and 4'0" by 4'0' square.
- D. Pattern: Random Ashlar.
- E. Joints: ¼" polymeric sand filled.

2.2 RANDOM PATTERN LOWER TERRACE SANDSTONE PAVERS

- A. Material: Natural 2.5" thick snapped bed and snapped face sandstone.
- B. Color: Lyons Red.
- C. Size: minimum of (one) 1 square foot to a maximum of (five) 5 square feet.
- D. Pattern: Random Pattern.
- E. Joints: ½" field fit and polymeric sand filled.

2.3 GRADE TRANSITION STEP BLOCKS

- A. Material: Natural hard surface, tight grain sand stone.
- B. Color: Lyons Red.
- C. Size: 8" high by 12" thick by 36" long.
- D. Pattern: Step Pattern.
- E. Joints: Flush joints stabilized and sealed with construction adhesive.

2.4 SETTING BED MATERIALS

- A. Crushed rock stabilizer bed: ¾" crushed and washed granite stone per ASTM-C33 placed 4" deep and compacted in place to 95% MPD per ASTM D-1557.
- B. Drainage filter fabric: Non-woven geotextile fabric "140N" by Tencate-Mirafi or approved equal overlap joints 12" minimum.
- C. Sand setting bed: clean washed concrete sand placed 2" deep and compacted in place to 95% MPD per ASTM D-1557. All paver joints are to be filled with polymer amended sand.

2.5 SUBMITTALS

- A. Submit five samples of upper terrace field stones representing extreme range of surface color and texture.
- B. Submit five samples of lower terrace field stones representing extreme range in surface color and texture. Field fit snapped faces of sample stones for inspection prior to submittal.
- C. Submit three samples of grade transition step blocks representing the extreme range of surface color, texture and hardness / grain.
- D. Sand setting bed material 1 Cu. Ft. sample and sieve analysis, ¾" stabilizer rock 1 Cu. Ft. sample and confirmation of ASTM C-33 compliance.
- E. Geotextile fabric: one Sq. Ft. sample and manufacturers product literature.
- F. Polymeric sand: Submit manufactures product literature for material.
- G. Grade transition step block construction adhesive: Submit manufacturers product literature for material.

2.6 MOCK UPS

- A. Prepare a 10' by 10' mockup of both upper terrace paving stones with ¼" sawed face joints and lower terrace paving stones with ½" field fit joints. Prepare a 10 Lin. Ft. section of grade transition step blocks set out to represent flush face and end jointing.

2.7 QUALITY CONTROL

Stone is to be free of fractures, scars, or defects which may impair the paver strength, surface durability or appearance. Any material damaged during transportation, handling or installation will be replaced at no additional cost to the Owner. Handle and store all stone pavers in a manner to avoid chipping, breakage, contamination, staining or soiling.

PART 3 - EXECUTION

3.1 INSTALLATION OF STONE PAVERS

- A. All work is to be executed in conformance with drawings and specification. Set pavers to lines and grades indicated on plan. Field fit pavers against reinstalled perimeter cap and step stones and along inside face of terrazzo panorama. Set all pavers to flush out with surface of perimeter cap and step stones, surface of terrazzo panorama and or surface of perimeter concrete sections and slope all pavers uniformly throughout.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for stone pavers.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, installation, sealing and clean up as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 33 48 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for restoration of the sand stone sundial, including providing all handling and transportation of the sundial including protection during lifting, loading, off loading, resetting and in transit, sun dial resurfacing, restoration, repair and recutting, resetting on the terrace and coordination with Owners Representative to insure alignment. Arranging and paying for a crane as required to lift, off load, reload and reset the sun dial (six lifting loading and unloading operations required). Transportation of the sun dial from the terrace to Camp Stone 3700 W.69th Pl., Westminster, Colorado 80030 (303) 429-9545, transportation from Camp Stone to Erickson Monuments 1245 Quivas Street, Denver, Colorado 80204 (303) 571-5151, transportation from Erickson Monuments back to the site. All costs of sun dial resurfacing, restoration, repair and recutting by Camp Stone and Erickson Monuments are to be included in this pay item. Contact Rebecca Stuart at Erickson Monuments for pricing and coordination.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 31 Section "Earth Moving".
 - 3. Division 31 Section "Cast In Place Concrete"

PART 2 - PRODUCTS**2.1 NONE SPECIFIED****PART 3 - EXECUTION****3.1 HANDLING AND TRANSPROTATION**

- A. Provide a lifting crane with all required nylon lifting straps, blocking, shoring and protective covers as required to insure that the sun dial is not in any way damaged during loading, offloading, reloading and resetting operations.
- B. Contractor to photographically document the existing surface condition of the sundial and submit in report format to Owner prior to lifting.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for sun dial restoration.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include all required materials, equipment, transportation and labor to handle, transport, restore, and reset the sun dial in accordance with the Contract Drawings and Specifications.

END OF SECTION 44 41 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for replacement of the existing interpretive sand stone panels located on the upper terrace including two analemma stones, one commemorative sundial stone and five historical text stone panels all located on the upper terrace. Existing panels are to be replaced to match existing in size, text, font, and line work exactly. Replacement panels are to be cut from 2 ½” thick flame finished Colorado Rose Red Granite. Submit sample of material to Owner for review and approval prior to fabrication of replacement panels. Pay item to include all existing panel documentation, all handling as required to lift, load and off load existing panels at Erickson Monuments, cutting of replacement granite panels, transportation of replacement panels to the site and resetting of replacement panels on sand bed as directed by the Owners Representative. Including transportation of the existing stone panels to and transportation of replacement panels from Erickson Monuments 1245 Quivas Street, Denver, Colorado 80204 (303) 571-5151. All costs for documentation, handling, transportation and production of replacement panels by Erickson Monuments are to be included in this pay item. Contact Rebecca Stuart at Erickson Monuments for pricing.
- B. Related Sections:
 - 1. Division 01 Section “Erosion and Sedimentation Control”.
 - 2. Division 31 Section “Earth Moving”.
 - 3. Division 31 Section “Cast In Place Concrete”

PART 2 - PRODUCTS**2.1 NONE SPECIFIED****PART 3 - EXECUTION****3.1 HANDLING AND TRANSPROTATION**

- A. After documentation carefully lift stone panels and support with required nylon lifting straps, blocking, shoring and protective covers as required to insure that the existing panels are not broken or damaged during loading, transportation or offloading operations.
- B. Contractor to photographically document the existing surface condition of the existing panels and submit in report format to Owner prior to lifting.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for interpretive stone panels.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include all required materials, equipment, transportation and labor to handle, transport, restore, and reset the two analemma, one memorial and five historical text sand stone panels, as well as fabrication, transportation, handling and setting of replacement granite panels on sand setting bed.

END OF SECTION 44 42 00

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for installation of donor recognition paver field furnished and installed complete and in place including but not limited to furnishing and installation of split bed sawed face donor recognition pavers including crushed rock stabilizer bed, drainage fabric, and sand setting bed.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 03 Section "Cast In Place Concrete".
 - 3. Division 03 Section "Concrete Walks, Curbs and Miscellaneous Flatwork".

PART 2 - PRODUCTS**2.1 DONOR RECOGNITION PAVER BLCOKS**

- A. Material: Natural 2.5" thick snapped bed and sawed face sandstone.
- B. Color: Lyons Red.
- C. Size: 4" by 4" square.
- D. Pattern: Uniform square.
- E. Joints: ¼" sand filled.

2.2 SETTING BED MATERIALS

- A. Crushed rock stabilizer bed: ¾" crushed and washed granite stone per ASTM-C33 placed 4" deep and compacted in place to 95% MPD per ASTM D-1557.
- B. Drainage filter fabric: Non-woven geotextile fabric "140N" by Tencate-Mirafi or approved equal overlap joints 12" minimum.
- C. Sand setting bed: clean washed concrete sand placed 2" deep and compacted in place to 95% MPD per ASTM D-1557.

2.3 SUBMITTALS

- A. Submit five samples of donor recognition paver blocks representing extreme range of surface color and texture.

B. Sand setting bed material 1 Cu. Ft. sample and sieve analysis, ¾" stabilizer rock 1 Cu. Ft. sample and confirmation of ASTM C-33 compliance.

C. Geotextile fabric: one Sq. Ft. sample and manufacturers product literature.

2.4 MOCK UPS

A. Prepare a 10 Sq. Ft. mockup of donor recognition paver blocks with ¼" sawed face joints.

2.5 QUALITY CONTROL

Stone is to be free of fractures, scars, or defects which may impair the paver strength, surface durability or appearance. Any material damaged during transportation, handling or installation will be replaced at no additional cost to the Owner. Handle and store all stone pavers in a manner to avoid chipping, breakage, contamination, staining or soiling.

PART 3 - EXECUTION

3.1 INSTALLATION OF STONE PAVERS

A. All work is to be executed in conformance with drawings and specifications. Set pavers to lines and grades indicated on plan. Set all pavers to flush out with surface of perimeter concrete sections and slope all pavers uniformly throughout.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement will be based on the percentage complete for the lump sum contract amount for donor recognition pavers.

4.2 PAYMENT

A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, installation, sealing and clean up as required in accordance with the Contract Drawings and Specifications.

END OF SECTION 44 42 20

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing and installing two new trash receptacles, for installing new interpretive metal sign panel (to be fabricated and supplied by Owner), salvage, storage and reinstallation of four memorial benches including recognition plaques, salvage, storage and reinstallation of dog waste station, salvage, storage and reinstallation of rules and regulations sign, salvage, storage and reinstallation of handicap parking sign on new 2" schedule 40 standard steel galvanized post with top cap finished as specified.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 03 Section "Concrete walks, curbs and miscellaneous flatwork".

PART 2 - PRODUCTS**2.1 TRASH RECEPTACLES**

- A. Victor Stanley S-42 trash receptacle color Denver green available from Victor Stanley @ 1-800-368-2573 mounted to concrete trash receptacle slab per manufacturer's recommendations (two required). Miscellaneous mounting hardware including Hilti Quick Bolt expansion anchors for bench reinstallation and mounting and concrete footers for reinstallation of posts.

PART 3 - EXECUTION**3.1 MOUNTING**

- A. Benches and plaques are to be reinstalled square to concrete mounting slabs and positioned with clear dimensions as per plan.
- B. Trash receptacles are to be centered in concrete mounting slabs and are to be plumbed vertical.
- C. Sign posts are to be installed plumb with signage set at existing elevation above grade.

3.2 CLEANING

- A. Clean all exposed furniture, plaque, sign and post surfaces as required to remove any surface staining and accumulated debris and dust.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for site furniture.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, salvage, storage, installation and reinstallation, mounting and cleaning as required in accordance with the Contract Drawings and Specification.

END OF SECTION 44 42 40

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing and installing two new accessible ramp hand rails including but not limited to material procurement, shop fabrication, cutting, bending joining, welding, grinding and matt finishing of rail components. Transportation of rails to site with field fitting, bending and welding as required.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 03 Section "Concrete walks, curbs and miscellaneous flatwork".

PART 2 - PRODUCTS**2.1 STEEL SECTIONS**

- A. Base plates: ½" thick 4" square steel with two 6" by 2" by ½" diameter embed j-bolts all fabricated out of 304 Stainless Steel. Including all required shop and field welds. Exposed surfaces to receive bead blasted matt finish. Bevel corners on plates ¼" all sides.
- B. Posts: 1.5" diameter round steel tube with ¼" wall 3.338 pounds per foot fabricated out of 304 Stainless Steel. Including all required shop and field welds. Exposed surfaces to receive bead blasted matt finish. Grind all exposed welds smooth.
- C. Rails: 1.5" diameter round steel tube with ¼" wall 3.338 pounds per foot fabricated out of 304 Stainless Steel. Including all required shop and field welds. Exposed surfaces to receive bead blasted matt finish. Grind all exposed welds smooth.

PART 3 - EXECUTION**3.1 MOUNTING**

- A. Embed base plates into thickened edge of accessible concrete ramp during concrete pour. Base plates to be set square to edge of ramp with outside face of plates 2" from outside edge of ramp which sets center line of rails and j-bolt location 4" from outside edge of ramp.
- B. Angle cut bottom of posts in order to install them plumb in all directions.
- C. Field fit rails with radius off set from inside and outside radius of assessable ramp.
- D. Weld continuous and grind smooth all connections.

3.2 CLEANING

- A. Clean all exposed steel section as required to remove any surface staining or accumulated debris and dust.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for steel fabrication.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, salvage, storage, installation and reinstallation, mounting and cleaning as required in accordance with the Contract Drawings and Specification.

END OF SECTION 44 42 60

PART 1: GENERAL

- 1.1 **SCOPE:** Furnish all labor, materials, supplies, equipment, tools, and transportation, and perform all operations in connection with and reasonably incidental to complete installation of stone-veneered walls as shown on the drawings and as specified herein. The work shall include, but not be limited to, the following:
- A. Sandstone veneer.
 - B. Sandstone cap.
 - C. Dovetail anchors.
 - D. Sandstone cap anchors.
 - E. Expansion joint sealant and expansion joint material.
 - F. Masonry sealer.
 - G. Coordination with built-in items supplied by other sections (such as dovetail anchors slots).
- 1.2 **RELATED WORK SPECIFIED ELSEWHERE:**
- Cast-In-Place Concrete - Section 03 30 00
- 1.3 **QUALITY ASSURANCE:**
- A. Stone mason shall provide references and qualifications which indicate a minimum of 3 years experience in sandstone masonry construction of this type.
 - B. Erect a panel on the site typical full elevation of wall, including cap. Sample section may be retained as a portion of the wall if accepted by the Landscape Architect.
 - C. The panel shall be indicative of the color range, texture, bond, mortar, and workmanship.
 - D. Work on the wall shall not proceed until the panel has been accepted by the Landscape Architect.
 - E. The panel will be used as a standard of comparison for all masonry work.
 - F. Do not destroy or move the panel until work is completed and accepted by the Owner.
 - G. Owner may elect to conduct tests at any time to verify that mortar is proportioned and installed as specified.
- 1.4 **SUBMITTALS: Samples:** Furnish a minimum of six individual samples of sandstone and three individual samples of sandstone caps, showing extreme variations in color and texture, for approval of the Landscape Architect before ordering stone from the quarry.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Storage: Store stone off the ground to prevent contamination by mud, dust, or materials likely to cause staining or other defects. Do not place materials in such a manner as to limit access to other work.
- B. Protection: Protect all materials from the elements with covers, if necessary.
- C. Deliver and store manufactured products in original unopened container.
- D. Store cementitious ingredients in weather-tight enclosure to protect against contamination and warehouse set. Protect from freezing. Protect additive from temperature extremes in accordance with manufacturer's recommendations.

1.6 ENVIRONMENTAL REQUIREMENTS:

- A. Protection of Work: Cover sections completed that day with a strong waterproof membrane at end of each day or shutdown. Extend membrane at least 24-inches down all sides of walls and anchor in place.
- B. Do not apply concentrated loads for at least three days after mortar has set. Do not submerge veneer for at least ten days after mortar has set and sealer has been installed.
- C. Staining: Prevent grout or mortar from staining the face of the stone to be left exposed. Immediately remove grout or mortar in contact with such stone.
- D. During freezing or near-freezing weather, provide equipment and cover to maintain a minimum of 50⁰F to protect stone work completed or in progress. Maintain protection for a minimum period of 5 days at 50⁰F or 3 days at 70⁰F until mortar has thoroughly cured.

PART 2: MATERIALS

2.1 SANDSTONE VENEER:

- A. Type: Lyons Red Sandstone, 75% split face and 25% natural stained surface, free of defects detrimental to appearance or durability.
- B. Size: Width 4-inches plus or minus ¼ inch, height 2-1/2 inches plus or minus 1/8 inch, length 8 - 24-inches.

2.2 SANDSTONE CAP:

- A. Type: Lyons Red Sandstone free of defects detrimental to appearance or durability. Sandstone for cap shall be from the "blue top" formation or equivalent. The intent is to install stone with a minimum of stratification in this area.

- B. Surfaces: Top surface shall be smooth and not vary more than 1/8-inch from a continuous plane. Exposed sides shall be guillotine cut, but shall not vary more than 1/2-inch from a continuous plane. Back sides shall be saw cut if necessary to align with adjacent sections of stone.
- C. Size: Width and length as indicated on the drawings plus or minus 1/4 inch, with height as indicated on drawings plus or minus 1/8 inch.

2.3 TIES AND ANCHORS:

- A. Dovetail Anchors: Open triangular stainless steel type, 3/16-inches in diameter, and 3-1/2-inches long; Dur-O-Wal D/A 720 or equivalent. Dovetail anchors to concrete shall consist of an anchor and a dovetail slot. The dovetail slot shall be stainless steel and shall be furnished and cast into the concrete wall prior to installation of stone masonry. (Refer to Section 03 30 00).
- B. Capstone Anchors: Fabricate according to the dimensions shown on the Drawings.

2.4 CAULKING:

- A. Caulk: Sika Sikaflex 2cNS or Sikaflex 2cSL sealant, as shown on drawings, colored to match mortar joints.
- B. Filler: Expanded polyethylene, polyurethane or polyvinyl chloride flexible foam. Material to be compatible with caulk.

2.5 SEALER:

- A. Chemstop Regular Masonry Water Proofing by Chemstop, Clear Double 7 by Hydrozo, or Consolideck SX by ProSoCo.

2.6 NON-SHRINK CEMENTITIOUS GROUT FOR CAPSTONE ANCHORS:

- A. Por-Rock Anchoring Cement or equal.

2.7 MORTAR:

- A. Portland Cement: ASTM C150, Type 1, low alkali (0.60% max. $\text{Na}_2\text{O} + 0.658 \text{K}_2\text{O}$), non air-entraining.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Aggregate: Sand per ASTM C144, clean, natural
- D. Mixing Water: Potable
- E. Additive: SikaBond, manufactured by Sika Corporation, P.O. 297, Lyndhurst, NJ 07071

PART 3: EXECUTION

3.1 PREPARATION:

- A. Supply sufficient quantity of embedded anchorages in concrete as specified on drawings and in Section 03 30 00 – Cast-In-Place Concrete, and provide for correct placement.
- B. Verify that items built in under other sections are properly located and sized.
- C. Prior to installation of sandstone veneer, complete all backfilling of walls.
- D. Establish lines, levels, and coursing. Protect from disturbance.
- E. Clean stone prior to erection, leaving edges and surfaces free of dirt or foreign material. Do not use wire brushes or implements which mark or damage exposed surfaces.
- F. Surfaces of concrete to receive stone veneer, including column side walls and caps and adjacent wall edges, shall be cleaned of substances which may reduce bonding with mortar. A light sandblast finish shall be applied to the concrete surface prior to applying the stone veneer.

3.2 MORTAR PROPORTIONS:

- A. Mortar for all stone veneer masonry shall have following proportions, by volume:

1	part	Portland Cement
1/2	part	Hydrated Lime
4 1/2	parts	Aggregate (measured in a damp, loose condition)

Water/Additive Solution: As required for workability, in solution form. Mix in a 4:1 (water: additive) solution; otherwise in strict accordance with manufacturer's recommendations.

- B. Mix all materials in a mechanical mixer for a minimum of 5 minutes, using sequence recommended by additive manufacturer (e.g. water/additive solution mixed first). Add extra water/additive solution as required until mortar is of a satisfactory, workable consistency. If mortar begins to stiffen from evaporation or absorption of mixing water, retemper immediately with water/additive solution.

3.3 VENEER INSTALLATION:

- A. Arrange stone in ashlar pattern and provide consistent joint work throughout.
- B. Set stone in full mortar setting bed to support stone over full bearing surface and to establish joint dimensions. Install anchors at maximum of 16-inch vertical spacing into dovetail anchor slots.
- C. Mortar joints shall be allowed to vary from 3/8-inch to 1/2-inch in width.

- D. Stone shall be laid with approximately 25% of the pieces projecting from the wall face in varying amounts up to 1/2-inch within any 10 square foot area on the walls. Projecting pieces shall be 50% two end clipped and 50% three side clipped.
- E. Rake all joints 1/2-inch.
- F. Stone shall be laid to expose 25% of its stained face within any 10 square foot area on the walls.
- G. Immediately prior to placing mortar and stonework, apply a coat of water/additive solution (see Part 3-2, Mortar Proportions) to concrete surface in the immediate area of the next stone placement by using a paint brush or similar means. Do not allow solution to dry on concrete surface before placement of mortar and stone.
- H. Thoroughly fill space between back surface of stone and vertical surface of concrete with mortar as work progresses to achieve adequate bond to concrete surface.
- I. Continue wall control and expansion joints through veneer and install joint filler and caulk at appropriate time.

3.4 CAPSTONE INSTALLATION:

- A. Set capstone with nominal overhang from face of sandstone veneer as shown on drawings.
- B. Anchor all capstone with Capstone Anchors. Set anchors with non-shrink cementitious grout.
- C. Miter all corner joints.
- D. Set stone in full mortar setting bed to support stone over full bearing surface.
- E. Joints shall be full head joints 1/2-inches nominal width. Tool concave joints flush with capstone top.

3.5 CLEANING:

- A. Masonry Surface: Clean with brushes and water. If cleaning agent is needed, test on sample wall panel and obtain approval of the Landscape Architect. Upon approval, proceed. Apply to small sections of wall in accordance with manufacturer's recommendations.

3.6 CAULKING:

- A. Install filler and apply and properly cure caulking in accordance with manufacturer's recommendations.
- B. Place joint filler and caulk at all wall and stair expansion joints.

- 3.7 SEALING: After cleaning and caulking of masonry, apply sealer to all sandstone veneer masonry surfaces per manufacturer's recommendations.

PART 4: MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for Stone Masonry.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include submittals, samples, materials, transportation, equipment, labor, preparation of surfaces for application of stone caps and veneers, installation of dovetail stone anchors and cap anchors, setting and grouting stone veneers and caps, installation of expansion joints, installation of sealants, cleaning of all finished surfaces, disposal of waste materials, application of masonry sealer and all other items required to complete the work as required in accordance with the Contract Drawings and Specifications for Stone Masonry.

END OF SECTION 44 42 80

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Contract 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 requirements for furnishing and installing one new barrier free drinking fountain complete and in place including but not limited to new ¾" water tap, with all required water provider coordination, submittals, permitting and fees, excavation, backfill and compaction, existing irrigation system protection and repair, landscape restoration to match existing, curb and gutter saw cut, removal and replacement to match existing, asphalt saw cut, removal and replacement to match existing, tapping saddle, corporation stop, curb stop, water meter, double check valve assembly copper service line and stop and waste valve, furnishing, setting (with mounting block) connection testing and adjusting of new barrier free drinking fountain, waste piping with drain sump, resetting of memorial granite ring and setting of sandstone pavers inside ring.
- B. Related Sections:
 - 1. Division 01 Section "Erosion and Sedimentation Control".
 - 2. Division 03 Section "Concrete walks, curbs and miscellaneous flatwork".

PART 2 - PRODUCTS**2.1 DRINKING FOUNTAIN**

- A. Barrier free pedestal drinking fountain Haws Model 3511 "Hi-Lo" antique, historic style heavy duty cast aluminum pedestal drinking fountain.

PART 3 - EXECUTION**3.1 MOUNTING**

- A. Install drinking fountain in conformance with all manufacturer recommendations including any required U.P.C. requirements.
- B. Installation of service line and waste piping including sump installation.
- C. Reinstallation of existing salvaged and stored commemorative granite ring sets with infill sandstone pavers.

3.2 CLEANING

- A. Clean all exposed surfaces as required to remove any surface staining or accumulated debris and dust.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. Measurement will be based on the percentage complete for the lump sum contract amount for drinking fountain.

4.2 PAYMENT

- A. Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, salvage, storage, installation and reinstallation, mounting and cleaning as required in accordance with the Contract Drawings and Specification.

END OF SECTION 44 42 90

CITY AND COUNTY OF DENVER

STATE OF COLORADO



Department of Public Works

Drawings

Contract No: 201735948



Cranmer Park Sun Dial Terrace Renovation

July 17, 2017



**CITY & COUNTY OF DENVER
DEPARTMENT OF PARKS &
RECREATION**

Cranmer Park Sun Dial Terrace Reconstruction

City Project Master Number: 2016-PROJMSTR-0000573

Date: January 15, 2017

APPROVED BY:

J. M. Benito 4/5/17
Executive Director of Public Works Date

Healy S. Sumner 4.8.17
City Engineer Date

David W. [Signature] 4/3/17
Director of Engineering Capital Projects Date

Stuart J. Harney 3-30-17
City Traffic Engineer Date

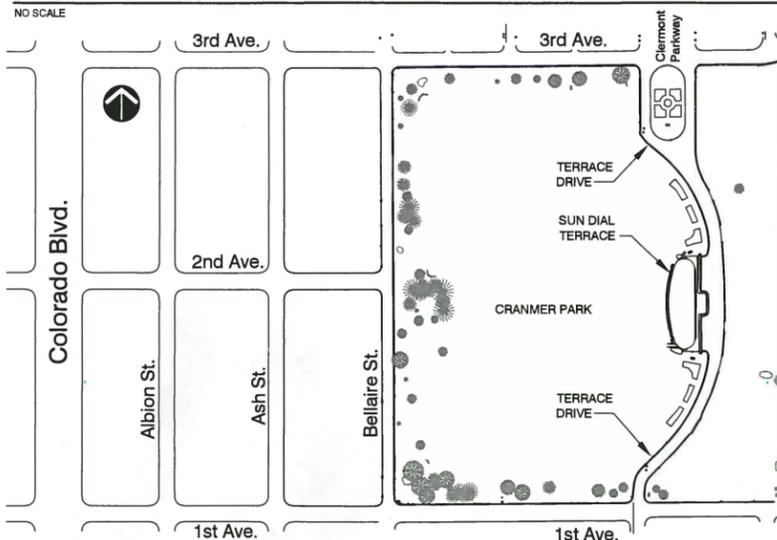
Harvey Harney
Manager of Parks and Recreation Date

DRAWING INDEX:

- Sheet No. SDT-1 - Site Survey Plan South
- Sheet No. SDT-2 - Site Survey Plan North
- Sheet No. SDT-3 - Existing Conditions and Removals Plan South
- Sheet No. SDT-4 - Existing Conditions and Removals Plan North
- Sheet No. SDT-5 - Drainage and Materials Plan South
- Sheet No. SDT-6 - Drainage and Materials Plan North
- Sheet No. SDT-7 - Layout and Grading Plan South
- Sheet No. SDT-8 - Layout and Grading Plan North
- Sheet No. SDT-9 - Landscape and Irrigation Plan South
- Sheet No. SDT-10 - Landscape and Irrigation Plan North
- Sheet No. SDT-11 - Add Alt. No.1 Drinking Fountain POC and Service Line Plan
- Sheet No. SDT-12 - Add Alt. No.1 Drinking Fountain POC Detail and Notes
- Sheet No. D1 - Detail Plan
- Sheet No. D2 - Detail Plan
- Sheet No. D3 - Detail Plan
- Sheet No. D4 - Detail Plan
- Sheet No. S1 - Structural General Notes
- Sheet No. S2 - Foundation / East - West - Step Section & Details
- Sheet No. S3 - Foundation / Handicap Ramp Partial Plan - Section Details
- Sheet No. S4 - Sun Dial Section & Plan Section Details

**100% COMPLETE CONSTRUCTION DOCUMENTS
REVIEW SET NOT FOR CONSTRUCTION**

SUN DIAL TERRACE LOCATION MAP



GENERAL NOTES:

1. ALL WORK MUST CONFORM TO THE CITY AND COUNTY OF DENVER STANDARD CONSTRUCTION SPECIFICATIONS.
2. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO @ 1-800-922-1987 FORTY EIGHT (48) HOURS PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ANY EXISTING UTILITY (INCLUDING DEPTHS) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION. ALL EXISTING UTILITIES SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR. DAMAGED UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
3. THE CONTRACTOR SHALL OBTAIN AT HIS EXPENSE ALL PERMITS WHICH ARE NECESSARY TO PERFORM THE PROPOSED WORK.
4. ALL LAND CORNERS, TIES, RANGE POINTS, AND BENCHMARKS OR OTHER SURVEY CONTROL POINTS WHICH MAY BE ENCOUNTERED DURING CONSTRUCTION MUST BE PRESERVED. A MONUMENT RECORD MUST BE FILED WITH THE CITY SURVEYOR'S OFFICE ON ALL LAND CORNERS, TIES, RANGE POINTS, BENCHMARKS, AND CROSSES SO THEY CAN BE REPLACED AFTER CONSTRUCTION BY THE CONTRACTOR'S SURVEYOR. A COLORADO LICENSED LAND SURVEYOR MUST REPLACE THESE MONUMENTS BEFORE THE CITY CAN ACCEPT NEW CONSTRUCTION. MONUMENT RECORDS MAY BE FAXED TO THE CITY SURVEYOR AT (720) 865-3280. PHONE (720) 865-3100.
5. ALL WORK IN THE RIGHT-OF-WAY WILL REQUIRE A SPECIAL PERMIT AND MUST ADHERE TO ALL CITY AND COUNTY OF DENVER STANDARDS.
6. COORDINATE ALL WORK WITH THE CITY AND COUNTY OF DENVER DEPARTMENT OF PARKS AND RECREATION PLANNING DESIGN AND CONSTRUCTION DIVISION PLANNER IN CHARGE KELLY REAM @ (720) 913-0671 AND PARKS DISTRICT SUPERINTENDENT ADAM SMITH @ (720) 865-0871.

ENVIRONMENTAL NOTES:

1. CONTRACTOR SHALL TAKE REASONABLE MEASURES TO PREVENT PARTICULATE MATTER FROM BECOMING AIRBORNE AND TO PREVENT THE VISIBLE DISCHARGE OF FUGITIVE PARTICULATE EMISSIONS BEYOND THE PROPERTY ON WHICH THE EMISSIONS ORIGINATE. THE MEASURES TAKEN MUST BE EFFECTIVE IN THE CONTROL OF FUGITIVE PARTICULATE EMISSIONS AT ALL TIMES ON THE SITE, INCLUDING PERIODS OF INACTIVITY SUCH AS EVENINGS, WEEKENDS AND HOLIDAYS AS WELL AS ANY OTHER PERIOD OF INACTIVITY.
2. DURING ANY SOIL DISTURBING ACTIVITIES, IF UNKNOWN / UNIDENTIFIED UNDERGROUND STORAGE TANKS, DRUMS, ODOROUS SOIL, STAINED SOIL, ASBESTOS-CEMENT PIPE (TRANSITE), BUILDING DEBRIS OR WASTE MATERIALS ARE ENCOUNTERED DURING THE PROJECT, CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA OF THE DISCOVERY, UNTIL DENVER ENVIRONMENTAL HEALTH (DEH) MAKES A DETERMINATION OF HOW TO PROCEED. CONTRACTOR SHALL IMMEDIATELY NOTIFY DEH OF THE DISCOVERY VIA THE PHONE NUMBER 720-460-1706.
3. ANY FILL MATERIAL OR SOILS TO BE MOVED TO AND PLACED ON CCD-OWNED PROPERTY OR PLACED ON REAL PROPERTY TO BE TRANSFERRED TO THE CCD MUST BE FREE OF KNOWN CONTAMINATION (OBSERVED AND DOCUMENTED OR PREVIOUSLY DOCUMENTED) AND BE ACCEPTABLE FOR UNRESTRICTED RESIDENTIAL USE. CONTACT DAVE ERICKSON, DENVER ENVIRONMENTAL HEALTH (720-865-5433) FOR CLARIFICATION, IF NEEDED, REGARDING THIS CCD REQUIREMENT.
4. THE CONTRACTOR SHALL DIRECT NON-RECYCLABLE, NON-HAZARDOUS WASTES FROM CCD-OWNED OR CONTROLLER PROPERTY OR FACILITIES TO THE DENVER ARAPAHOE DISPOSAL SITE (DADS) LANDFILL FOR DISPOSAL, FOLLOWING THE REQUIREMENT AND PROCEDURAL GUIDANCE IN CCD EXECUTIVE ORDER 115.
5. NOISE CONTROL. EXEMPTED HOURS FOR CONSTRUCTION IN THE CITY AND COUNTY OF DENVER ARE FROM 7 A.M. TO 9 P.M. MONDAY THROUGH FRIDAY AND 8 A.M. TO 5 P.M. ON SATURDAYS AND SUNDAYS PER SECTIONS 36-6(B)(7) AND 36-7(5)(A), B AND C. OF DENVER'S NOISE ORDINANCE, CHAPTER 36 NOISE CONTROL, DENVER REVISED MUNICIPAL CODE (DRMC). IF THERE IS AN ANTICIPATED NEED TO WORK OUTSIDE OF THE EXEMPTED HOURS FOR CONSTRUCTION: 1) THE CONTRACTOR WILL NEED TO MAKE A REQUEST FOR A NIGHTTIME NOISE VARIANCE AS ALLOWED FOR IN SECTION 36-7(5)(C) OF THE DRMC AND 2) THE VARIANCE PROCESS NEEDS TO BE STARTED A MINIMUM OF THREE MONTHS PRIOR TO THE DESIRED START DATE OF ANY WORK NEEDING TO OCCUR OUTSIDE EXEMPTED HOURS. ANY NOISE VARIANCE QUESTIONS SHOULD BE DIRECTED TO PAUL RIEDESEL, DEPARTMENT OF ENVIRONMENTAL HEALTH, DENVER COMMUNITY NOISE PROGRAM, (PHONE 720-865-5410; FAX 720-865-5532) A MINIMUM OF THREE MONTHS PRIOR TO THE START OF THE PROJECT.

CITY AND COUNTY OF DENVER EROSION CONTROL NOTES:

- THE OWNER, SITE DEVELOPER, CONTRACTOR AND / OR THEIR AUTHORIZED AGENTS SHALL ENSURE THAT ALL POTENTIAL POLLUTANTS GENERATED DURING DEMOLITION OR CONSTRUCTION WORK ASSOCIATED WITH THIS PROJECT, BE PREVENTED FROM DISCHARGE TO STREAMS, WETLANDS OR ANY WATER BODY IN THE VICINITY OF THE THIS PROJECT SITE IN ACCORDANCE WITH THE FOLLOWING:
1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND OR / THEIR AUTHORIZED AGENTS SHALL PREVENT SEDIMENT, DEBRIS AND ALL OTHER POLLUTANTS FROM ENTERING THE WATERWAY DURING ALL DEMOLITION, EXCAVATION, TRENCHING, BORING, GRADING, OR OTHER CONSTRUCTION OPERATIONS THAT ARE PART OF THIS PROJECT. THE OWNER, SITE DEVELOPER, CONTRACTOR AND / OR THEIR AUTHORIZED AGENTS SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM, RECEIVING WATERS, WATERWAYS, WETLANDS, AND OR OTHER PUBLIC OR PRIVATE PROPERTIES.
 2. THE OWNER, SITE DEVELOPER, CONTRACTOR AND / OR THEIR AUTHORIZED AGENT SHALL REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO OR, ACCUMULATE IN THE FLOW LINES OF STORM DRAINAGE APPURTENANCES, AND PUBLIC RIGHTS OF WAYS OF THE CITY AND COUNTY OF DENVER, AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT. ALL REMOVALS SHALL BE CONDUCTED IN A TIMELY MANNER.
 3. THE OWNER, SITE DEVELOPER, CONTRACTOR AND / OR THEIR AUTHORIZED AGENTS SHALL INSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THIS SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF MATERIAL DURING TRANSPORT ON PUBLIC RIGHTS OF WAY. (SEC.49-552; REVISED MUNICIPAL CODE)
 4. THE USE OF REBAR TO ANCHOR BEST MANAGEMENT PRACTICES, OTHER THAN PORTABLE TOILETS, IS PROHIBITED.
 5. THE OWNER, SITE DEVELOPER, CONTRACTOR AND / OR THEIR AUTHORIZED AGENTS SHALL IMPLEMENT THE FOLLOWING BEST MANAGEMENT PRACTICES (BMP'S) ON SITE DURING CONSTRUCTION:
 - I. VEHICLE TRACKING CONTROL: THIS BMP IS REQUIRED AT ALL ACCESS POINTS FOR INGRESS / EGRESS FROM OFF-SITE IMPERVIOUS SURFACES TO CONSTRUCTION SITE PERVIOUS AREAS THAT ARE USED BY VEHICULAR TRAFFIC OF CONSTRUCTION EQUIPMENT.
 - II. INLET PROTECTION: THIS BMP IS REQUIRED ON ALL EXISTING OR PROPOSED STORM SEWER INLETS IN THE VICINITY OF THE CONSTRUCTION SITE THAT MAY RECEIVE SITE RUNOFF. THE BMP MUST BE APPROPRIATE TO THE TYPE OF STORM INLET AND APPROPRIATE FOR THE GROUND SURFACE AT THE INLET.
 - III. INTERIM SITE STABILIZATION: THIS BMP IS REQUIRED TO PROVIDE A MEASURE FOR PREVENTING THE DISCHARGE OF SEDIMENT FROM CONSTRUCTION SITES WHERE OVER LOT GRADING OR OTHER SITE DISTURBANCE HAS OCCURRED. THIS BMP IS PARTICULARLY NECESSARY ON SITES WHERE CONSTRUCTION ACTIVITIES / DISTURBANCE WILL BE LIMITED TO SMALL AREAS OF THE PROJECT SITE. ACCEPTABLE BMP'S INCLUDE:
 - a) PRESERVING EXISTING VEGETATION
 - b) SEEDING AND PLANTING
 - c) MULCHING
 - d) MULCHING AND SEEDING
 - e) TEMPORARY / PERMANENT RE-VEGETATION OPERATIONS
 - f) CHEMICAL SOIL STABILIZER APPLICATIONS (REQUIRES WMD APPROVAL)
 - IV. WASTE MANAGEMENT / CONTAINMENT: THIS BMP REQUIRES THAT ALL CONSTRUCTION WASTES, FUELS, LUBRICANTS, CHEMICAL WASTES, TRASH, SANITARY WASTES, CONTAMINATED SOILS OR DEBRIS SHALL BE CONTAINED ON SITE, PROTECTED FROM CONTACT WITH PRECIPITATION OR SURFACE RUNOFF, PERIODICALLY REMOVED FROM THE CONSTRUCTION SITE, AND PROPERLY DISPOSED OF.
 - V. SPILL PREVENTION CONTAINMENT: THIS BMP DEFINES THE MEASURES PROPOSED FOR PREVENTING, CONTROLLING, OR CONTAINING SPILLS OF FUEL, LUBRICANTS, OR OTHER POLLUTANTS; AND PROTECTING POTENTIAL POLLUTANTS FROM CONTACT WITH PRECIPITATION OR RUNOFF.
 - VI. CHUTE WASHOUT CONTAINMENT: WATER USED IN THE CLEANING OF CEMENT TRUCK DELIVERY CHUTES SHALL BE DISCHARGED INTO A PREDEFINED, BERMED CONTAINMENT AREA OF THE JOB SITE. THE REQUIRED CONTAINMENT AREA IS TO BE BERMED SO THAT WASH WATER IS TOTALLY CONTAINED. WASH WATER DISCHARGED INTO THE CONTAINMENT AREA SHALL BE ALLOWED TO INFILTRATE OR EVAPORATE. DRIED CEMENT WASTE IS TO BE REMOVED FROM THE CONTAINMENT AREA AND PROPERLY DISPOSED OF.
 - a) THE DIRECT OR INDIRECT DISCHARGE OF WATER CONTAINING WASTE CEMENT TO THE STORM SEWER SYSTEM IS PROHIBITED (SEC.56-102a, c; REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).
 - VII. SWEEPING: THIS BMP REQUIRES THAT SURFACES WHICH ARE ADJACENT TO OR CONTAINED WITHIN CONSTRUCTION SITES BE SWEEPED ON A DAILY BASIS OR AS NEEDED DURING THE DAY WHEN SEDIMENT AND OTHER MATERIALS ARE TRACKED OR DISCHARGED ONTO THEM. EITHER SWEEPING BY HAND OR USE OF STREET SWEEPERS IS ACCEPTABLE. STREET SWEEPERS USING WATER WHILE SWEEPING IS PREFERRED IN ORDER TO MINIMIZE DUST. FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED.
 - IX. STOCK PILES: SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE PROTECTED FROM WIND AND WATER EROSION WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. STABILIZATION OF STOCKPILES LOCATED WITHIN 100 FEET OF RECEIVING WATERS, OR WITH SLOPES 3 TO 1 OR GREATER SHALL BE COMPLETED WITHIN SEVEN (7) DAYS FOLLOWING STOCKPILE CONSTRUCTION. STABILIZING AND PROTECTION OF STOCKPILE MAY BE ACCOMPLISHED BY ANY OF THE FOLLOWING: MULCHING, TEMPORARY / PERMANENT REVEGETATION OPERATIONS, CHEMICAL SOIL STABILIZER APPLICATION (REQUIRES DENVER PUBLIC WORKS APPROVAL), OR EROSION CONTROL MATTING / GEOTEXTILES. IF STOCKPILES ARE LOCATED WITHIN 100 FEET OF RECEIVING WATERS, A DRAINAGEWAY OR THE SITE PERIMETER, ADDITIONAL SEDIMENT CONTROLS SHALL BE REQUIRED.
 - X. SAW CUTTING OPERATIONS: THE CONTRACTOR SHALL PROTECT ALL STORM SEWER FACILITIES ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING, OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS OR AS NEEDED THROUGHOUT THE WORK DAY. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE STORM SEWER SYSTEM IS PROHIBITED (SEC.56-102a, c; REVISED MUNICIPAL CODE CITY AND COUNTY OF DENVER).
 - XI. STRUCTURAL CONTROLS: DEVELOPMENT SITES THAT ARE REQUIRED TO PROVIDE DETENTION AND WATER QUALITY ENHANCEMENT FACILITIES FOR STORM RUNOFF NEED TO INSTALL THE DETENTION FACILITIES EARLY IN THE CONSTRUCTION BUILD-OUT OF THE SITE. PROJECTS THAT ARE USING UNDERGROUND DETENTION ARE REQUIRED TO INSTALL A PRETREATMENT STRUCTURE(S) OR SEDIMENTATION BASIN(S) AS A MEANS OF TREATING POTENTIALLY POLLUTED STORM WATER PRIOR TO ENTERING THE DETENTION STRUCTURE. USE OF THESE STRUCTURES IS REQUIRED FOR ENTRAPPING SEDIMENT AND CONSTRUCTION DEBRIS DURING THE ACTIVE CONSTRUCTION PHASE OF THE PROJECT. A NARRATIVE SECTION OF THE MANAGEMENT PLAN SHOULD ADDRESS OPERATION AND MAINTENANCE OF THE STRUCTURAL CONTROLS BEING USED AS AN ACTIVE CONSTRUCTION BMP.
 6. EROSION AND SEDIMENT CONTROL 'BEST MANAGEMENT PRACTICES' SHALL BE MAINTAINED AND BE KEPT IN EFFECTIVE OPERATING CONDITION FOR THE DURATION OF THE PROJECT. ALL NECESSARY MAINTENANCE AND REPAIR SHALL BE COMPLETED IMMEDIATELY UPON DISCOVERY OF ANY DEFICIENCY OR DEFECT.



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE:
Cover Sheet

PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

CHECKED BY: MEH

DATE: 01-15-17

REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NUMBER: CS



Know what's below
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Denver Parks + Recreation

SHEET TITLE:
Site Survey Plan South

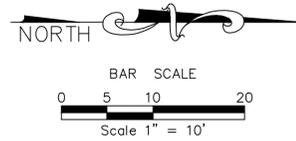
PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:	2016-PROJMSTR-0000573
SCALE:	N.A.
DESIGNED BY:	ADS
DRAWN BY:	ADS
CHECKED BY:	MEH
DATE:	01-15-17
REVISIONS:	02-15-17 02-20-17
PREPARED BY:	<i>Applied Design Services</i> 9721 Bayou Ridge Trail Parker, Colorado 80134 (303) 841-7077 Fax - 841-8191
SHEET NO.:	SDT-1

Vigil Land Consultants

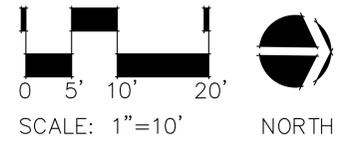
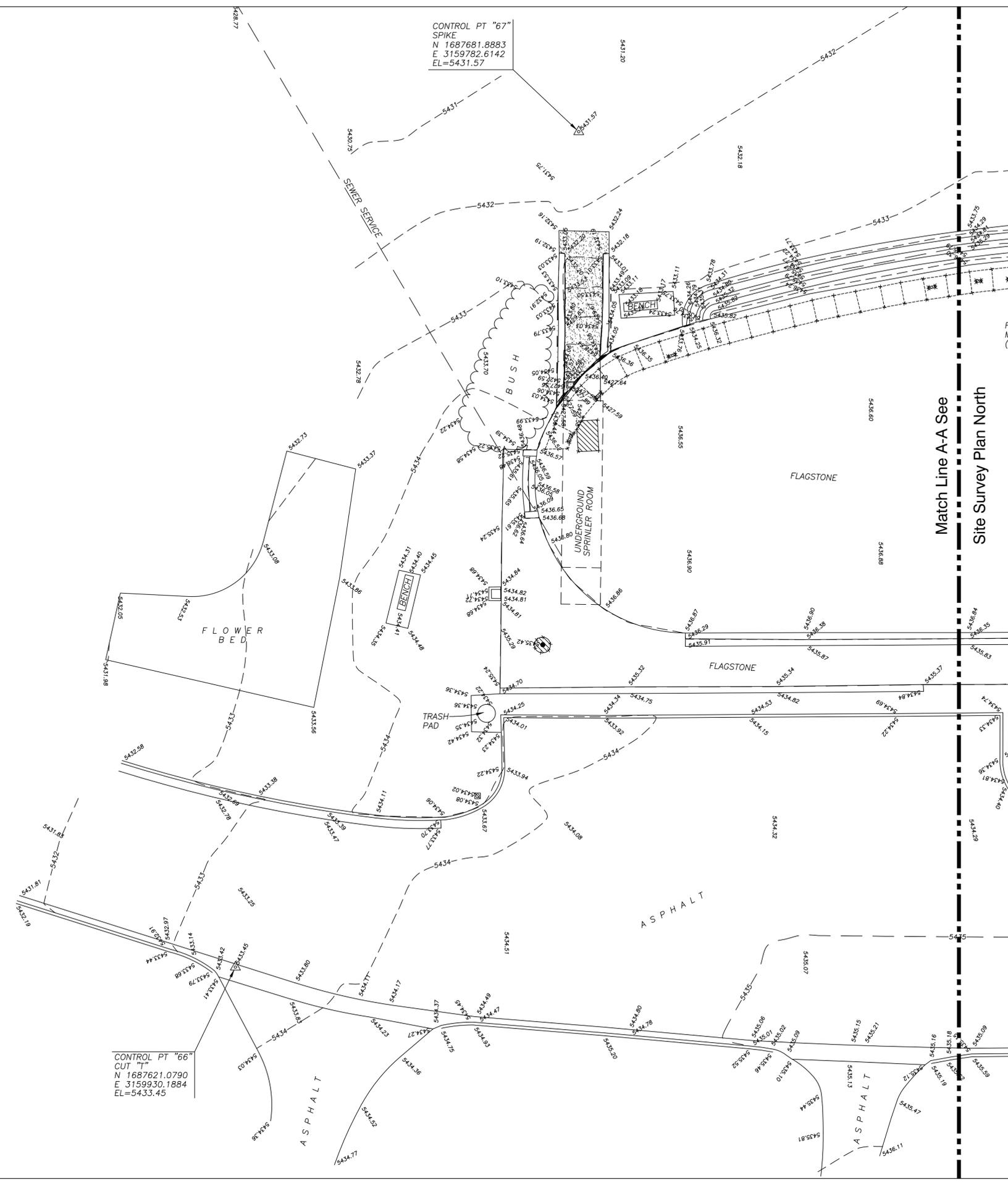
480 Yuma Street ■ Denver, Colorado 80204
Off: (303) 436-9233 ■ Fax: (303) 436-9235

- LEGEND**
- SIGN
 - IRRIGATION CONTROL BOX
 - WATER VALVE
 - SANITARY MANHOLE
 - LIGHT POLE
 - POST



GENERAL NOTES:

1. NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
2. BENCHMARK #429: CITY AND COUNTY OF DENVER BRASS CAP ON TOP OF CURB LOCATED AT THE SOUTHEAST CORNER OF DAHLIA STREET AND 1st AVENUE. NAVD 1988 DATUM, ELEVATION=5435.07.
3. VIGIL LAND CONSULTANTS INC. DOES NOT ASSUME RESPONSIBILITY FOR THE LOCATION OF BURIED UTILITIES. THE UTILITIES SHOWN WERE PLOTTED FROM MAPS PROVIDED BY THE SERVICING ENTITY AND FIELD VERIFIED ABOVE GROUND WHERE VISIBLE.
4. COMMUNICATIONS CABLES SUCH AS TELEPHONE AND CABLE TV MAY EXIST ON OR NEAR THIS PROJECT. MAPS WERE NOT AVAILABLE FROM THE SERVICING ENTITY FOR THESE UTILITIES.
5. COLORADO LAW REQUIRES ANYONE DIGGING, GRADING OR EXCAVATING TO OBTAIN A FIELD LOCATE OF ALL BURIED UTILITIES PRIOR TO CONSTRUCTION.
6. THE COORDINATE SYSTEM USED FOR THIS SURVEY IS A MODIFIED GROUND LEVEL VERSION OF THE COLORADO STATE PLANE SYSTEM, CENTRAL ZONE NAD 1983/92, USE THE RECIPROCAL OF THE COMBINED SCALE FACTOR OF 1.000259173 TO OBTAIN GRID LEVEL STATE PLANE COORDINATES.



CONTROL PT "66"
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CONTROL PT "67"
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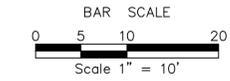
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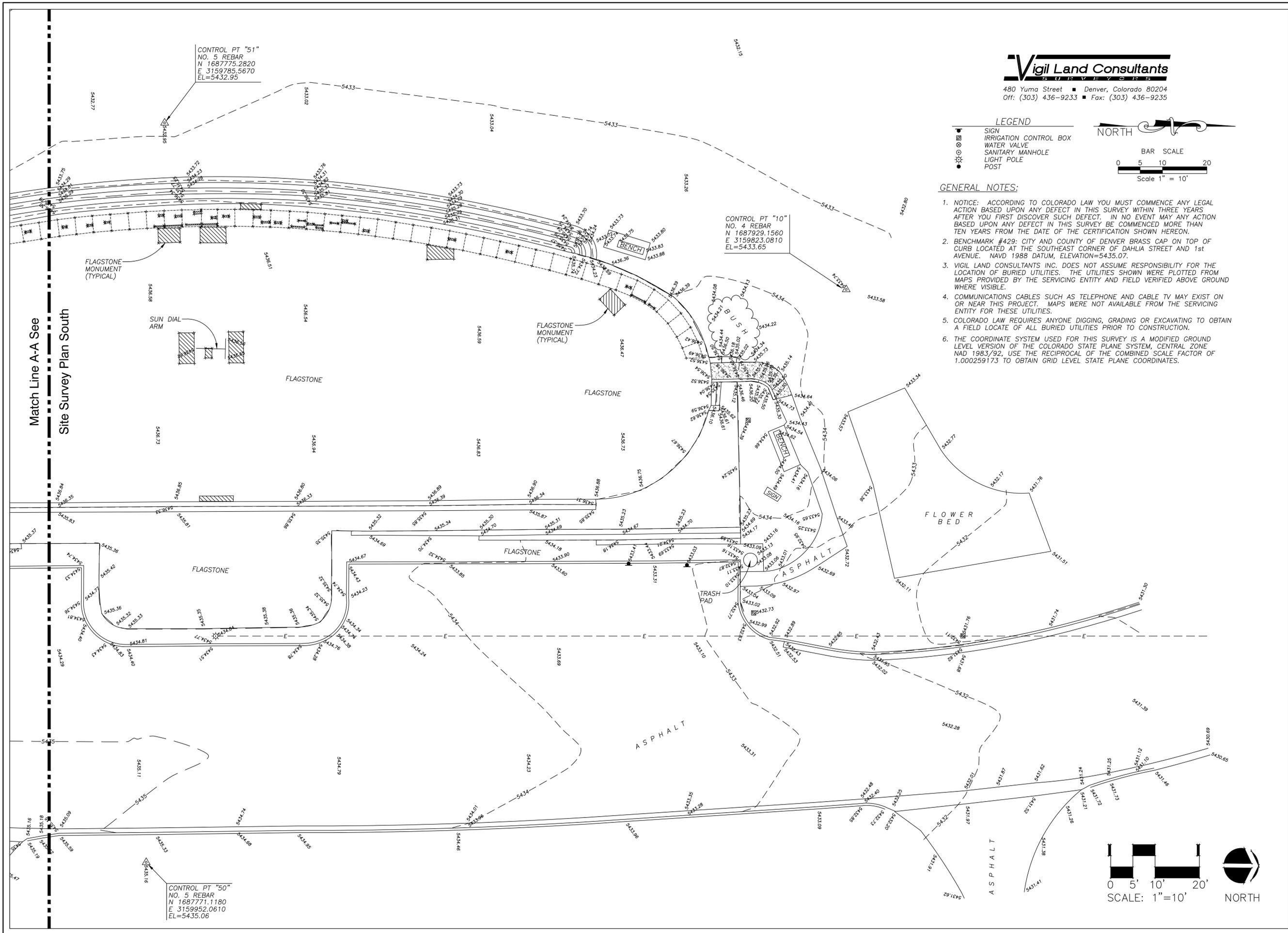
- LEGEND**
- SIGN
 - IRRIGATION CONTROL BOX
 - WATER VALVE
 - SANITARY MANHOLE
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 - POST

NORTH



GENERAL NOTES:

1. NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
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3. VIGIL LAND CONSULTANTS INC. DOES NOT ASSUME RESPONSIBILITY FOR THE LOCATION OF BURIED UTILITIES. THE UTILITIES SHOWN WERE PLOTTED FROM MAPS PROVIDED BY THE SERVICING ENTITY AND FIELD VERIFIED ABOVE GROUND WHERE VISIBLE.
4. COMMUNICATIONS CABLES SUCH AS TELEPHONE AND CABLE TV MAY EXIST ON OR NEAR THIS PROJECT. MAPS WERE NOT AVAILABLE FROM THE SERVICING ENTITY FOR THESE UTILITIES.
5. COLORADO LAW REQUIRES ANYONE DIGGING, GRADING OR EXCAVATING TO OBTAIN A FIELD LOCATE OF ALL BURIED UTILITIES PRIOR TO CONSTRUCTION.
6. THE COORDINATE SYSTEM USED FOR THIS SURVEY IS A MODIFIED GROUND LEVEL VERSION OF THE COLORADO STATE PLANE SYSTEM, CENTRAL ZONE NAD 1983/92, USE THE RECIPROCAL OF THE COMBINED SCALE FACTOR OF 1.000259173 TO OBTAIN GRID LEVEL STATE PLANE COORDINATES.



Denver Parks + Recreation

SHEET TITLE:
Site Survey Plan North

PROJECT:
Cranmer Park Sun Dial Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

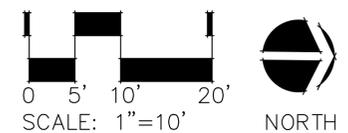
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REVISIONS:
02-15-17
02-20-17

PREPARED BY:
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9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO: SDT-2





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HATCH/SYMBOL:	DESCRIPTION OF REMOVAL ITEM:
	EXISTING ASPHALT PAVEMENT. SAW CUT AND REMOVE EXISTING ASPHALT PAVEMENT INCLUDING ANY GEOTEXTILE AND STEEL EDGES AND DISPOSE OF OFF SITE. ASSUME FOR THE PURPOSE OF BIDDING THAT EXISTING ASPHALT AVERAGES 6" THICK.
	EXISTING BLUE GRASS TURF. STRIP AND REMOVE EXISTING BLUE GRASS TURF AND TOP 2" OF SOIL TO ACCOMMODATE CONSTRUCTION ACCESS, MATERIAL STORAGE AND FORM ERECTION. DISPOSE OF SOD AND SOIL OFF SITE. SCARIFY COMPACTED AREAS 6" DEEP. IMPORT, PLACE, COMPACT AND FINE GRADE NEW PRE MANUFACTURED SANDY LOAM TOPSOIL MINIMUM DEPTH 2" IN ALL AREAS TO RECEIVE NEW SOD.
	EXISTING CONCRETE SLABS, WALK OR RAMP. BREAK, REMOVE AND DISPOSE OF EXISTING CONCRETE SLABS, WALKS AND RAMPS OFF SITE. ASSUME FOR THE PURPOSE OF BIDDING THAT EXISTING CONCRETE IS 6" THICK, 4,000 POUND, FIBER MESH REINFORCED SLAB ON GRADE. IMPORT PLACE AND COMPACT SOIL TO FILL ANY VOIDS LEFT FROM SLAB REMOVAL.
	EXISTING 6" STEEL BENCH WITH BACK. SALVAGE, STORE AND REINSTALL BENCH AND COMMEMORATIVE PLAQUES OR SIGNAGE.
	EXISTING 35 GAL. STEEL TRASH RECEPTACLE. AND 50 GAL. TRASH BARREL. SALVAGE AND DELIVER TO OWNER. REMOVE AND DISPOSE OF SAND STONE PADS OFF SITE.
	EXISTING DRINKING FOUNTAIN. SALVAGE AND STORE NOZZLE, BOWL, STEEL COLUMN, ANY INTERNAL WASTE OR SUPPLY MECHANISM AND ROSE GRANITE SLEEVE AND COMMEMORATIVE ROSE GRANITE BASE RING PER DETAIL F/D1.
	INTERPRETIVE SAND STONE PANELS INCLUDING FIVE HISTORIC TEXT PANELS LOCATED ALONG TERRAZZO PANORAMA, TWO ANALEMMA TABLETS LOCATED AT THE SUNDIAL AND ONE COMMEMORATIVE PANEL LOCATED UNDER THE SUN DIAL. CONTRACTOR TO PHOTOGRAPHICALLY DOCUMENT EXISTING TEXT PRIOR TO REMOVAL. CONTRACTOR TO PHYSICALLY DOCUMENT EXISTING TEXT PRIOR TO REMOVAL BY RUBBING OF ENTIRE PANEL ON 3 MILL. MYLAR. THOROUGHLY RECORD EXISTING TEXT INCLUDING TEXT CONTENT, SIZE AND FONT, FOR ETCHING OF REPLACEMENT PANELS. CAREFULLY REMOVE STONES TO MINIMIZE CRACKING AND TRANSPORT TO ERICKSON MONUMENTS 1245 QUIVAS ST. DENVER, COLORADO 80203 (303)-571-5151. CONTRACTOR TO PICK UP ROSE GRANITE REPLACEMENT PANELS FROM ERICKSON MONUMENTS, TRANSPORT TO THE PROJECT SITE AND REINSTALL AT EXISTING LOCATIONS. THE COST TO FURNISH AND ETCH REPLACEMENT ROSE GRANITE PANELS BY ERICKSON MONUMENTS IS TO BE INCLUDED AS PART OF THE TERRAZZO RECONSTRUCTION BASE BID CONTRACT. REPLACEMENT PANELS ARE TO BE 2 1/2" THICK FLAME FINISHED ROSE GRANITE AND ARE TO MATCH THE EXISTING PANORAMA MARKER STONES IN COLOR AND FINISH.
	INTERPRETIVE SAND STONE PERIMETER / CAP STONES. SALVAGE, REMOVE ALL EXISTING SURFACE GROUT RESIDUE, STORE AND REINSTALL TO MATCH EXISTING TYPICAL FOUR PERIMETER CAP STONES.
	EXISTING ROSE GRANITE PANORAMA MARKER STONES SET IN EXISTING TERRAZZO FRONT RANGE PANORAMA. DOCUMENT LOCATIONS AND TEXT. SALVAGE, CLEAN, STORE AND REINSTALL TO MATCH EXISTING TYP. 33.
	EXISTING FOUR COLOR RUSTIC TERRAZZO COLORADO FRONT RANGE PANORAMA. DOCUMENT EXISTING DIVIDER CONFIGURATION AT FULL SCALE USING PERMANENT MARKERS AND 3 MILL. MATTE FINISH MYLAR. REMOVE EXISTING TERRAZZO, DIVIDER STRIPS, PERIMETER EXPANSION JOINTS, 4" THICK CONCRETE BASE AND DISPOSE OF OFF SITE.
	EXISTING 7" DIAMETER BY 8" THICK SAND STONE SUNDIAL WITH 3" DIA. STAINLESS STEEL GNOMON SUPPORT ROD. CONTRACTOR TO: REMOVE, LOAD AND TRANSPORT THE SUNDIAL TO CAMP STONE 3700 W. 69th PL., WESTMINSTER, COLORADO 80030 (303) 428-9545 FOR RE-FACING, RELOAD THE SUNDIAL AND TRANSPORT FROM CAMP STONE TO ERICKSON MONUMENTS 1245 QUIVAS ST. DENVER, COLORADO 80203 (303) 571-5151 FOR RESTORATION AND RE-CUTTING, RELOAD AND TRANSPORT THE SUNDIAL FROM ERICKSON MONUMENTS TO THE SITE AFTER RESTORATION AND RE-CUTTING ARE COMPLETE. CONTRACTOR TO RESET THE SUNDIAL ON THE TERRAZZO PER DRAWINGS AND SPECIFICATIONS. ALL COSTS ASSOCIATED WITH THE RE-FACING, RESTORATION AND RE-CUTTING OF THE SUN DIAL (INCLUDING HANDLING AND TRANSPORTATION) ARE TO BE INCLUDED AS PART OF THE BASE BID TERRAZZO RECONSTRUCTION CONTRACT.
	EXISTING UPPER TERRAZZO SQUARE CUT RANDOM ASHLAR PATTERN SAND STONE FIELD PAVERS WITH 1" PLUS MORTARED JOINTS. PAVERS ARE MORTARED TO A 6" TO 8" THICK CONCRETE SLAB WITH WOVEN WIRE REINFORCING. PAVERS AVERAGE 2" THICKNESS. CONTRACTOR TO SALVAGE AND STORE SELECT STONES (IDENTIFIED BY OWNERS) FOR PICK UP BY OWNER. ASSUME FOR THE PURPOSE OF BIDDING THAT 20% OF THE STONES ARE TO BE SALVAGED AND STORED ON SITE. ALL REMAINING STONES ARE TO BE DISPOSED OF OFF SITE.
	EXISTING LOWER PLAZA RANDOM PATTERN SNAPPED FACE SAND STONE FIELD PAVERS WITH 1" PLUS MORTARED JOINTS. PAVERS ARE MORTARED TO A 6" TO 8" THICK CONCRETE SLAB WITH WOVEN WIRE REINFORCING. PAVERS AVERAGE 2" THICKNESS. REMOVE ALL PAVERS AND DISPOSE OF OFF SITE.

DETAILED REMOVAL SPECIFICATION:

- UTILITY VAULT:**
UTILITY VAULT DEMOLITION AND REMOVAL TO BE COMPLETE AND IN PLACE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- 1) LOCATION, EXCAVATION, CAPPING AND TERMINATION OF THE EXISTING PRIVATE SANITARY SEWER IN CONFORMANCE WITH ALL UTILITY PROVIDER, U.P.C. AND LOCAL PLUMBING CODE STANDARDS AND SPECIFICATIONS.
 - 2) LOCATION, EXCAVATION, CAPPING AND TERMINATION OF THE EXISTING PRIVATE AREA DRAIN LINE IN CONFORMANCE WITH ALL UTILITY PROVIDER AND LOCAL BUILDING CODE STANDARDS AND SPECIFICATIONS.
 - 3) TRACING, LOCATION AND TERMINATION OF THE EXISTING ELECTRICAL SERVICE IN CONFORMANCE WITH ALL N.E.C. AND LOCAL BUILDING CODE AND UTILITY PROVIDER REQUIREMENTS.
 - 4) REMOVAL AND DISPOSAL OF ALL SURFACE MOUNTED ELECTRICAL FIXTURES, CONDUIT, ELECTRIC METER, METER HOUSING AND ALL MISCELLANEOUS FITTINGS CONNECTORS AND SUPPORTS.
 - 5) REMOVAL AND DISPOSAL OF ALL PLUMBING FIXTURES (INCLUDING TOILET) AND ALL SURFACE MOUNTED PIPING INCLUDING ALL MISCELLANEOUS FITTINGS CONNECTORS AND SUPPORTS.
 - 6) REMOVAL AND DISPOSAL OF CONCRETE VENT TUNNEL AND VENT DAYLIGHT INCLUDING GRATE AND CONCRETE FRAME.
 - 7) REMOVAL AND DISPOSAL OF ALL TRASH LUMBER AND ANY OTHER ACCUMULATED DEBRIS.
 - 8) REMOVAL AND DISPOSAL OF HOLLOW METAL ENTRY DOOR, DOOR FRAME, AND THRESHOLD.
 - 9) REMOVAL AND DISPOSAL OF CONCRETE ENTRY RAMP, INCLUDING SAND STONE WING WALLS.
 - 10) SALVAGE, DISASSEMBLY AND DELIVERY OF EXISTING STEEL RAILING TO OWNER.
 - 11) REMOVAL AND DISPOSAL OF AREA DRAIN INCLUDING GRATE FRAME AND BASIN.
 - 12) DEMOLITION, REMOVAL AND DISPOSAL OF THE EXISTING CONCRETE VAULT ROOF. ASSUME ROOF THICKNESS IS 8" WITH TWISTED WIRE FABRIC.
 - 13) DEMOLITION, REMOVAL AND DISPOSAL OF THE EXISTING CONCRETE VAULT WALLS. ALL BROKEN CONCRETE TO BE REMOVED AND DISPOSED OF OFF SITE. ASSUME SIDE WALLS ARE 8" THICK WITH TWISTED WIRE REINFORCEMENT.
 - 14) DEMOLITION, REMOVAL AND DISPOSAL OF THE EXISTING CONCRETE VAULT FLOOR. ASSUME VAULT FLOOR IS 8" THICK WITH TWISTED WIRE REINFORCEMENT.
 - 15) REMOVE AND DISPOSE OF WET WELL LID AND FILL WITH 3/4" CRUSHED ROCK. FILL REMAINDER OF EXCAVATION CREATED BY VAULT REMOVAL WITH CLASS 1 STRUCTURAL FILL AND COMPACT TO 95% S.P.D. PER ASTM D-698 IN 12" LIFTS.

DETAILED REMOVAL SPECIFICATION:

SUB GRADE REMOVAL AND DISPOSAL:
SUB GRADE REMOVAL IS TO BE COMPLETE AND IN PLACE INCLUDING THE REMOVAL AND DISPOSAL OF ALL MATERIAL ENCOUNTERED REGARDLESS OF COMPOSITION TO THE LINES AND GRADES INDICATED. SEE DETAILED REMOVAL NOTES AND TEST PIT INVESTIGATION INFORMATION ON SHEET SDT-4.

PARK IMPACT MITIGATION:
CRAMMER PARK IS CONSIDERED TO BE A PRECIOUS RESOURCE TO THE RESIDENTS OF THE HILL TOP COMMUNITY. IT IS IMPERATIVE TO THE OWNER THAT THE SUN DIAL TERRACE RESTORATION BE COMPLETED WITHOUT ANY NEGATIVE IMPACT TO THE PARK RESOURCE OR INCONVENIENCE FOR THE PARK USERS OUTSIDE OF THE LIMIT OF WORK. INCLUDING AT A MINIMUM THE FOLLOWING CONSTRUCTION IMPACT MITIGATION MEASURES:

- 1) PERIMETER CHAIN LINK FENCING AND GREEN PRIVACY SCREENING ARE TO BE ADJUSTED AND RESET DAILY. ACCESS GATES ARE TO REMAIN CLOSED DURING CONSTRUCTION AND OPENED ONLY FOR DELIVERIES AND HAUL OFF OPERATIONS.
- 2) CONTRACTOR IS RESPONSIBLE FOR ALL PEDESTRIAN AND VEHICULAR TRAFFIC CONTROL DURING CONSTRUCTION.
- 3) STREETS ARE TO BE SWEEPED AND WASHED DAILY. ABSOLUTELY NO MUD WILL BE ALLOWED ON TERRACE DRIVE.
- 4) FUGITIVE DUST MUST BE MANAGED EFFECTIVELY THROUGHOUT CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ADDITIONAL WATER AS REQUIRED FOR DUST ABATEMENT AND STREET WASHING.
- 5) CONSTRUCTION EQUIPMENT MUST REMAIN WITHIN THE LIMIT OF WORK. PARKING OF CONSTRUCTION EQUIPMENT ON TERRACE DRIVE (DAY OR NIGHT) WILL NOT BE PERMITTED.
- 6) ALL MATERIAL STORAGE IS TO BE WITHIN THE LIMIT OF WORK. NO MATERIAL STORAGE OUTSIDE OF THE LIMIT OF WORK WILL BE ALLOWED.

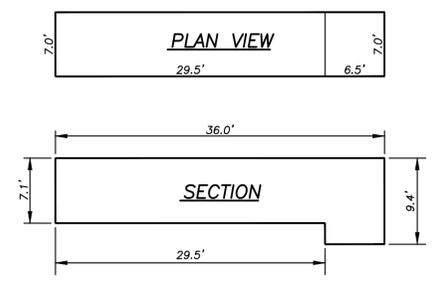
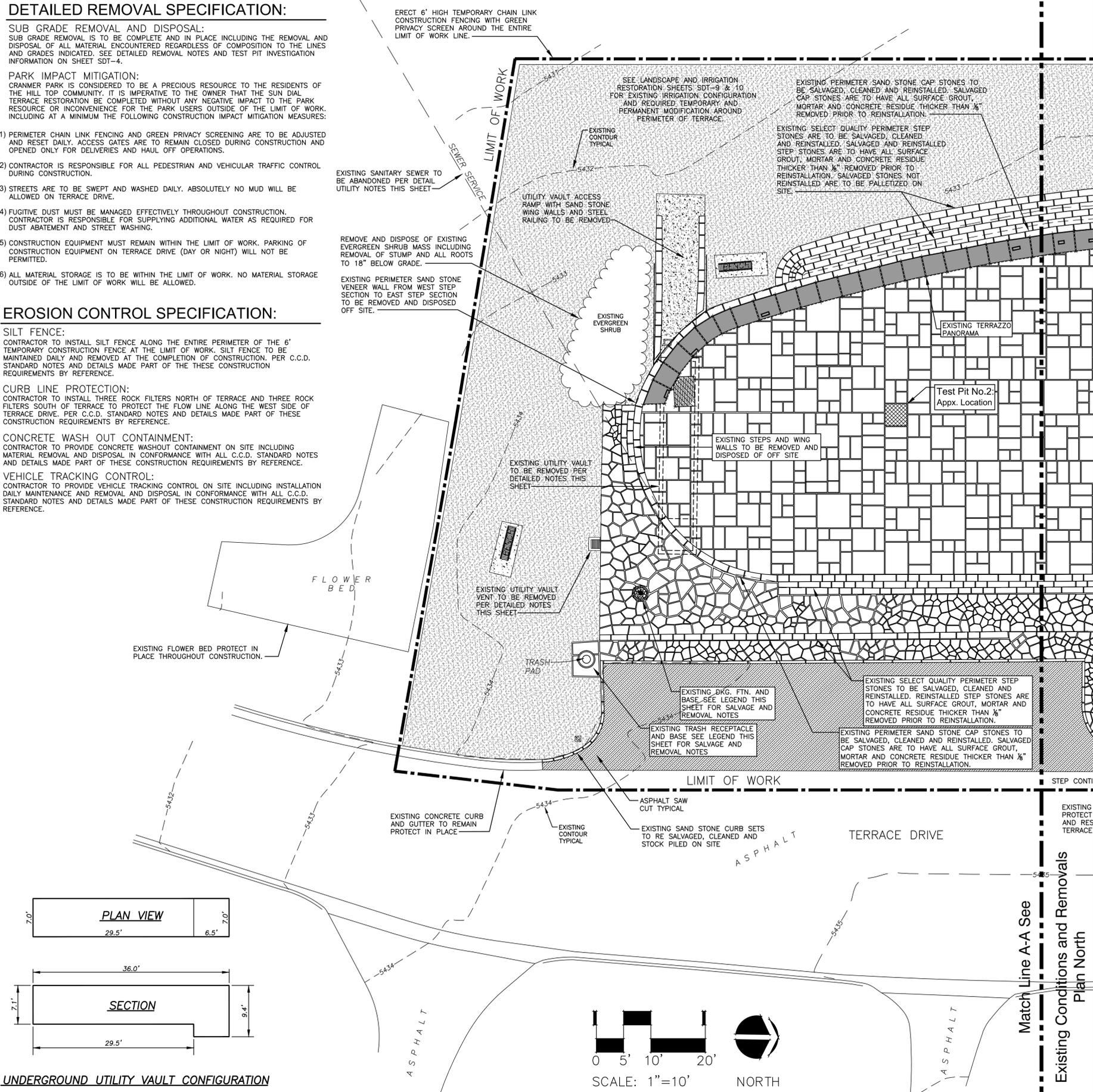
EROSION CONTROL SPECIFICATION:

SILT FENCE:
CONTRACTOR TO INSTALL SILT FENCE ALONG THE ENTIRE PERIMETER OF THE 6' TEMPORARY CONSTRUCTION FENCE AT THE LIMIT OF WORK. SILT FENCE TO BE MAINTAINED DAILY AND REMOVED AT THE COMPLETION OF CONSTRUCTION. PER C.C.D. STANDARD NOTES AND DETAILS MADE PART OF THESE CONSTRUCTION REQUIREMENTS BY REFERENCE.

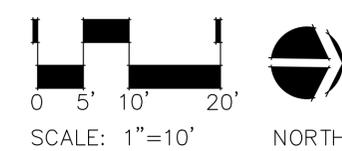
CURB LINE PROTECTION:
CONTRACTOR TO INSTALL THREE ROCK FILTERS NORTH OF TERRACE AND THREE ROCK FILTERS SOUTH OF TERRACE TO PROTECT THE FLOW LINE ALONG THE WEST SIDE OF TERRACE DRIVE. PER C.C.D. STANDARD NOTES AND DETAILS MADE PART OF THESE CONSTRUCTION REQUIREMENTS BY REFERENCE.

CONCRETE WASH OUT CONTAINMENT:
CONTRACTOR TO PROVIDE CONCRETE WASHOUT CONTAINMENT ON SITE INCLUDING MATERIAL REMOVAL AND DISPOSAL IN CONFORMANCE WITH ALL C.C.D. STANDARD NOTES AND DETAILS MADE PART OF THESE CONSTRUCTION REQUIREMENTS BY REFERENCE.

VEHICLE TRACKING CONTROL:
CONTRACTOR TO PROVIDE VEHICLE TRACKING CONTROL ON SITE INCLUDING INSTALLATION DAILY MAINTENANCE AND REMOVAL AND DISPOSAL IN CONFORMANCE WITH ALL C.C.D. STANDARD NOTES AND DETAILS MADE PART OF THESE CONSTRUCTION REQUIREMENTS BY REFERENCE.



UNDERGROUND UTILITY VAULT CONFIGURATION



Denver Parks + Recreation
 PROJECT:
Cramer Park Sun Dial Terrace Reconstruction
 SHEET TITLE:
Existing Conditions & Removals Plan South

PROJECT NO.:	2016-PROJMSTR-0000573
SCALE:	N.A.
DESIGNED BY:	ADS
DRAWN BY:	ADS
CHECKED BY:	MEH
DATE:	01-15-17
REVISIONS:	02-15-17 02-20-17
PREPARED BY:	Applied Design Services 9721 Bayou Ridge Trail Parker, Colorado 80134 (303) 841-7077 Fax - 841-8191
SHEET NO.:	SDT-3



Know what's below
Call before you dig.

DETAILED REMOVAL SPECIFICATION:

SUB GRADE REMOVAL AND DISPOSAL:
SUB GRADE REMOVAL IS TO BE COMPLETE AND IN PLACE INCLUDING THE REMOVAL AND DISPOSAL OF ALL MATERIAL ENCOUNTERED REGARDLESS OF COMPOSITION. ALL SUB GRADE MATERIAL IS CONSIDERED AS UNCLASSIFIED EXCAVATION. SUB GRADE REMOVAL TO THE LINES AND GRADES INDICATED IS TO BE COMPLETE AND IN PLACE, INCLUDING BUT NOT LIMITED TO:

REMOVAL AND DISPOSAL OFF SITE OF MORTAR BED, REINFORCED CONCRETE SLAB, NON REINFORCED TRENCH FORMED CONCRETE SLAB SUPPORTS AND SOIL WITHIN THE ENTIRE UPPER TERRACE AND LOWER PLAZA FOOTPRINT INCLUDING ALL STEP SECTIONS TO AN ELEVATION OF 5433.00.

Test Pit No.1:

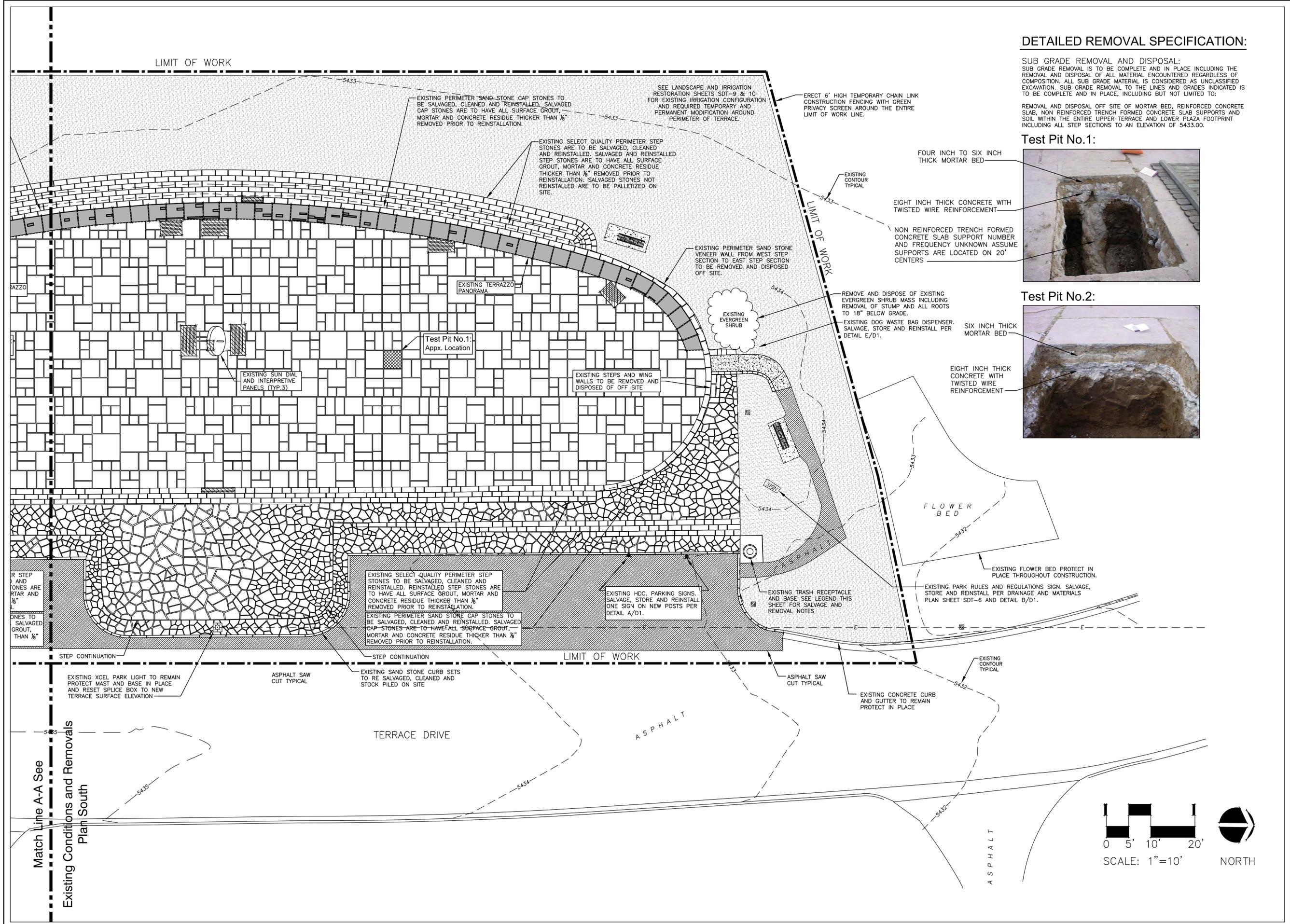


FOUR INCH TO SIX INCH THICK MORTAR BED
EIGHT INCH THICK CONCRETE WITH TWISTED WIRE REINFORCEMENT
NON REINFORCED TRENCH FORMED CONCRETE SLAB SUPPORT NUMBER AND FREQUENCY UNKNOWN ASSUME SUPPORTS ARE LOCATED ON 20' CENTERS

Test Pit No.2:

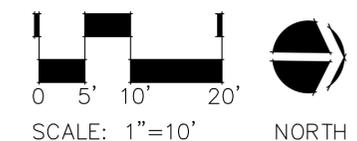


SIX INCH THICK MORTAR BED
EIGHT INCH THICK CONCRETE WITH TWISTED WIRE REINFORCEMENT



Denver Parks + Recreation
PROJECT: **Cranmer Park Sun Dial Terrace Reconstruction**
SHEET TITLE: **Existing Conditions & Removals Plan North**

PROJECT NO.:	2016-PROJMSTR-0000573
SCALE:	N.A.
DESIGNED BY:	ADS
DRAWN BY:	ADS
CHECKED BY:	MEH
DATE:	01-15-17
REVISIONS:	02-15-17 02-20-17
PREPARED BY:	Applied Design Services 9721 Bayou Ridge Trail Parker, Colorado 80134 (303) 841-7077 Fax - 841-8191
SHEET NO.:	SDT-4





Know what's below
Call before you dig.

EXISTING UTILITY LEGEND:

---24"W---	EXISTING UNDER GROUND WATER MAIN. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.
---3"G---	EXISTING UNDER GROUND GAS MAIN. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.
---8" SAN---	EXISTING UNDER GROUND SANITARY SEWER MAIN. CONFIRM DEPTH AT MANHOLE TO BE LOWERED. SEE GENERAL REMOVAL NOTES THIS SHEET FOR ADDITIONAL INFORMATION.
==15" STM==	EXISTING UNDER GROUND STORM SEWER MAIN. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.
◆OHE---	EXISTING OVERHEAD ELECTRIC SERVICE TO RECONFIGURED BY UTILITY PROVIDER. CONTRACTOR TO COORDINATE XCELL WORK WITHIN THE SEQUENCE OF CONSTRUCTION.

THE UTILITIES SHOWN WERE PLOTTED FROM MAPS PROVIDED BY THE SERVICING ENTITY (UTILITY PROVIDER) AND VERIFIED ABOVE GROUND WHERE VISIBLE. COMMUNICATION CABLES SUCH AS TELEPHONE AND CABLE TV MAY EXIST ON OR NEAR THIS PROPERTY. MAPS WERE NOT AVAILABLE FROM THE SERVICING ENTITY FOR THESE UTILITIES.

CALL THE UTILITY NOTIFICATION CENTER OF COLORADO @ 1-800-922-1987, TWO (2) BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

SURVEY SYMBOL LEGEND:

⊗	FIRE HYDRANT
⊙	WATER VALVE
⊕	WATER MANHOLE
⊠	IRRIGATION CONTROL BOX
▽	SIGN
●	POST / BOLLARD
⊙	POWER POLE
⊛	LIGHT POLE
⊠	TRAFFIC SIGNAL
⊠	ELECTRIC BOX
⊙	SANITARY MANHOLE
⊠	STORM INLET
⊙	STORM MANHOLE
⊙	CHAIN LINK FENCE

MATERIALS SYMBOL LEGEND:

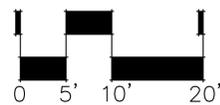
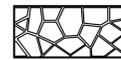
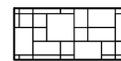
NEW 6" THICK CONCRETE PAVEMENT SEE SPECIFICATION SECTION 32 13 13 CONCRETE WALKS, CURBS AND MISCELLANEOUS FLATWORK AND SPECIFICATION SECTION 03 30 00 CAST-IN-PLACE CONCRETE FOR MIX DESIGN AND FINISH SPECIFICATION. CONCRETE WALKS AND ALL OTHER MISCELLANEOUS SLAB ON GRADE CONCRETE TO HAVE 1 1/2" DEEP SAWED CONTROL JOINTS CONFIGURED AS SHOWN ON PLAN. WITH 6" CDOT CLASS 6 AGGREGATE BASE COURSE.

NEW 2 1/2" THICK SAWED FACE AND SPLIT BED LYONS RED UPPER TERRACE SANDSTONE PAVING FIELD STONES. SIZES ARE 24" SQUARE, 24" BY 48" RECTANGULAR AND 48" SQUARE. THICKNESS IS TO BE 2 1/2" WITH A MAXIMUM THICKNESS VARIATION OF +0R- 1/8". SUBMIT FIVE 12" SQUARE SAMPLE STONES WHICH REPRESENT THE MAXIMUM VARIATION IN COLOR AND GRAIN TO OWNER FOR REVIEW AND APPROVAL PRIOR TO ORDERING. MOCK UP 100 SQ. FT. OF RANDOM ASHLAR PAVER PATTERN FOR REVIEW AND APPROVAL OF OWNER PRIOR TO COMMENCING UPPER TERRACE FIELD STONE INSTALLATION. PAVERS ARE TO BE SET ON A SAND BED WITH POLYMER AMENDED SAND FILLED JOINTS. MAXIMUM JOINT WIDTH IS 1/4". FIELD CUT PERIMETER UPPER TERRACE FIELD STONE PAVERS TO FIT RADIUS OF SALVAGED AND REINSTALLED CAP STONES AND TERRAZZO PANORAMA.

NEW 2 1/2" THICK SNAPPED FACE AND SPLIT BED LYONS RED LOWER PLAZA SANDSTONE PAVING FIELD STONES. SIZES RANGE FROM A MINIMUM OF ONE SQUARE FOOT TO A MAXIMUM OF FIVE SQUARE FEET. THICKNESS IS TO BE 2 1/2" WITH A MAXIMUM THICKNESS VARIATION OF +0R- 1/8". SUBMIT FIVE SAMPLE STONES WHICH REPRESENT THE MAXIMUM VARIATION IN COLOR, GRAIN AND SIZE TO OWNER FOR REVIEW AND APPROVAL PRIOR TO ORDERING. MOCK UP 100 SQ. FT. OF PAVER PATTERN FOR REVIEW AND APPROVAL OF OWNER PRIOR TO COMMENCING LOWER PLAZA FIELD STONE INSTALLATION. PAVERS ARE TO BE SET ON A SAND BED WITH POLYMER AMENDED SAND FILLED JOINTS. MAXIMUM JOINT WIDTH IS 1/2".

NEW 5" THICK ASPHALT PAVEMENT INSTALLED OVER 6" OF C.D.O.T. CLASS 6 AGGREGATE BASE COURSE COMPACTED TO 95% M.P.D. PER ASTM D-1557. SEE SPECIFICATION SECTION 32 12 16 FOR COMPLETE REQUIREMENTS.

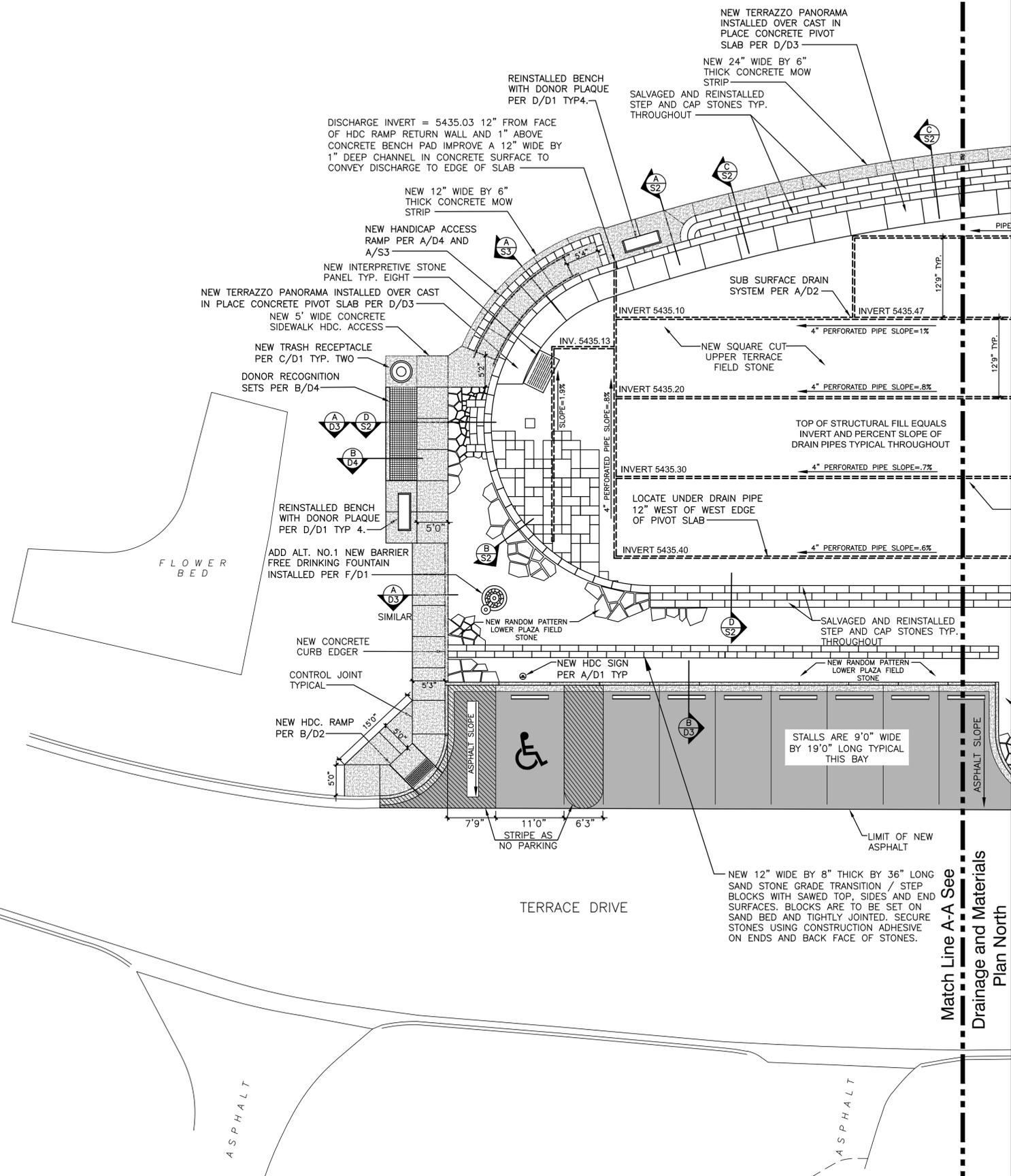
TRAFFIC MARKING PAINT: COLORS WHITE AND BLUE SEE SPECIFICATION SECTION 32 12 16 FOR COMPLETE REQUIREMENTS.



SCALE: 1"=10'



NORTH



Denver Parks + Recreation

PROJECT: Cranmer Park Sun Dial Terrace Reconstruction

SHEET TITLE: Drainage and Materials Plan South

PROJECT NO.: 2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

CHECKED BY: MEH

DATE: 01-15-17

REVISIONS: 02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO.: SDT-5

Match Line A-A See
Drainage and Materials
Plan North



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE:
Drainage and Materials Plan
North

PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

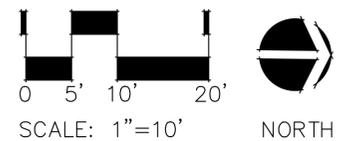
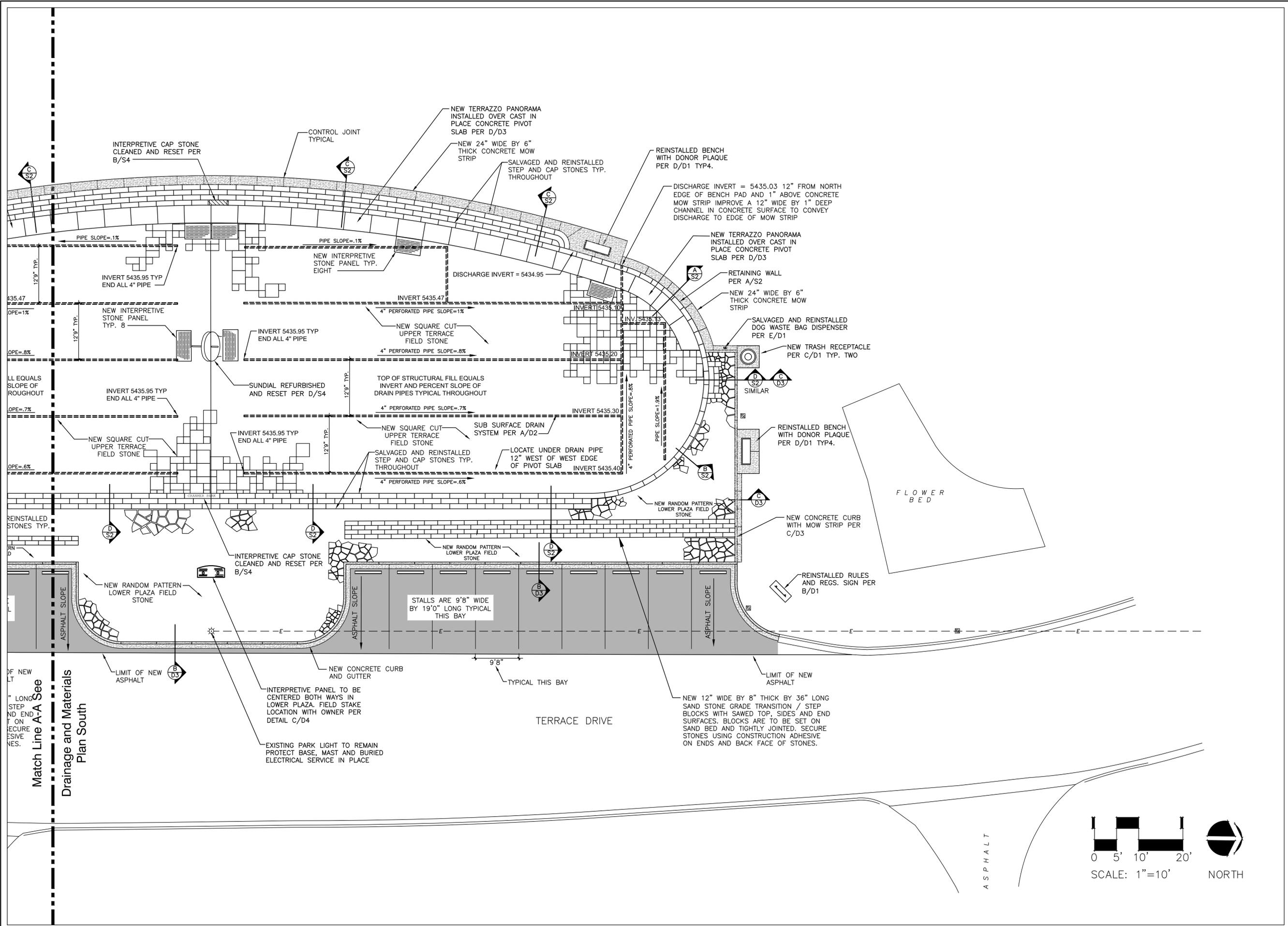
CHECKED BY: MEH

DATE: 01-15-17

REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO: SDT-6



ASPHALT



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE:
Layout and Grading Plan
North

PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

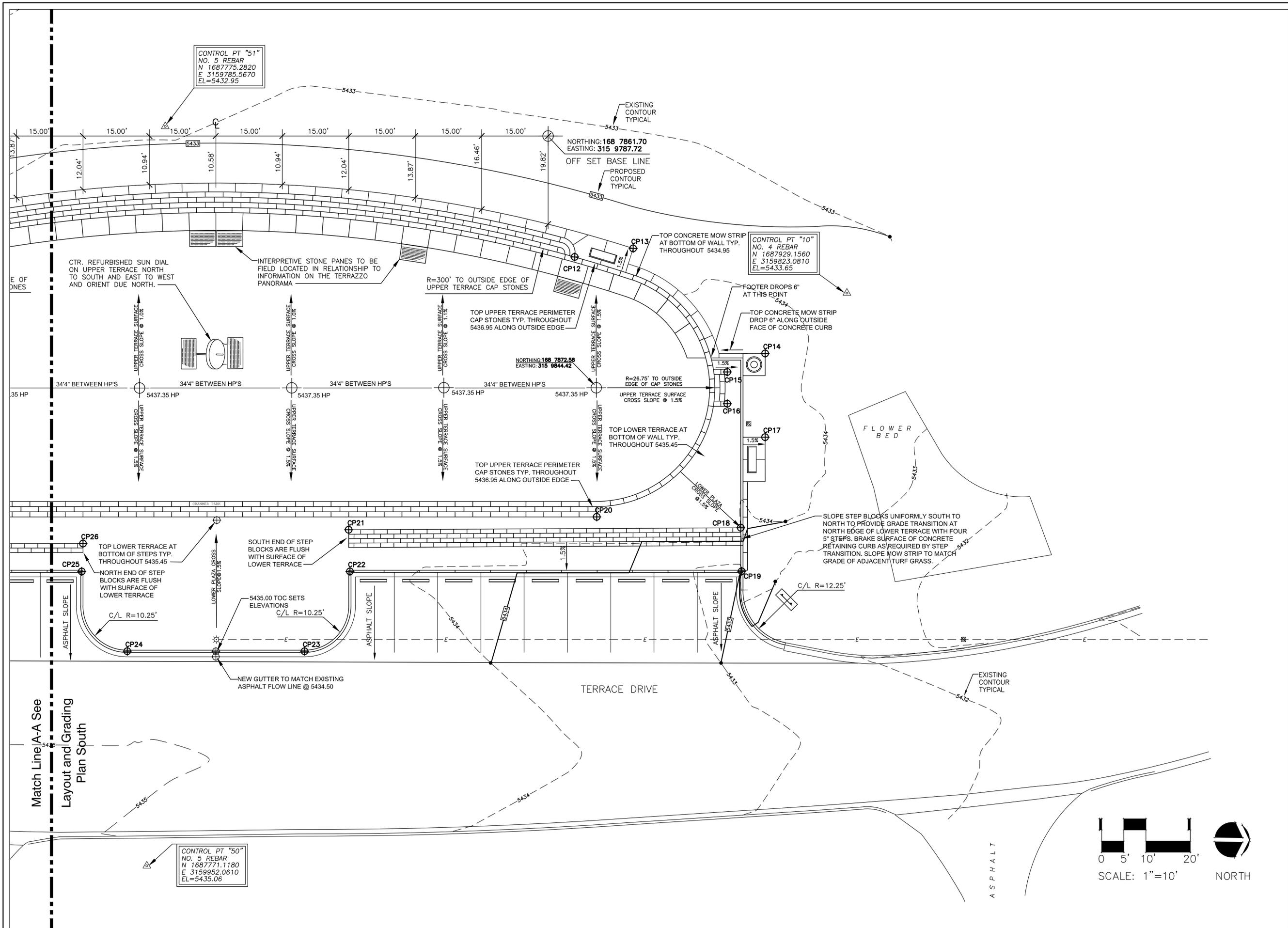
CHECKED BY: MEH

DATE: 01-15-17

REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO: SDT-8



Match Line A-A See
Layout and Grading
Plan South



Know what's below
Call before you dig.

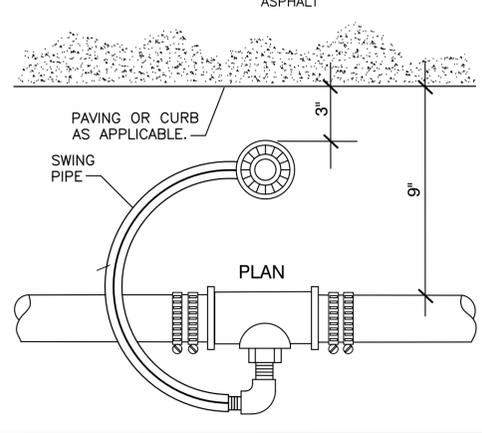
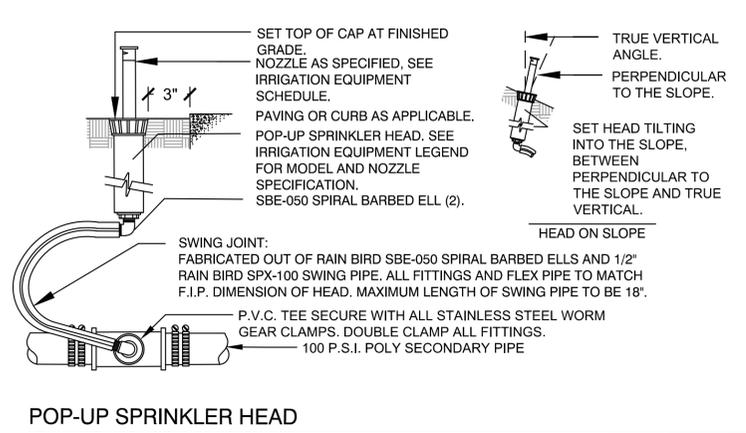
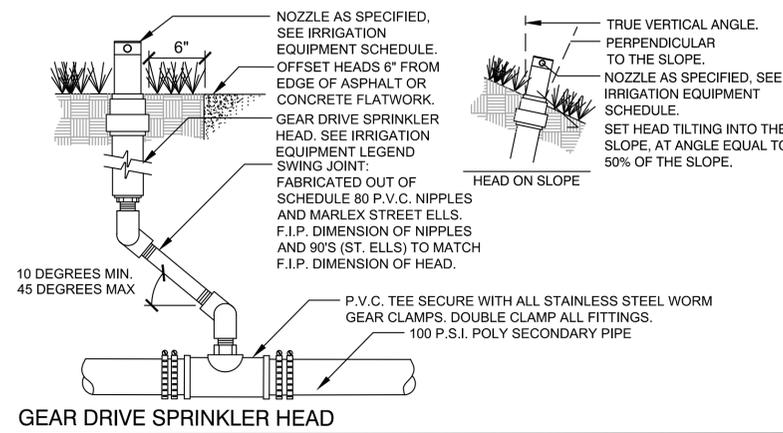
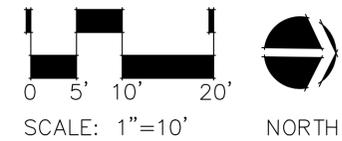
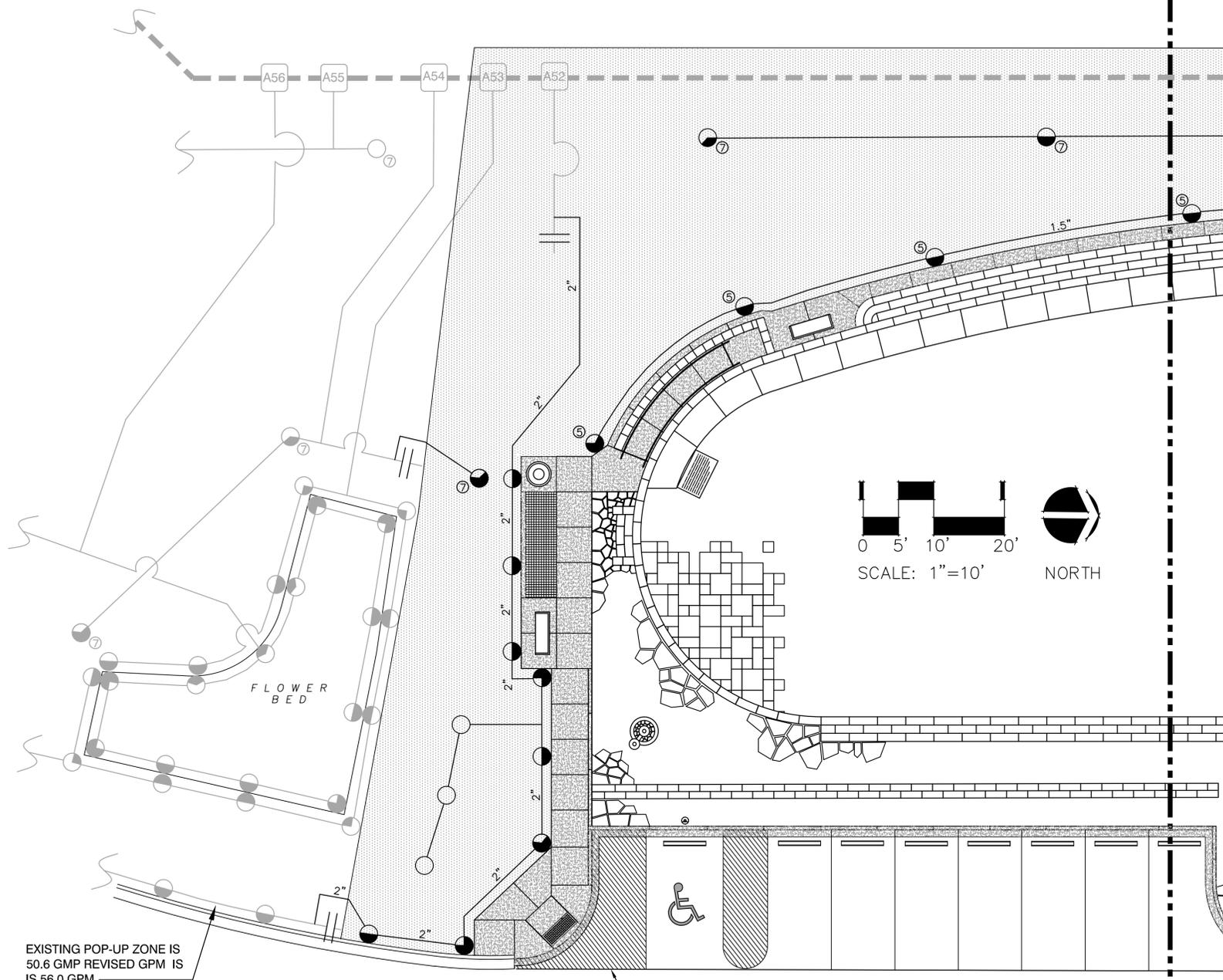
ZONE A
IS 60.0
IS 60.0

EXISTING IRRIGATION EQUIPMENT LEGEND:

Symbol:	Description:
	EXISTING ELECTRIC CONTROL VALVE (WITH CONTROLLER STATION NUMBER) PROTECT IN PLACE. SET TEE POSTS AND ORANGE PLASTIC CONSTRUCTION FENCE AROUND ALL IRRIGATION VALVE BOXES WITHIN THE LIMIT OF WORK. MAINTAIN FENCE THROUGHOUT CONSTRUCTION AND REMOVE AT PROJECT COMPLETION.
	EXISTING QUICK COUPLER VALVE PROTECT IN PLACE. SET TEE POSTS AND ORANGE PLASTIC CONSTRUCTION FENCE AROUND ALL IRRIGATION VALVE BOXES WITHIN THE LIMIT OF WORK. MAINTAIN FENCE THROUGHOUT CONSTRUCTION AND REMOVE AT PROJECT COMPLETION.
	EXISTING ISOLATION VALVE PROTECT IN PLACE. SET TEE POSTS AND ORANGE PLASTIC CONSTRUCTION FENCE AROUND ALL IRRIGATION VALVE BOXES WITHIN THE LIMIT OF WORK. MAINTAIN FENCE THROUGHOUT CONSTRUCTION AND REMOVE AT PROJECT COMPLETION.
	EXISTING AIR RELIEF VALVE PROTECT IN PLACE. SET TEE POSTS AND ORANGE PLASTIC CONSTRUCTION FENCE AROUND ALL IRRIGATION VALVE BOXES WITHIN THE LIMIT OF WORK. MAINTAIN FENCE THROUGHOUT CONSTRUCTION AND REMOVE AT PROJECT COMPLETION.
	EXISTING 8" CL-200 P.V.C. IRRIGATION MAINLINE WITH VALVE CONTROL WIRE INSTALLED 30" DEEP. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.
	EXISTING POLYETHYLENE SECONDARY IRRIGATION LINE INSTALLED 12" DEEP FOR POP-UP SPRAYS AND 18" DEEP FOR GEAR DRIVE HEADS. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.
	EXISTING POP-UP SPRINKLER HEAD TO REMAIN. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.
	EXISTING GEAR DRIVE SPRINKLER HEAD TO REMAIN. PROTECT IN PLACE THROUGHOUT CONSTRUCTION.

NEW IRRIGATION EQUIPMENT LEGEND:

Symbol:	Description:
1.5" 2"	NEW 100 P.S.I., S.I.D.R.-15, HIGH DENSITY PE-3408 POLYETHYLENE SECONDARY PIPE BY P.W. PIPE OR APPROVED EQUAL. SECONDARY PIPE IS SIZED ON DRAWINGS ALL UNSIZED PIPE IS 1". ALL INSERT FITTINGS TO BE MADE UP WITH ALL STAINLESS STEEL WORM GEAR CLAMPS. DOUBLE CLAMP ALL CONNECTIONS THROUGHOUT. INSTALLED 12" DEEP FOR POP-UP SPRAYS AND 18" DEEP FOR GEAR DRIVE HEADS. HYDRAULICALLY COMPACT ALL TRENCHES TO MATCH DENSITY OF ADJACENT UNDISTURBED SOIL.
	NEW RAIN BIRD 1806 SAM-PRS-D POP-UP SPRINKLER HEAD WITH 12'x15" MPR SERIES PLASTIC NOZZLES. SEE INSTALLATION DETAIL THIS SHEET FOR SWING JOINT CONFIGURATION.
	NEW HUNTER 1-20 ULTRA 06-SS GEAR DRIVE ROTARY SPRINKLER HEAD WITH STAINLESS STEEL RISER AND NO.4 NOZZLES. SEE INSTALLATION DETAIL THIS SHEET FOR SWING JOINT CONFIGURATION.
	NEW HUNTER 1-40-06-SS GEAR DRIVE ROTARY SPRINKLER HEAD WITH STAINLESS STEEL RISER AND NO.10 NOZZLES. SEE INSTALLATION DETAIL THIS SHEET FOR SWING JOINT CONFIGURATION.
	LOCATE, EXCAVATE CUT, TEMPORARY CAP, TIE IN AND EXTEND NEW OR REFEED EXISTING PIPING SYMBOL.



Denver Parks + Recreation

SHEET TITLE:
Landscape and Irrigation
Plan South

PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

CHECKED BY: MEH

DATE: 01-15-17

REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO: SDT-9



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE:
Add Alternate No.1 Drinking
Fountain P.O.C. and Service
Line Plan

PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

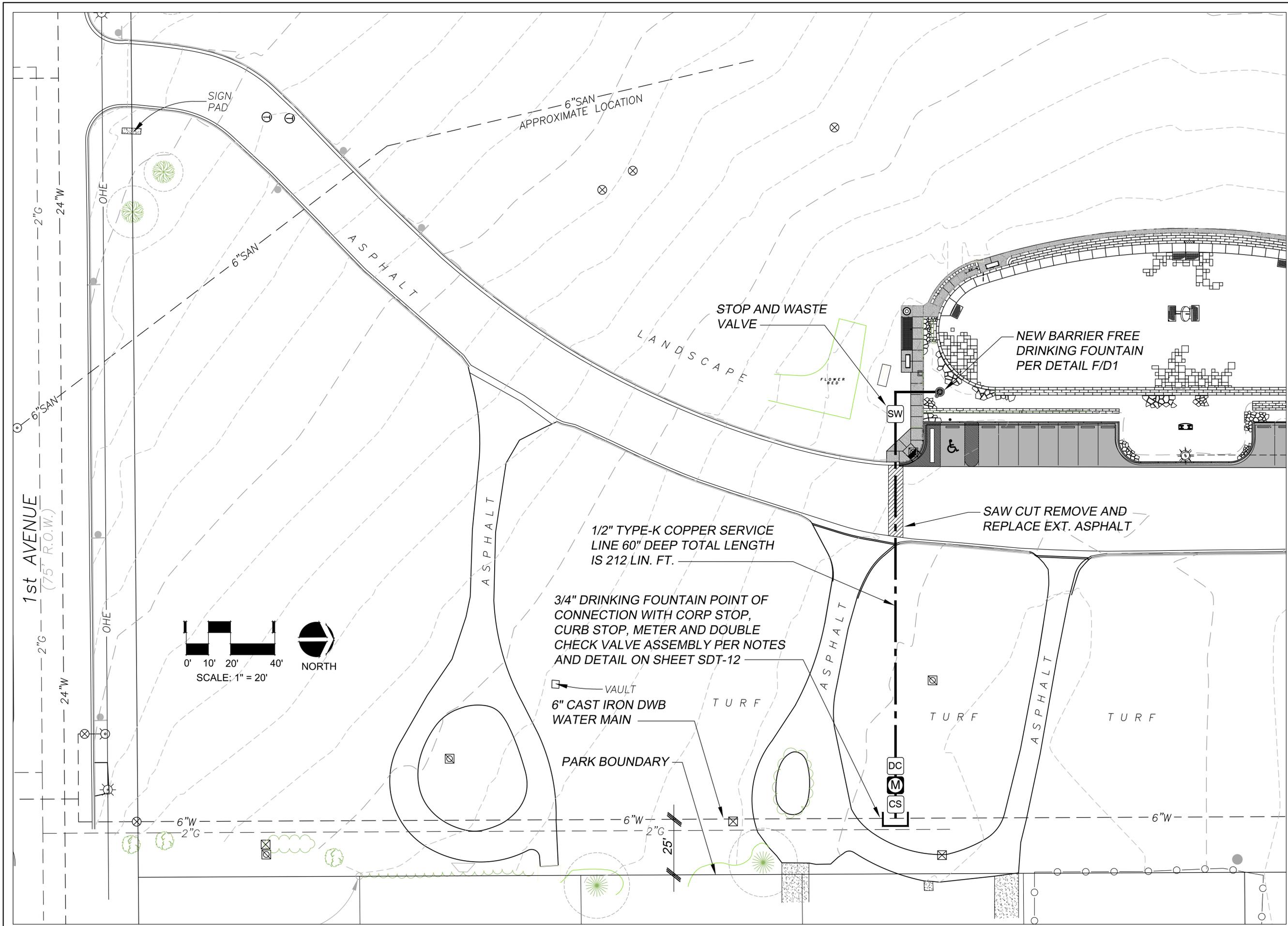
CHECKED BY: MEH

DATE: 02-15-17

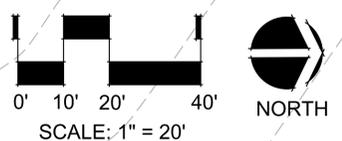
REVISIONS:
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO: SDT-11



1st AVENUE
(75' R.O.W.)



1/2" TYPE-K COPPER SERVICE
LINE 60" DEEP TOTAL LENGTH
IS 212 LIN. FT.

3/4" DRINKING FOUNTAIN POINT OF
CONNECTION WITH CORP STOP,
CURB STOP, METER AND DOUBLE
CHECK VALVE ASSEMBLY PER NOTES
AND DETAIL ON SHEET SDT-12

VAULT
6" CAST IRON DWB
WATER MAIN

PARK BOUNDARY

STOP AND WASTE
VALVE

NEW BARRIER FREE
DRINKING FOUNTAIN
PER DETAIL F/D1

SAW CUT REMOVE AND
REPLACE EXT. ASPHALT

LANDSCAPE

ASP HALT

ASP HALT

ASP HALT

ASP HALT

TURF

TURF

TURF

SIGN
PAD

OHE

6" SAN
APPROXIMATE LOCATION

6" SAN

ASP HALT

2" C

24" W

2" C

24" W

6" W

2" C

6" W

2" C

6" W

25'



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE:
Add Alternate No.1 Drinking Fountain P.O.C. Detail and Notes

PROJECT:
Cranmer Park Sun Dial Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

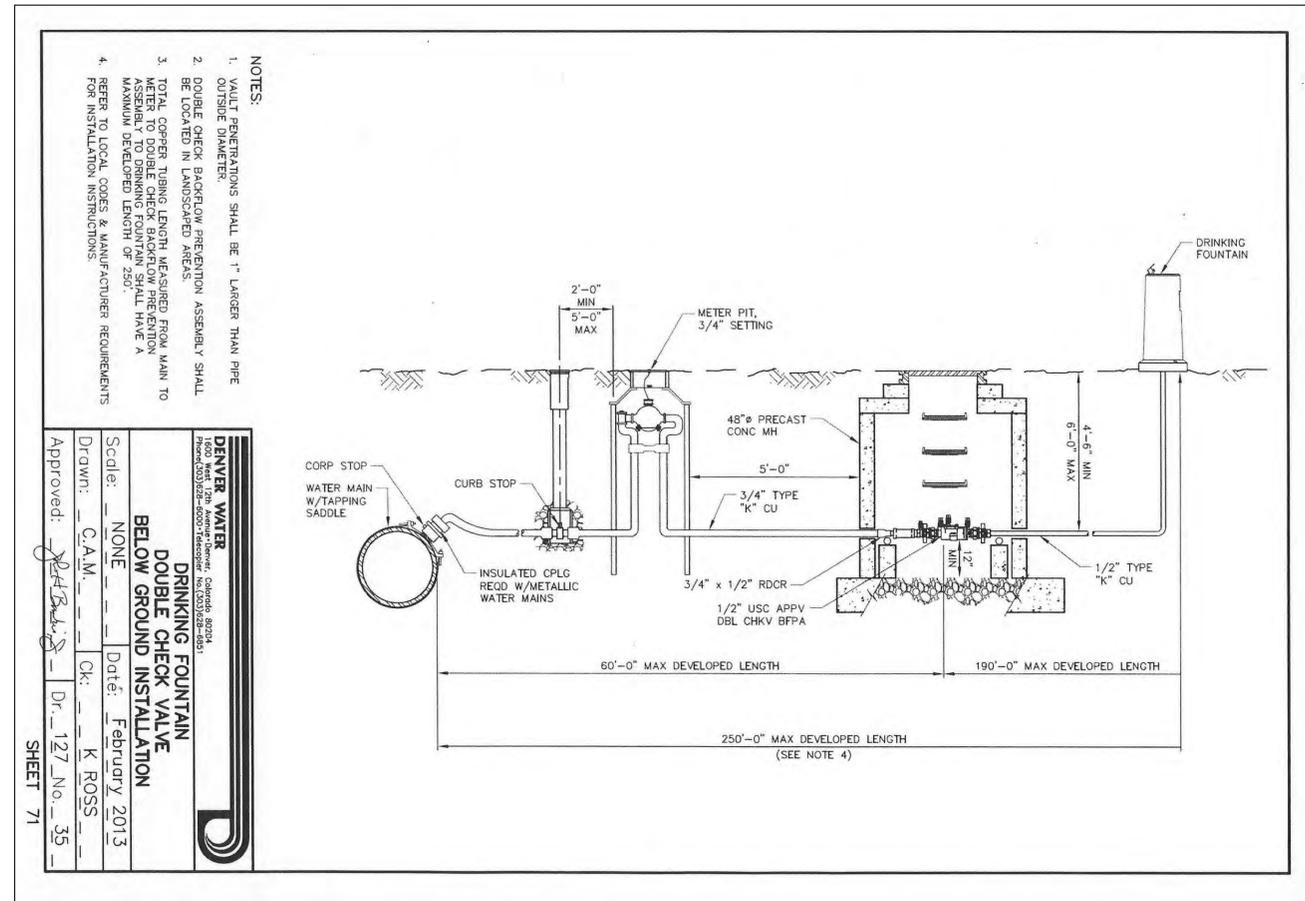
CHECKED BY: MEH

DATE: 02-15-17

REVISIONS:
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

SHEET NO: SDT-12



NEW WATER SUPPLY POINT OF CONNECTION INSTALLATION NOTES:

New water supply point of connection is to be installed complete and in place, self contained an fully operational including but not limited to:

- 1) ALL WORK IS TO BE PERFORMED IN STRICT CONFORMANCE WITH ALL DENVER WATER BOARD STANDARDS AND SPECIFICATIONS LATEST EDITION MADE PART OF THESE CONSTRUCTION REQUIREMENTS BY REFERENCE.
- 2) ALL UTILITY PROVIDER COORDINATION INCLUDING ALL METER PURCHASE, METER CALIBRATION AND WET TAP LABOR COSTS AND ASSOCIATED FEES. COORDINATE NEW TAP INSTALLATION WITH DENVER WATER, WATER SALES DEPARTMENT AND METER INSPECTIONS DIVISION.
- 3) PULL AND PAY FOR ALL REQUIRED PERMITS AND CALL FOR AND PAY FOR ALL REQUIRED INSPECTIONS.
- 4) POT HOLE UTILITIES, SAW CUT, REMOVAL AND REPLACEMENT OF EXISTING ASPHALT PAVEMENT, SAW CUT (CONTROL JOINT TO CONTROL JOINT) REMOVAL AND REPLACEMENT OF EXISTING CONCRETE CURB AND GUTTER.
- 5) REMOVAL AND REPLACEMENT OF EXISTING TURF GRASS TO MATCH EXISTING. PROVIDE A MECHANICAL CUT EDGE WHERE REPLACEMENT SOD IS TO MATCH EXISTING TURF GRASS TO REMAIN.
- 6) EXCAVATION, BACKFILL AND COMPACTION OF SOIL AS REQUIRED TO EXPOSE THE 6" CAST IRON WATER MAIN LOCATED 25' FROM THE EAST PROPERTY LINE OF THE PARK. AS WELL AS, ALL EXCAVATION BACKFILL AND COMPACTION REQUIRED FOR INSTALLATION OF THE SERVICE LINE TO THE DRINKING FOUNTAIN.
- 7) SUPPLY AND INSTALLATION OF A 6" BY 3/4" TAPPING SADDLE, 3/4" CORPORATION STOP, 3/4" TYPE-K COPPER SERVICE LINE WITH ALL SILVER SOLDERED OR BRASS COMPRESSION FITTINGS, 3/4" CURB STOP, 3/4" WATER METER WITH SETTING YOKE, VAULT, BASE, LID, MANHOLE RING AND COVER AND REMOTE READ DEVICE. INSTALLATION OF BELOW GROUND DOUBLE CHECK DEVICE WITH VAULT, LID, MANHOLE RING AND COVER AND 1/2" COPPER SERVICE LINE AT 60" DEEP FROM DISCHARGE SIDE OF DOUBLE CHECK VALVE ASSEMBLY TO DRINKING FOUNTAIN LOCATION WITH ALL SILVER SOLDERED OR BRASS COMPRESSION FITTINGS.
- 8) ALL EXISTING IRRIGATION SYSTEM LOCATION, PROTECTION AND REPAIR INCLUDING HAND DIGGING TO EXPOSE AND CROSS THE EXISTING MAINLINE AND WIRE.
- 9) ALL WORK ON THE POTABLE SERVICE IS TO BE PERFORMED BY A PLUMBING CONTRACTOR LICENSED IN THE CITY AND COUNTY OF DENVER AND APPROVED BY DENVER BOARD OF WATER COMMISSIONERS.
- 10) SYSTEM DEVELOPMENT FEES FOR THE NEW 3/4" DRINKING FOUNTAIN TAP HAVE BEEN WAIVED.



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE: Detail Plan
PROJECT: Cranmer Park Sun Dial Terrace Reconstruction

PROJECT NO.: 2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

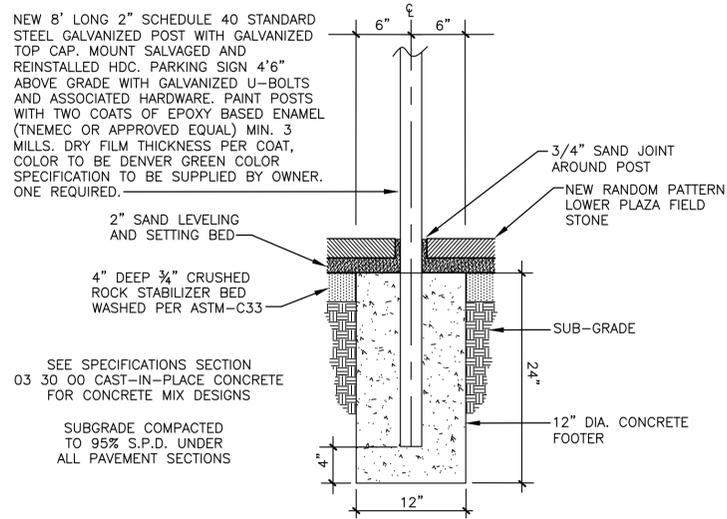
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DATE: 01-15-17

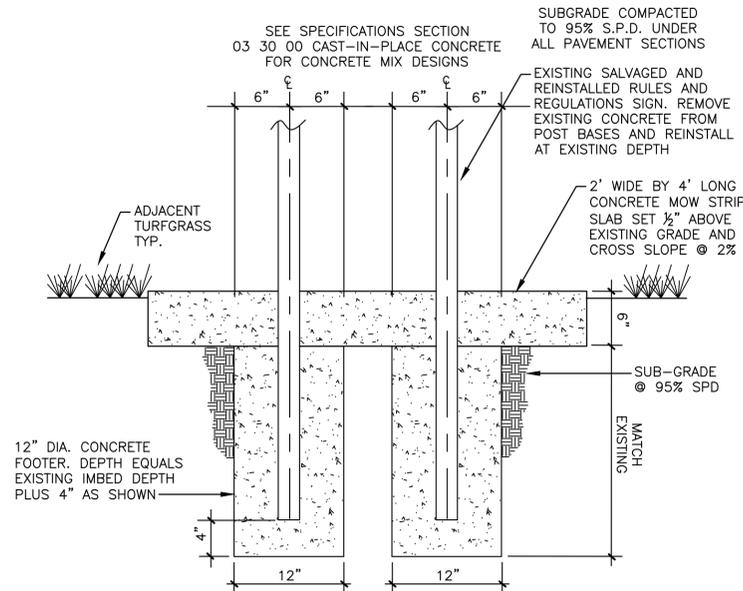
REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
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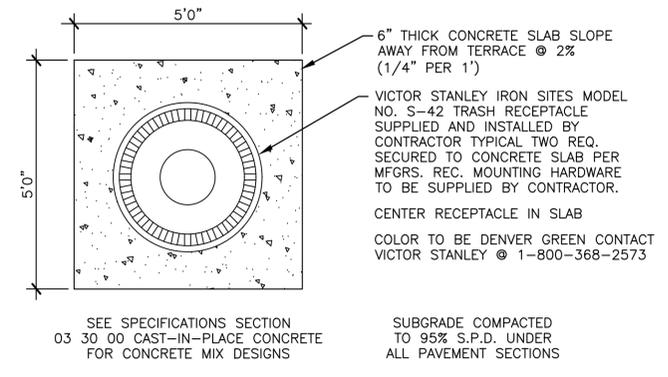
SHEET NO: D-1



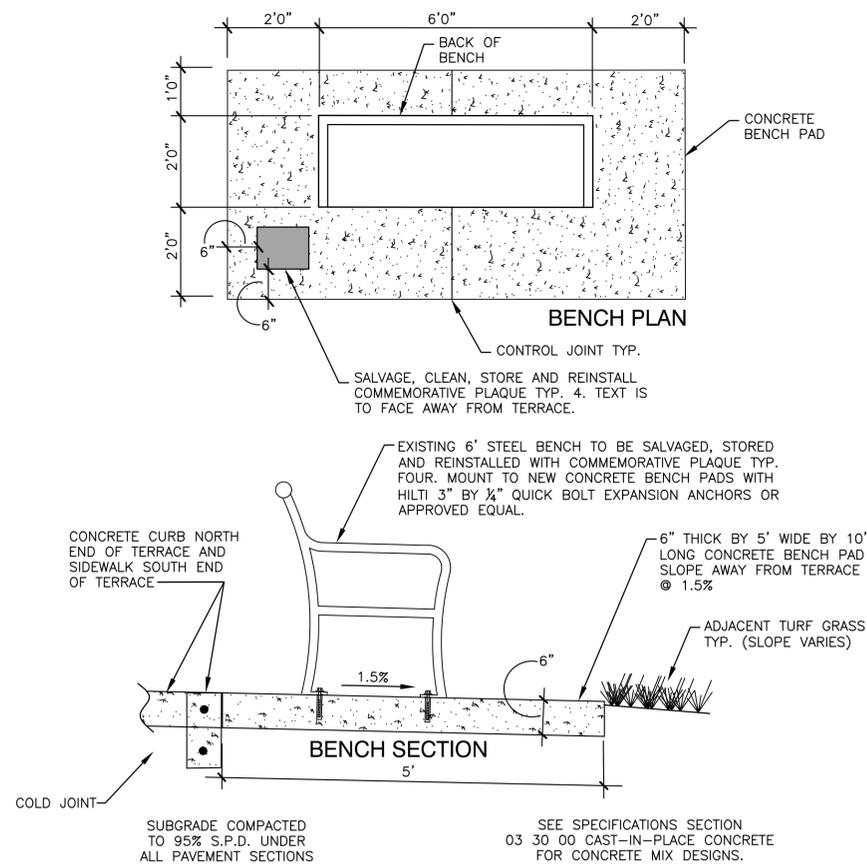
A HANDICAP SIGN SECTION
D1 No Scale



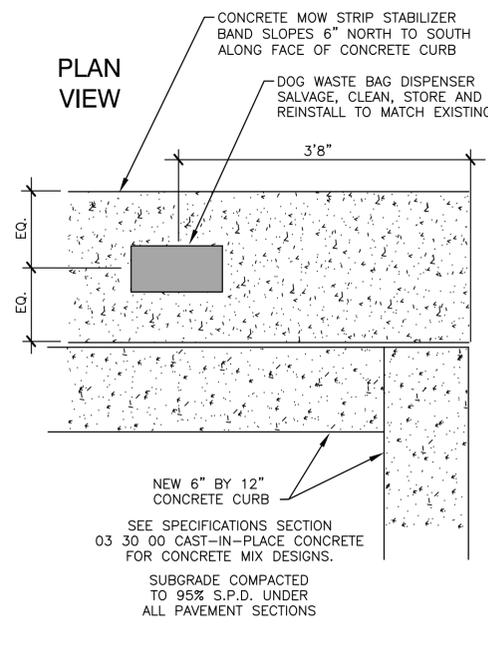
B RULES AND REGULATIONS SIGN
D1 No Scale



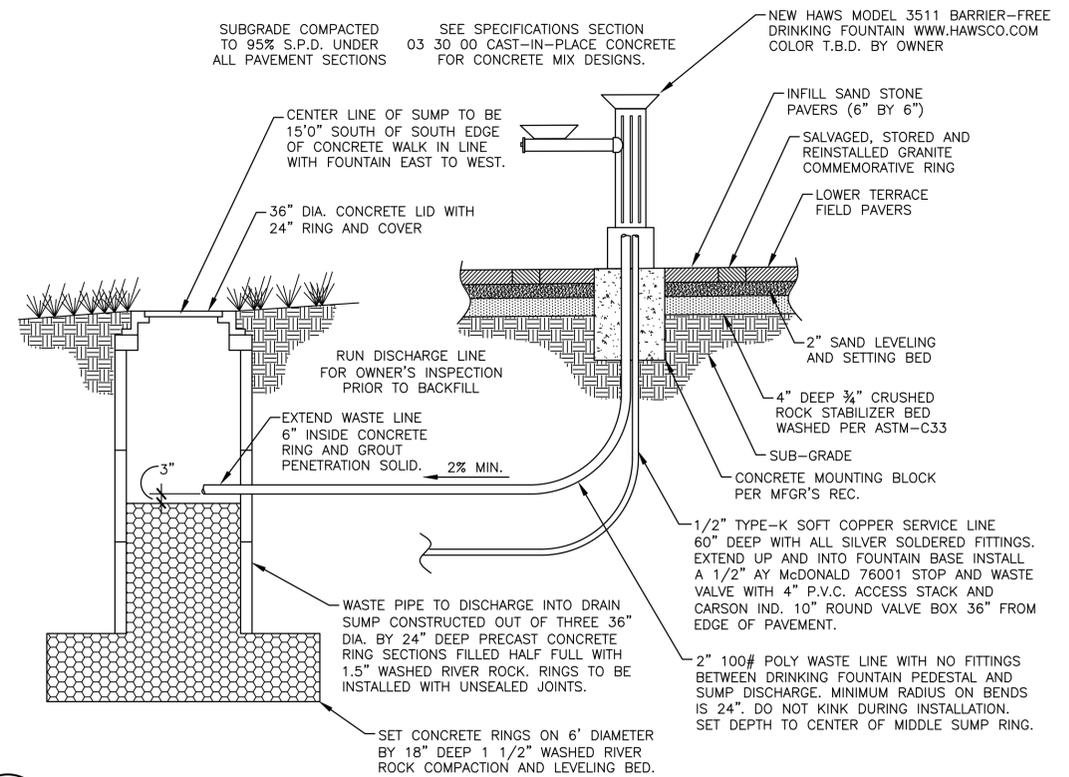
C TRASH RECEPTACLE PLAN VIEW
D1 No Scale



D BENCH WITH CONCRETE PAD
D1 No Scale



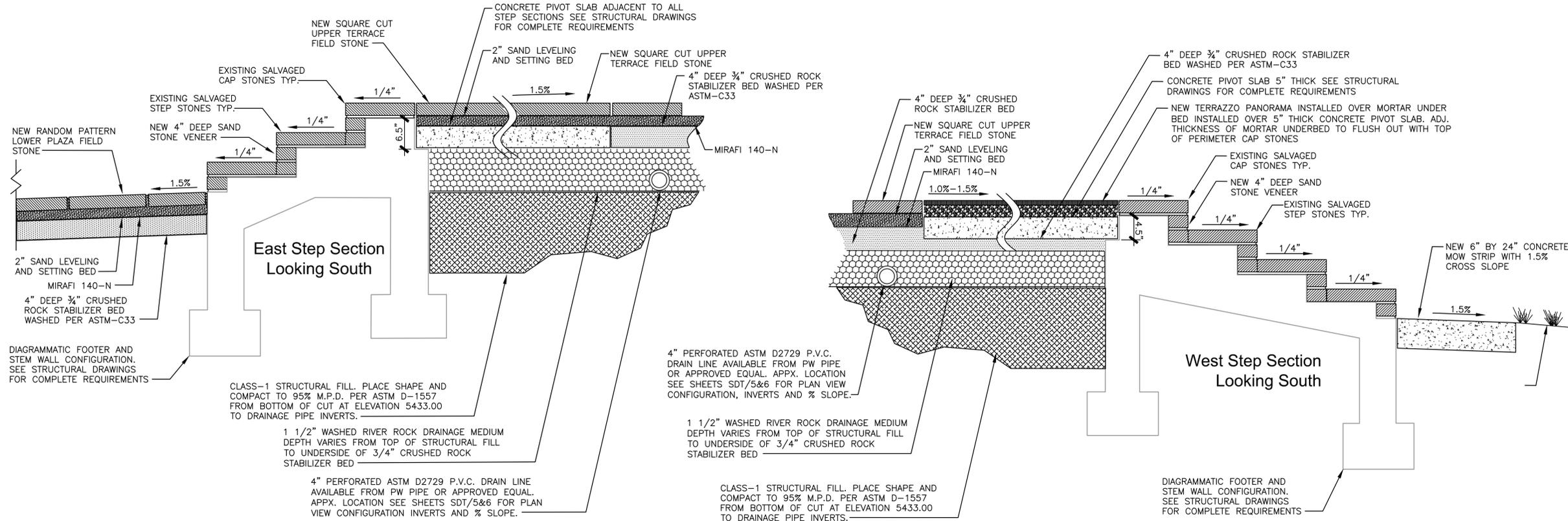
E DOG WASTE STATION
D1 No Scale



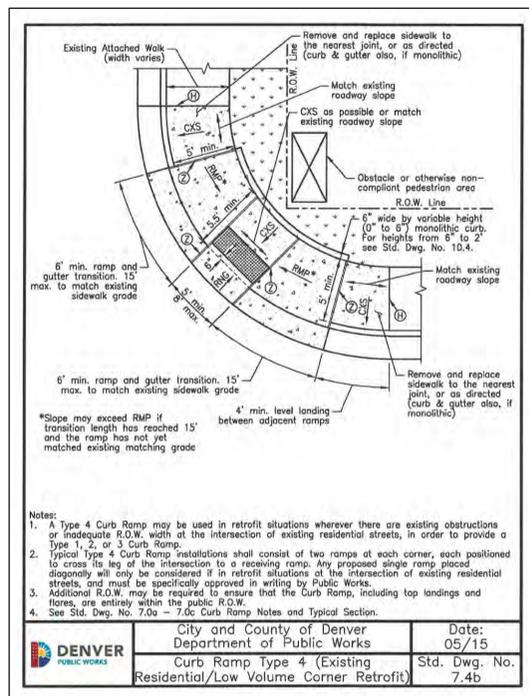
F ADD ALTERNATE No.1 DRINKING FOUNTAIN
D1 No Scale



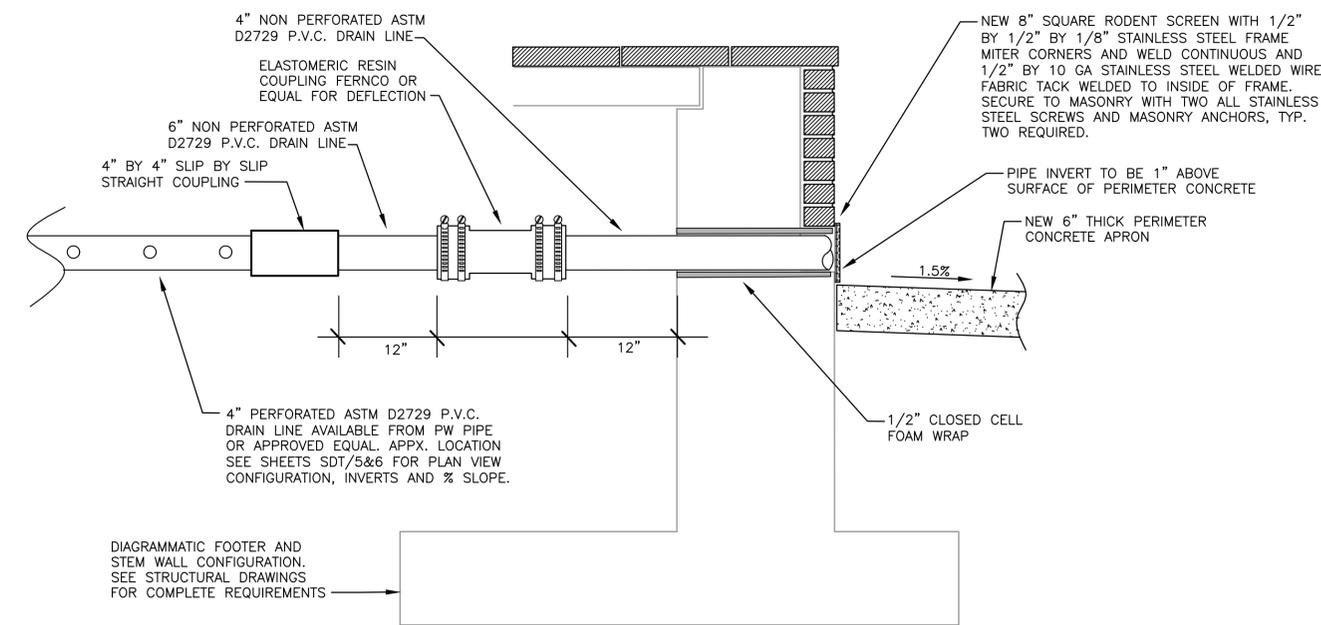
Know what's below
Call before you dig.



A SUB-GRADE AND UNDER DRAINAGE SYSTEM SECTION
D2 No Scale



B HANDICAP ACCESS RAMP
D2 No Scale



C UNDER DRAIN PIPE DAYLIGHT
D2 No Scale

Denver Parks + Recreation

SHEET TITLE:
Detail Plan

PROJECT:
Cranmer Park Sun Dial Terrace Reconstruction

PROJECT NO.:	2016-PROJMSTR-0000573
SCALE:	N.A.
DESIGNED BY:	ADS
DRAWN BY:	ADS
CHECKED BY:	MEH
DATE:	01-15-17
REVISIONS:	02-15-17 02-20-17
PREPARED BY:	Applied Design Services 9721 Bayou Ridge Trail Parker, Colorado 80134 (303) 841-7077 Fax - 841-8191
SHEET NO.:	D-2



Know what's below
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Denver Parks + Recreation

SHEET TITLE: Detail Plan
PROJECT: Cranmer Park Sun Dial Terrace Reconstruction

PROJECT NO.: 2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

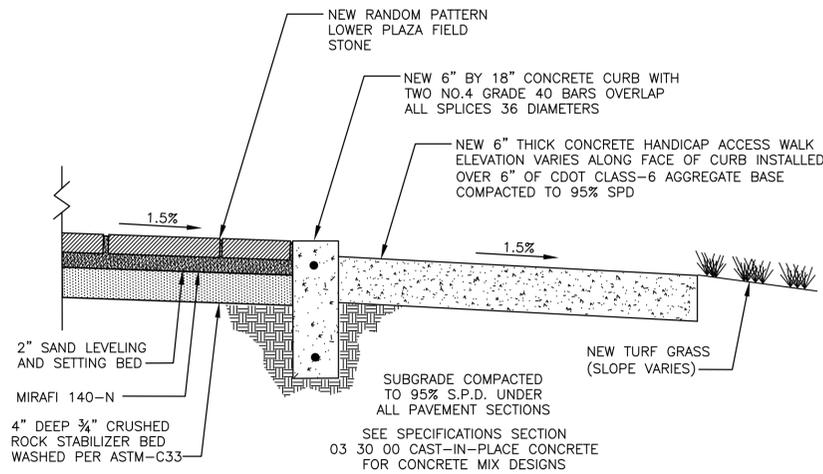
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DATE: 01-15-17

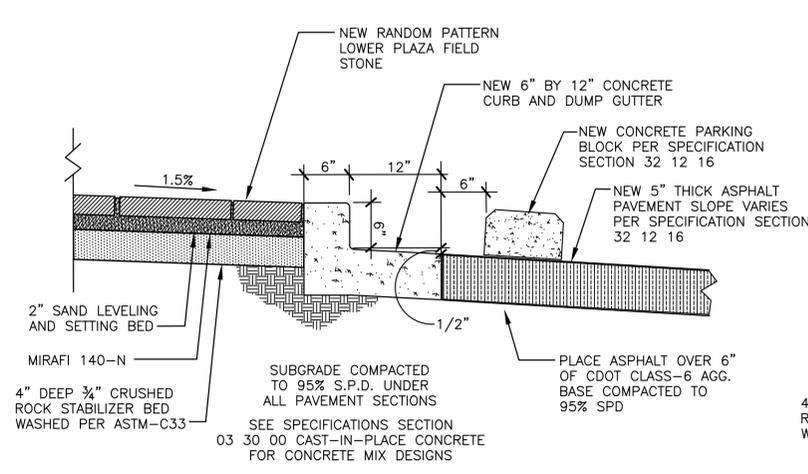
REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
(303) 841-7077
Fax - 841-8191

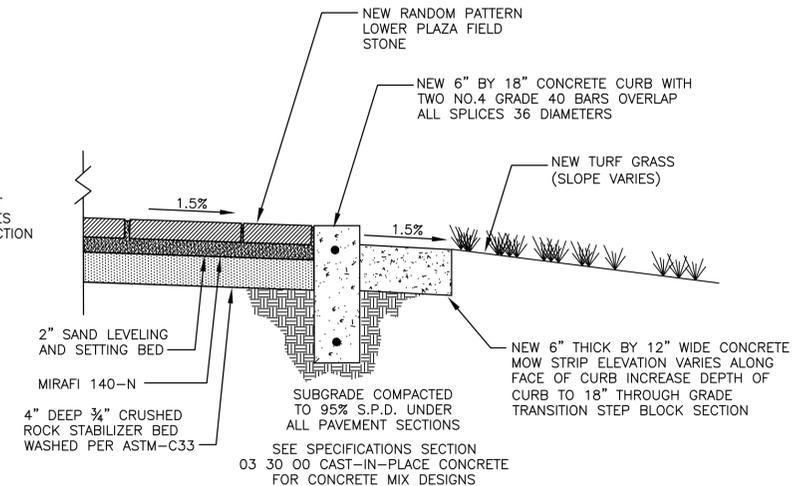
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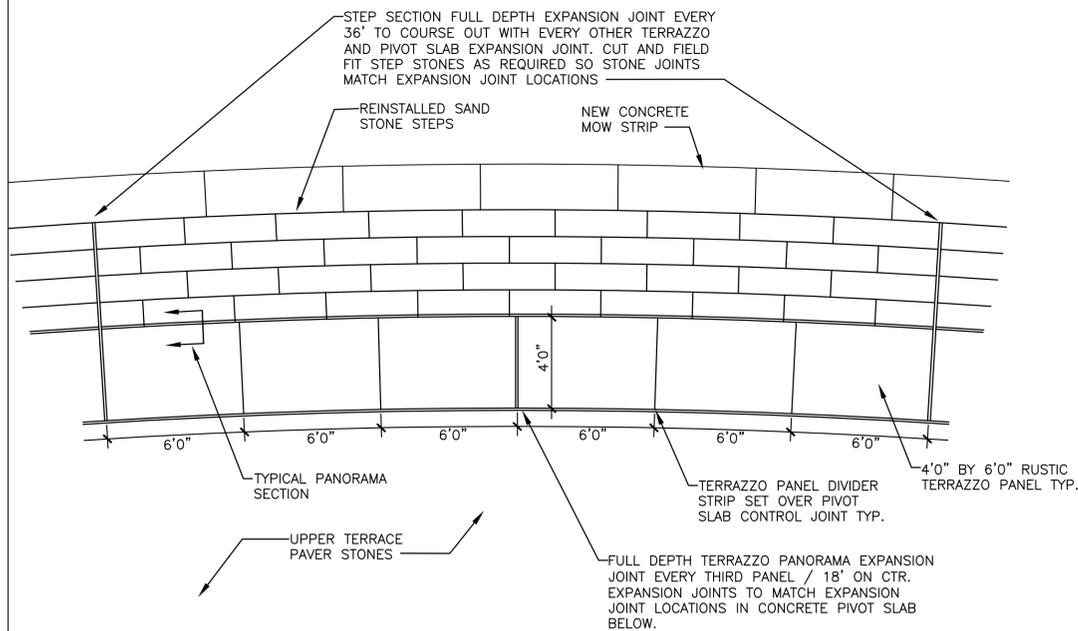
A LOWER PLAZA SECTION AT WALK
D3 No Scale



B LOWER PLAZA SECTION AT PARKING
D3 No Scale

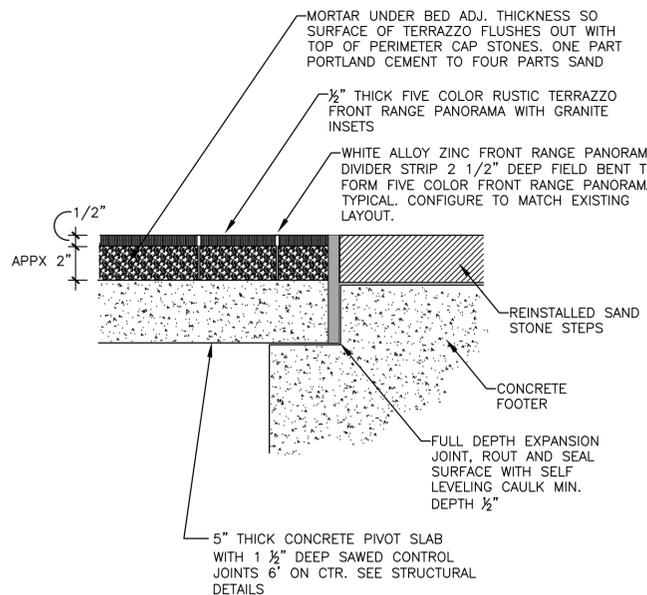


C LOWER PLAZA SECTION WITH TURF
D3 No Scale



Typical Panorama Plan

No Scale



Typical Panorama Section

No Scale

Terrazzo Panorama Specification:

- 1) DOCUMENTATION: PRIOR TO DEMOLITION, THE DESIGN OF EACH EXISTING 4' BY 4' TERRAZZO PANEL SHALL BE DOCUMENTED USING A FULL SIZE PERMANENT 3 MILL. DOUBLE MATTE MYLAR TRACING. EACH TRACING SHALL SHOW THE SEQUENTIAL PANEL NUMBER STARTING FROM SOUTH TO NORTH, CONFIGURATION OF ALL DIVIDER STRIPS, COLOR OR EACH TERRAZZO FIELD, AND LOCATION OF AND INFORMATION CONTAINED ON EACH GRANITE INSERT.
- 2) QUALITY ASSURANCE: TERRAZZO INSTALLER SHALL BE A MEMBER IN GOOD STANDING WITH THE NATIONAL TERRAZZO AND MOSAIC ASSOCIATION. SUPPLIERS SHALL PROVIDE MATERIALS IN ACCORDANCE WITH THE N.T.M.A. STANDARDS. INSTALLER SHALL SUBMIT A LIST OF AT LEAST THREE COMPLETED PROJECTS OF SIMILAR SCOPE AND COMPLEXITY WITH REFERENCE CONTACT INFORMATION.
- 3) SUBMITTALS / SAMPLES: SUBMIT THREE 12" SQUARE SAMPLES FOR EACH COLOR AND TYPE OF TERRAZZO SPECIFIED. SAMPLES TO MATCH EXISTING TERRAZZO AS CLOSELY AS POSSIBLE. SUBMIT THREE 12" LENGTHS OF EACH TYPE OF DIVIDER STRIP INCLUDING, PANEL DIVIDER STRIPS, TERRAZZO FIELD DIVIDER STRIPS AND EXPANSION JOINT DIVIDER STRIPS. SUBMIT THREE COPIES OF N.T.M.A. MAINTENANCE RECOMMENDATIONS.
- 4) MATERIALS: PORTLAND CEMENT - PER ASTM C 150, COLOR WHITE, SAND - CLEAN WASHED LOCALLY AVAILABLE, MARBLE CHIPS - TO CONFORM WITH N.T.M.A. GRADATION STANDARDS. HARDNESS ACCORDING TO ASTM C 241 Hg 10 MINIMUM; 24 HOUR ABSORPTION RATE NOT TO EXCEED 0.75%, WITH NO DELETERIOUS OF FOREIGN MATTER AND A DUST CONTENT LESS THAN 1% BY WEIGHT. DIVIDER STRIPS - ALL WHITE ALLOY ZINC HEAVY TOP STRIP (MATERIAL) WITH A DEPTH OF 2 1/2" AND A THICKNESS OF 1/8". DIVIDER STRIPS TO REPLICATE EXISTING CONFIGURATION AS CLOSELY AS POSSIBLE. COLORANT - ALKALI RESISTANT COLOR STABLE PIGMENTS TO MATCH EXISTING COLOR FIELDS.
- 5) MIXES: UNDER BED - ONE PART PORTLAND CEMENT AND FOUR PARTS SAND WITH SUFFICIENT WATER TO PROVIDE WORKABILITY WITH AS LOW A SLUMP AS POSSIBLE. TERRAZZO TOPPING - ONE 94 POUND BAG OF PORTLAND CEMENT PER 200-220 POUNDS OF MARBLE CHIPS, COLOR PIGMENT IF REQUIRED AND SUFFICIENT POTABLE WATER TO PRODUCE A WORKABLE MIX. REPLACEMENT TERRAZZO TOPPING MIX TO MATCH EXISTING IN MATRIX COLOR, CHIP COLOR AND CHIP SIZE.
- 6) INSTALLATION: PLACE UNDER BED AND SCREED TO 1/2" BELOW FINISHED SURFACE. INSTALL DIVIDER STRIPS AND RESET GRANITE INSERTS BEFORE CONCRETE HARDENS. SOAK SURFACE OF UNDER BED WITH CLEAN WATER, PLACE RUSTIC TERRAZZO 1/2" DEEP, ROLL AND COMPACT SURFACE UNTIL EXCESS CEMENT AND WATER HAS BEEN EXTRACTED. FINISH EXPOSED AGGREGATE BY HOSEING, ABSORBENT ROLLING, OR USE OF A RETARDER. CURE BY FLOODING WITH CLEAN WATER, OR COVER WITH 4-MIL POLYETHYLENE SHEETING. CLEAN SURFACE WHEN IN THE OPINION OF THE TERRAZZO INSTALLER TOPPING IS SUFFICIENTLY CURED, APPLY A ONE TO TEN SOLUTION OF MURIATIC ACID IN WATER, SCRUB WITH A STIFF BROOM TO REMOVE LAITANCE AND RINSE IMMEDIATELY WITH CLEAN WATER TO REMOVE TRACES OF THE ACID. NOTE: ACID WASH NO SOONER THAN SEVEN DAYS AFTER INSTALLATION. SEAL SURFACE BY FIRST RINSING WITH CLEAN WATER THEN APPLY SEALER IN ACCORDANCE WITH MANUFACTURER'S DIRECTION FOR USE ON RUSTIC TERRAZZO.

D FRONT RANGE TERRAZZO PANORAMA
D3 No Scale



Know what's below
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ACCESSIBLE RAMP RAILING MATERIAL, FINISH AND FABRICATION SPECIFICATION:

Base Plates:

BASE PLATES ARE TO BE 4" SQUARE BY 1/2" THICK AND FABRICATED OUT OF TYPE 304 STAINLESS STEEL. SECURED TO CONCRETE SURFACE WITH TWO 6" BY 2" BY 1/2" EMBED J-BOLT ANCHORS PER PLATE. WELD POST TO BASES CONTINUOUS AND GRIND SMOOTH. BEVEL TOP CORNER 1/4" ALL SIDES.

Posts:

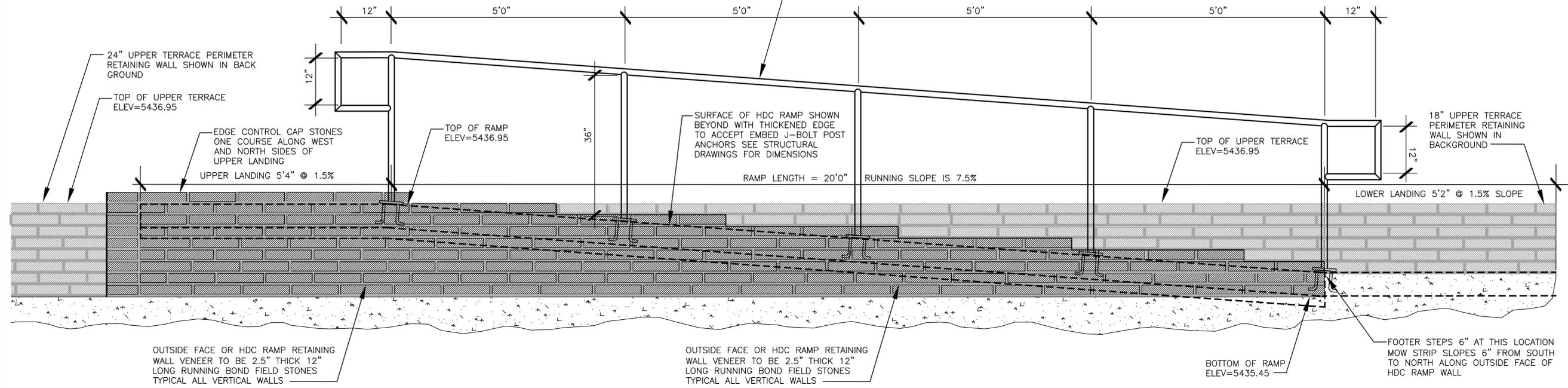
POSTS ARE TO BE 3'0" LONG AND FABRICATED OUT OF 1 1/2" O.D. TYPE 304 STAINLESS STEEL WITH 1/4" WALL 3,338 POUNDS PER FOOT. ALL WELDS ARE TO BE CONTINUOUS AND GRIND SMOOTH. POST SURFACES ARE TO RECEIVE A BEAD BLASTED MATT FINISH.

Railing:

RAILS ARE TO BE 22'0" LONG AND FABRICATED OUT OF 1 1/2" O.D. TYPE 304 STAINLESS STEEL WITH 1/4" WALL 3,338 POUNDS PER FOOT. ALL WELDS ARE TO BE CONTINUOUS AND GRIND SMOOTH. RAIL SURFACES ARE TO RECEIVE A BEAD BLASTED MATT FINISH.

ACCESSIBLE RAMP RAILINGS ARE REQUIRED ON BOTH SIDES OF RAMP TWO REQUIRED. THE OUTSIDE RAILING HAS A CENTER LINE RADIUS OF 30'6" THE INSIDE RAILING HAS A CENTER LINE RADIUS OF 27'2" CONTRACTOR TO CONFIRM RADIUS DIMENSIONS PRIOR TO FABRICATION.

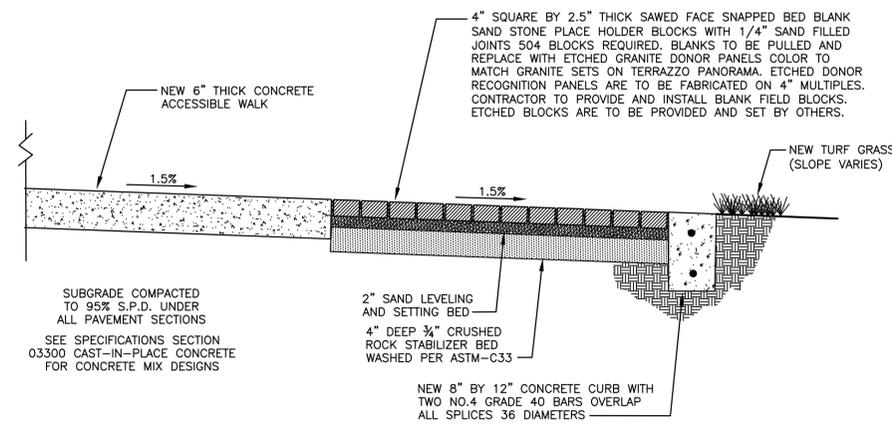
EMBED BASE PLATES SO OUTSIDE EDGE OF PLATE IS 2" FROM OUTSIDE EDGE OF CONCRETE RAMP SETTING POST, RAIL AND J-BOLT CENTER LINE 4" FROM OUTSIDE EDGE OF RAMP. ACCESSIBLE WAY WIDTH = 36". SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO ANY FABRICATION.



Scale: 1" = 1'

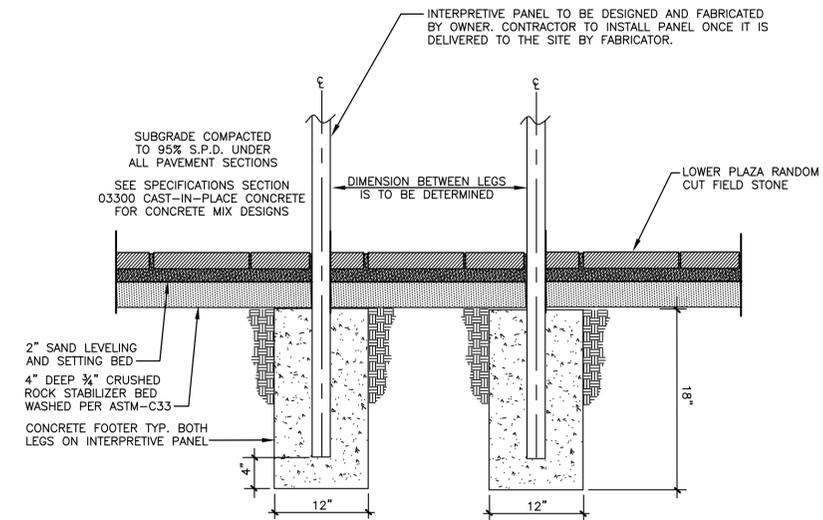
A SOUTHWEST WALL ELEVATION WITH ACCESSIBLE ACCESS RAMP

D4 No Scale:



B DONOR RECOGNITION BLANK FIELD SECTION

D4 No Scale



C INTERPRETIVE PANEL INSTALLATION DETAIL

D4 No Scale

Denver Parks + Recreation

PROJECT: Cranmer Park Sun Dial Terrace Reconstruction
SHEET TITLE: Detail Plan

PROJECT NO.: 2016-PROJMSTR-0000573

SCALE: N.A.

DESIGNED BY: ADS

DRAWN BY: ADS

CHECKED BY: MEH

DATE: 01-15-17

REVISIONS:
02-15-17
02-20-17

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
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SHEET NO: D-4

STRUCTURAL GENERAL NOTES

1. APPLICABLE CODES & STANDARDS
 - A. 2006 International Building Code with City and County of Denver Amendments
 - B. A.C.I. 318-05 Building Code Requirements for Structural Concrete and Commentary (318R-05)
2. LIVE LOADS USED IN DESIGN:
 - A. Live Load (Public Assembly).....100 psf
 - B. Wind90 MPH (3 sec. gust), Exposure C.
 - C. SeismicSite Class C (IBC Classification)
3. SOIL DATA USED IN DESIGN:
 - A. Allowable Soil Bearing Pressure – Footings
 - 1) On undisturbed subgrade or compacted structural fill 1,500 psf
 - B. Wall backfill pressure (At-Rest Equivalent Fluid)69 psf
 - C. Lateral Soil Resistance
 - 1) Coefficient of Friction..... 0.30
 - 2) Passive Pressure (Equivalent Fluid)..... 360 psf
 - D. Foundation design based on Ground Engineering Consultants, Inc. Subsurface Exploration Program Geotechnical Recommendations, Job Number 08-3573, dated March 26, 2008.
4. EXCAVATION AND BACKFILL:
 - A. All footing foundations shall bear on undisturbed native subgrade or on compacted structural fill acceptable to Geotechnical Engineer. Refer to the Geotechnical Engineer for requirements and additional information.
 - B. A qualified Geotechnical Engineer shall inspect the open excavations to verify the subgrade bearing materials, perform compaction tests and approve compaction.
 - C. Backfill material shall be thoroughly compacted in accordance with the Geotechnical Report.
 - D. Backfill foundation walls uniformly (max. 1 ft. differential) on all sides until reaching final grades and thoroughly compact at optimum moisture content. Do not backfill until all concrete has reached a field compressive strength of 3000 psi, with a minimum period of 7 days prior to backfilling.
 - E. The water table shall be kept below and away from the level of construction in all cases.
 - F. The condition and moisture content of the foundation bearing surfaces are to be kept stable and well-drained until the structures are complete and backfilled. See geotechnical report for additional information. Do not allow surface water to pond on the site.
5. CONCRETE:
 - A. Design and construction shall be in accordance with ACI Building Codes (ACI 318-05 and ACI 301 – latest revision).
 - B. All concrete shall develop 4,000 psi (f'c) compressive strength within 28 days unless otherwise noted, see specifications. Use Type I or II cement.
 - C. All concrete shall be normal weight stone aggregate.
 - D. See Landscape, Architectural, Mechanical & Electrical drawings for size & location of drains, holes, sleeves, reglets, washers, bolts, notches, drips, anchor, inserts, etc.
 - E. Embed continuous, full height vertical galvanized dovetail anchor slots in all concrete wall surfaces to receive a stone veneer. Locate the anchor slots at 6 inches from wall ends and corners and at 16 inches maximum on center throughout wall. Refer to Specifications and Drawings for additional information.
 - F. In footings, all construction joints shall be keyed with reinforcing continuous. Maximum length of pour in footings without offsets shall be fifty-five (55) feet unless noted otherwise.
 - G. Use air-entrained concrete, as called for in the specifications.
 - H. Verify need for chamfers at any exposed corners of concrete with Architect.
6. REINFORCEMENT:
 - A. Design, detailing, fabrication and placement shall be in accordance with ACI Codes and Manuals (ACI 318-05, ACI 315 latest revision).
 - B. Steel reinforcement shall be new, deformed billet steel, meeting ASTM Standard A615 (latest revision), for all rebar, Grade 60 unless noted otherwise. Shop drawings shall be marked accordingly.
 - C. Foundation walls continuing through T or cross intersections must have continuous horizontal reinforcement, or class B tension lap splice provided. Where horizontal bar elevations vary, the horizontal bars in shallower section must extend class B tension lap splice plus the bar spacing into deeper foundation walls. Foundation walls terminating at T intersection or corners must have #5 horizontal corner bars with 2'-6" legs.
 - D. Lap all tension splices per "Required Reinforcing Bar Tension Lap Splice Lengths" schedule on this drawing.
 - E. Provide concrete protection for reinforcement as follows:
 - 1) Concrete poured against earth 3"
 - 2) Concrete poured in forms but exposed to ground or weather:
 - a. Bars larger than #5 2"
 - b. Bars #5 or smaller 1-1/2"
 - 3) Walls and slabs unless noted otherwise 1-1/2"
 - F. Provide plastic accessories for all concrete surfaces exposed to weather, view, soil or liquids.
 - G. Tack welding or welding of rebar shall not be permitted unless otherwise reviewed and acceptable to the Engineer. All bars indicated on the plans to be welded shall conform to ASTM A706 (Grade 60).
 - H. Welded wire fabric shall be in accordance with ASTM A185.

7. STONE MASONRY:
 - A. Stone masonry veneer and capstones shall be as specified by Landscape Architect.
 - B. Mortar shall be type S. See Specifications.
8. SUBMITTAL REQUIREMENTS:
 - A. Reinforcing bar shop drawings for all concrete work prior to fabrication.
 - B. Concrete mix design prior to any concrete placement.
 - C. Mortar mix design for all stone masonry work prior to placement.
9. GENERAL REQUIREMENTS:
 - A. General Structural Notes shall be used along with specifications. Structural details are applicable where indicated by section cut, by note or by detail title. Provide similar details at similar conditions, u.n.o. Where the general structural notes, drawings, plan notes, details or specifications disagree, the contractor may request a clarification during the bidding period; otherwise, the more stringent requirements shall control. The cost of design work resulting from construction errors/omissions shall be borne by the contractor.
 - B. The structural drawings show the completed project. They do not include components that may be necessary for construction safety. The contractor is responsible for safety on and around the job site during construction. Provide all sequencing, temporary bracing, shoring, guying or other means to avoid excessive stresses & to hold structural elements in place during construction.
 - C. Engineering design provided by others & submitted for review shall bear the seal and signature of a Professional Engineer registered in the State of Colorado. Changes to the design of the structure that are proposed by the contractor shall be submitted to the Engineer for review. Engineer's acceptance must be secured prior to all substitutions or changes. The contractor shall be responsible for the coordination of all structural and non-structural elements affected by the proposed change. The cost of any design work necessitated by such a proposed change shall be borne by the contractor.
 - D. Contractor is required to verify and coordinate all dimensions and conditions of new construction prior to starting work. Notify the Engineer of any discrepancies or inconsistencies. Establish and verify all openings and inserts for mechanical, electrical and plumbing with the appropriate trades, drawings and subcontractors prior to construction.

REQUIRED REINFORCING BAR TENSION LAP SPLICE LENGTHS (INCHES)				
FOR CONCRETE STRENGTHS OF 4000 PSI TO 4500 PSI AND 2" CONCRETE COVER	REINFORCEMENT WITH MORE THAN 12 IN. CONCRETE CAST BELOW SPLICE		ALL OTHER REINFORCEMENT	
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED
#3	24	16	24	16
#4	30	20	24	16
#5	38	25	29	19
#6	44	29	35	23
#7	65	43	50	33
#8	74	49	56	37
#9	90	60	69	46
#10	111	74	86	57

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SDG Incorporated
Consulting Structural Engineers
333 West Hampden Ave., Suite 700
Englewood, CO 80110-2337
PH. 303/781-7070 FAX 303/781-4286

SDG Project No. 08007.0-P2



Denver Parks + Recreation

PROJECT: Cranmer Park Sun Dial Terrace Reconstruction

SHEET TITLE: Structural General Notes

PROJECT NO.: 2016-PROJMSTR-0000573

SCALE: As Noted

DESIGNED BY: SDG

DRAWN BY: DHB

CHECKED BY: EMS

DATE: 02-28-17

REVISIONS:

PREPARED BY:
Applied Design Services
9721 Bayou Ridge Trail
Parker, Colorado 80134
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Fax - 841-8191

SHEET NUMBER: S1



Know what's below
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Denver Parks + Recreation

PROJECT: Cranmer Park Sun Dial Terrace Reconstruction
SHEET TITLE: Foundation / East-West Step Sections & Details

PROJECT NO.: 2016-PROJMSTR-0000573
SCALE: As Noted
DESIGNED BY: SDG
DRAWN BY: DHB
CHECKED BY: EMS
DATE: 02-28-17
REVISIONS:

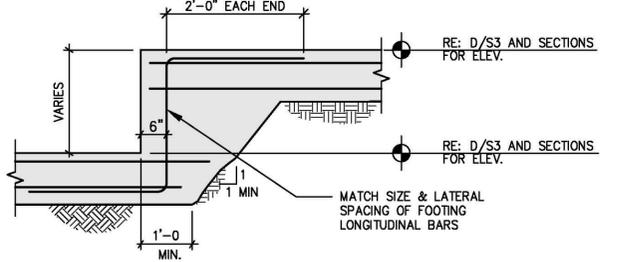
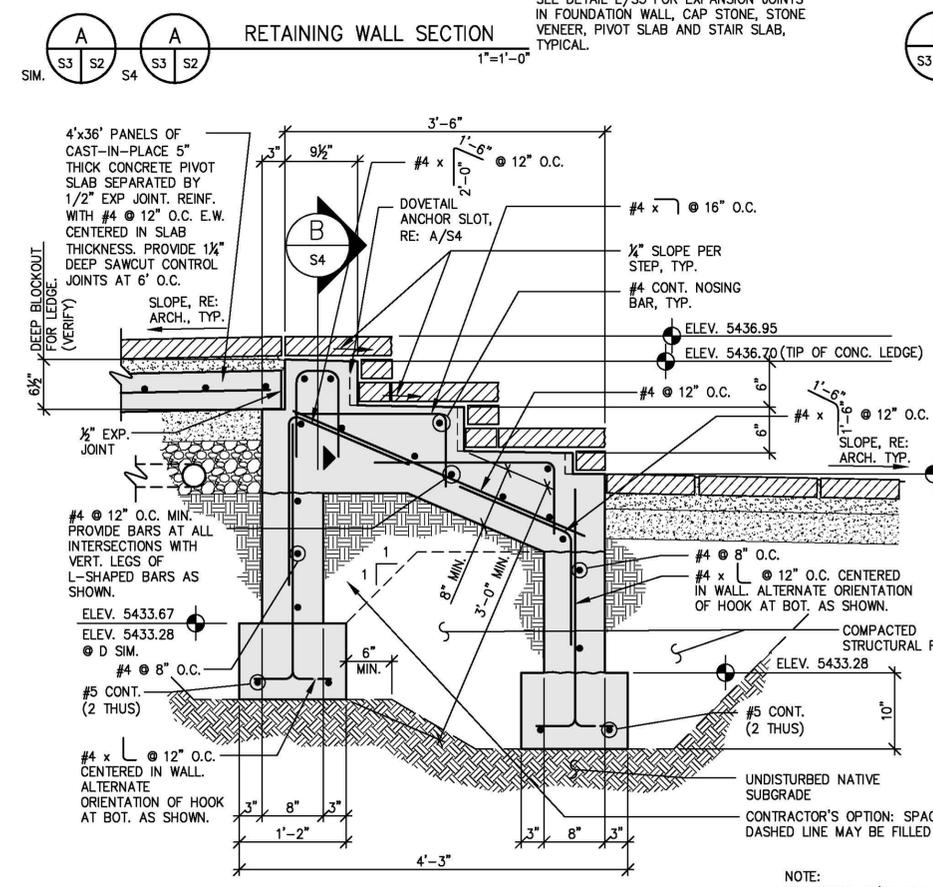
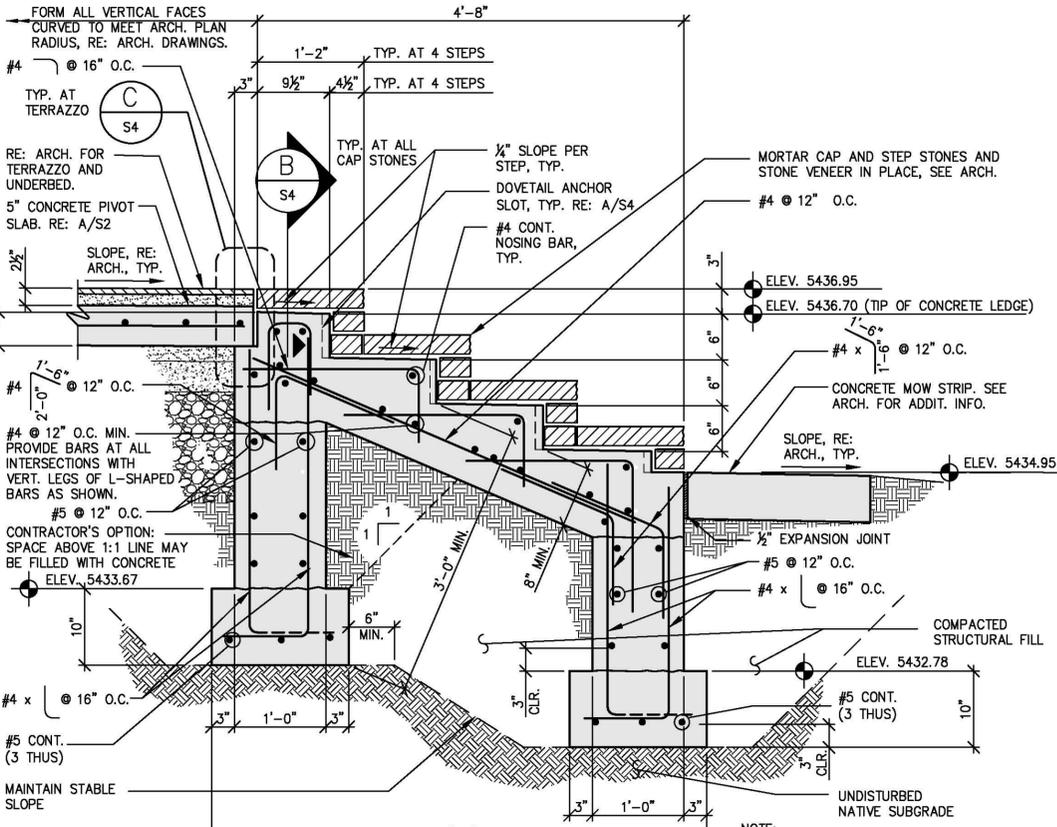
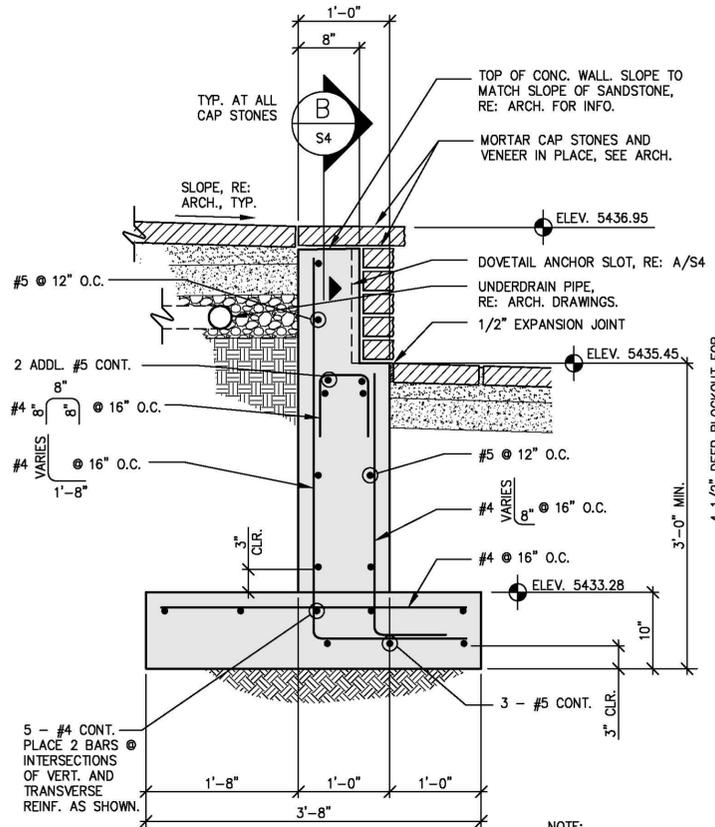
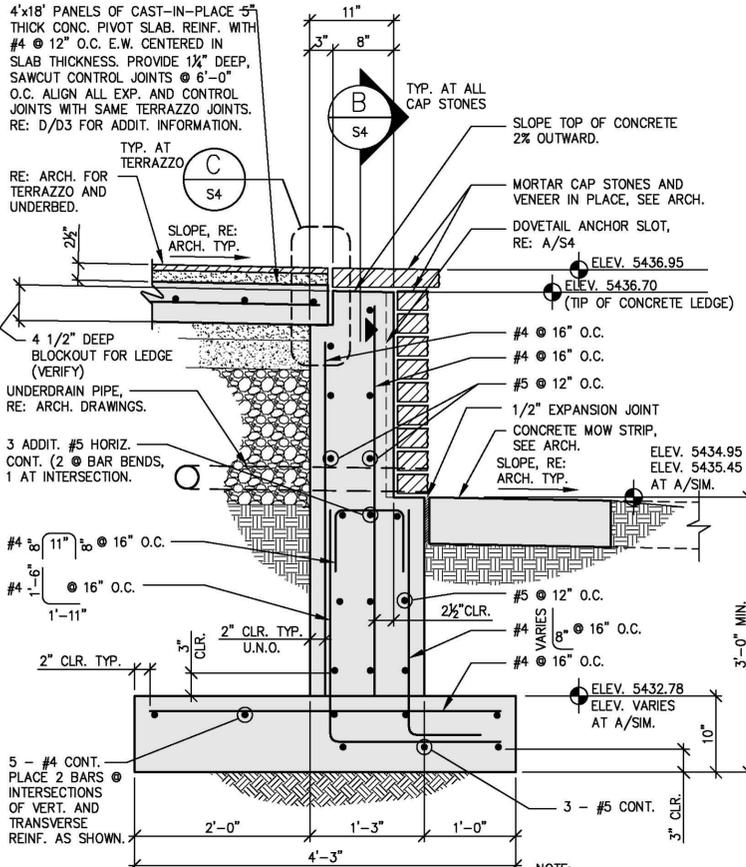
PREPARED BY:
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Fax - 841-8191

SHEET NUMBER: S2

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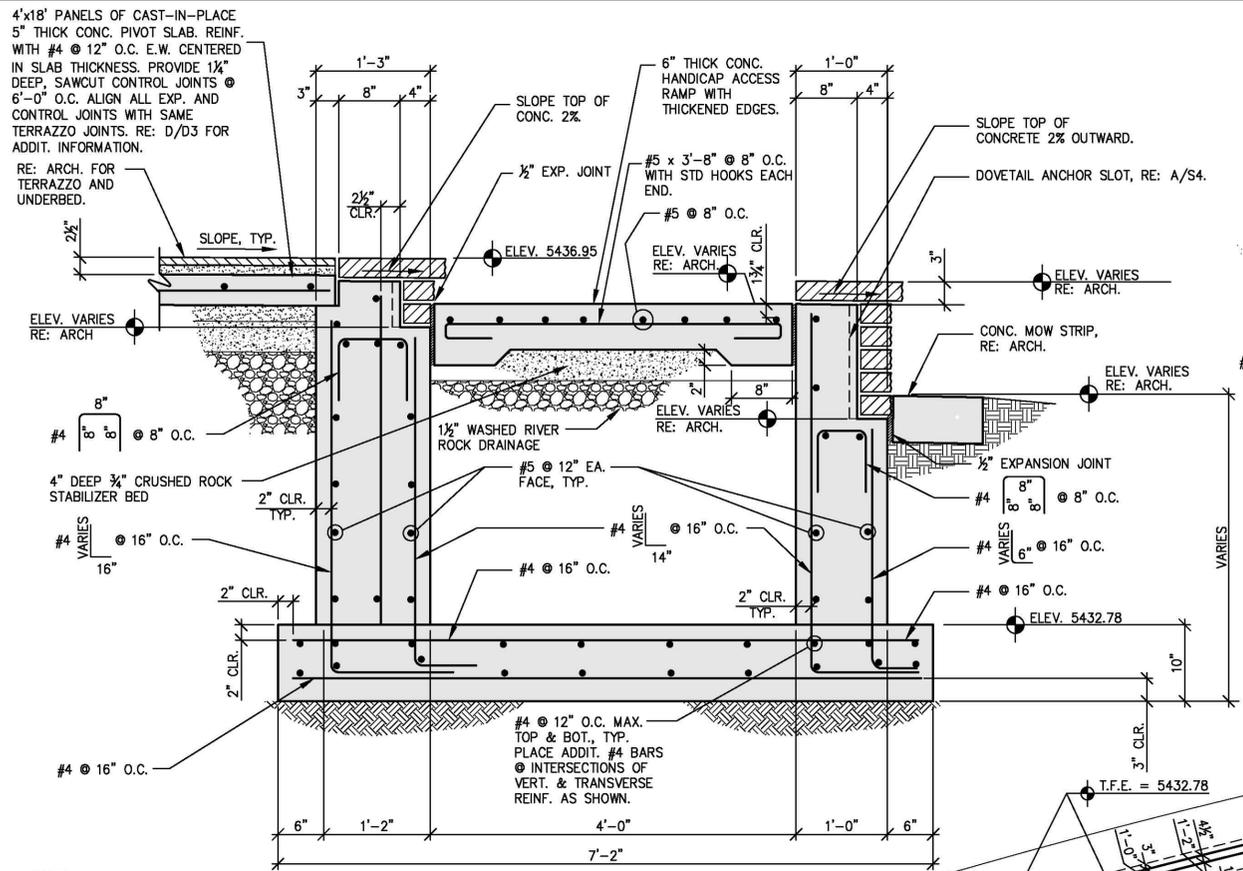
SDG Incorporated
Consulting Structural Engineers
333 West Hampden Ave., Suite 700
Englewood, CO 80110-2337
PH. 303/781-7070 FAX 303/781-4286

SDG Project No. 08007.0-P2

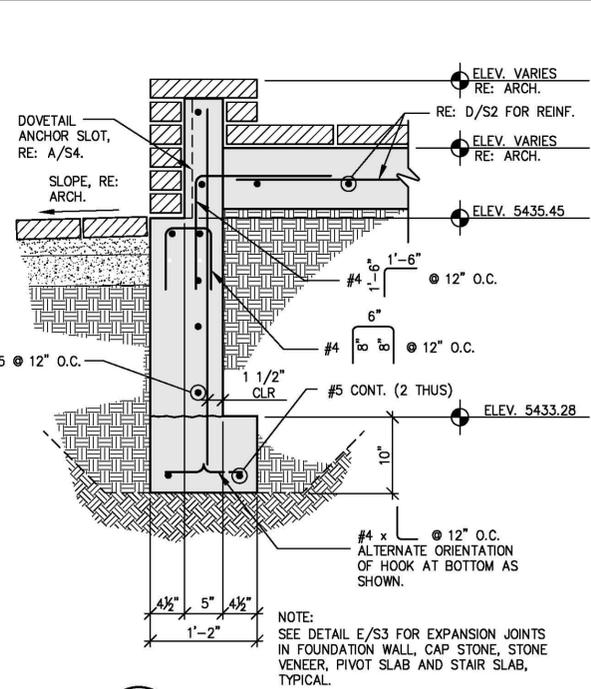


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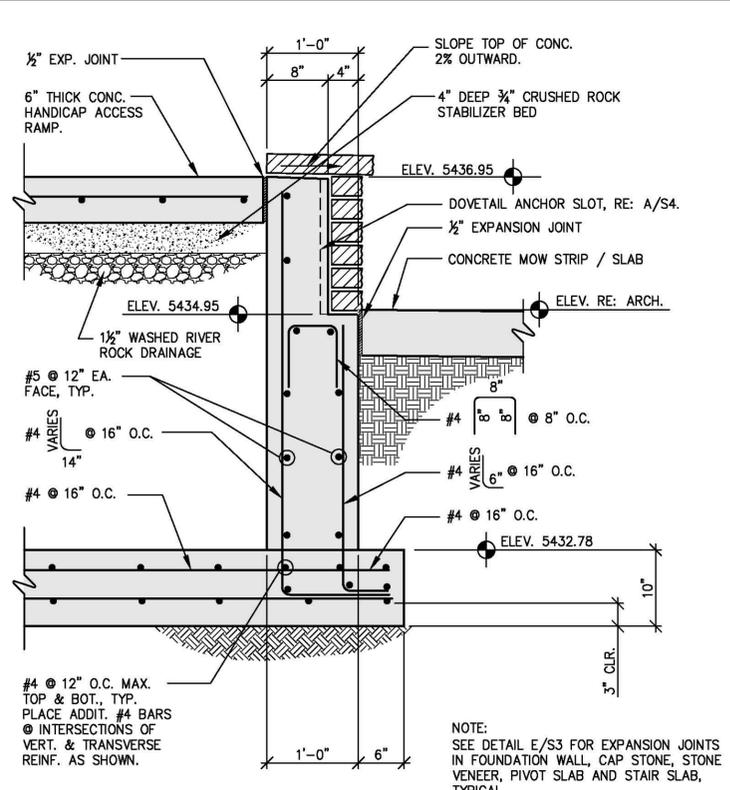
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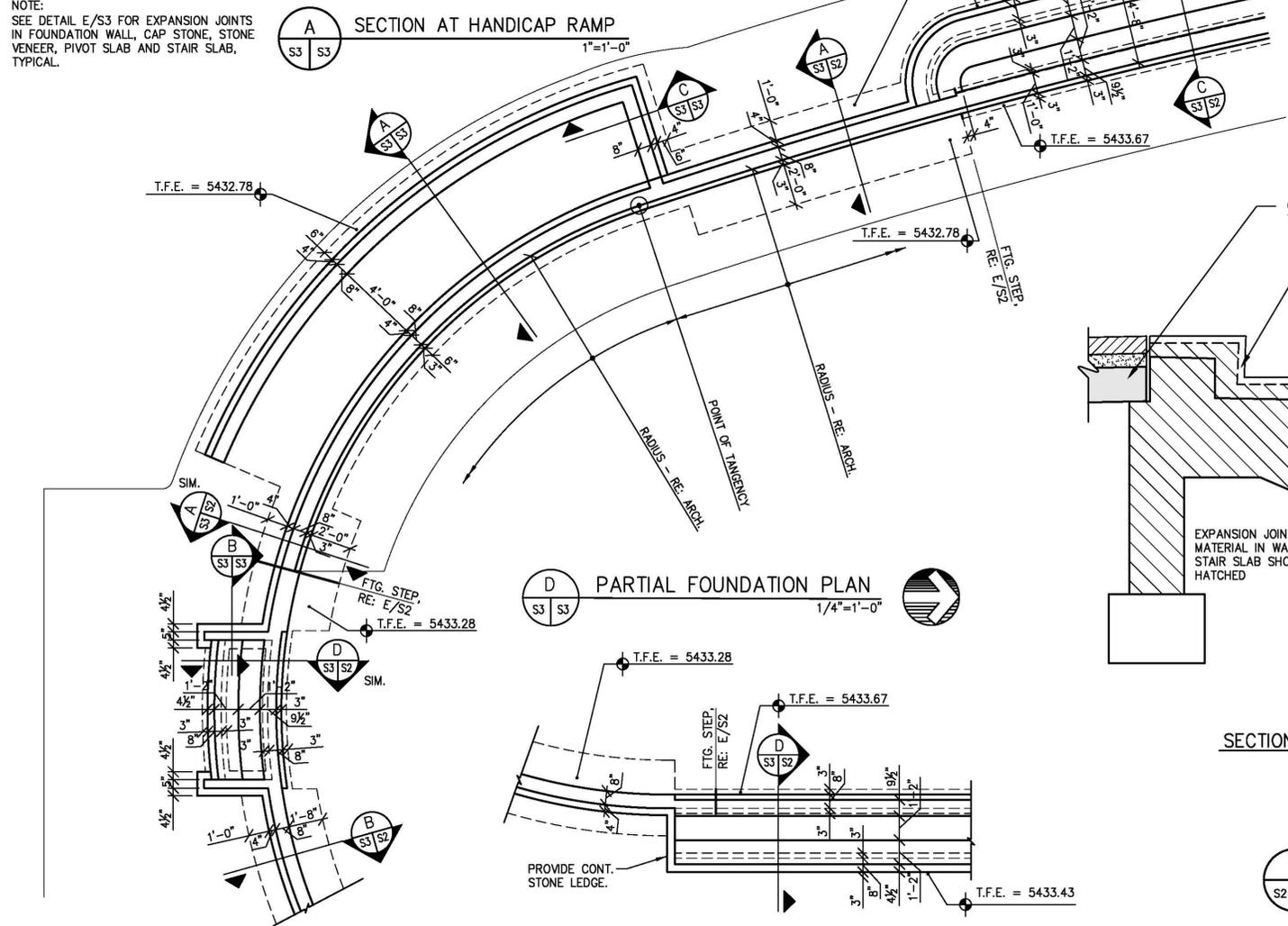
A SECTION AT HANDICAP RAMP
1"=1'-0"



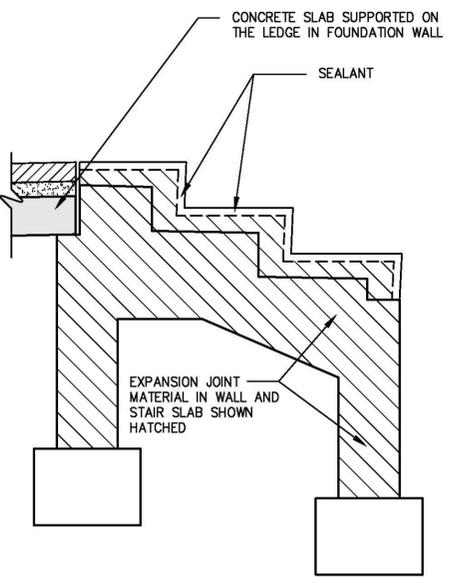
B SECTION AT STEPS SIDEWALL
1"=1'-0"



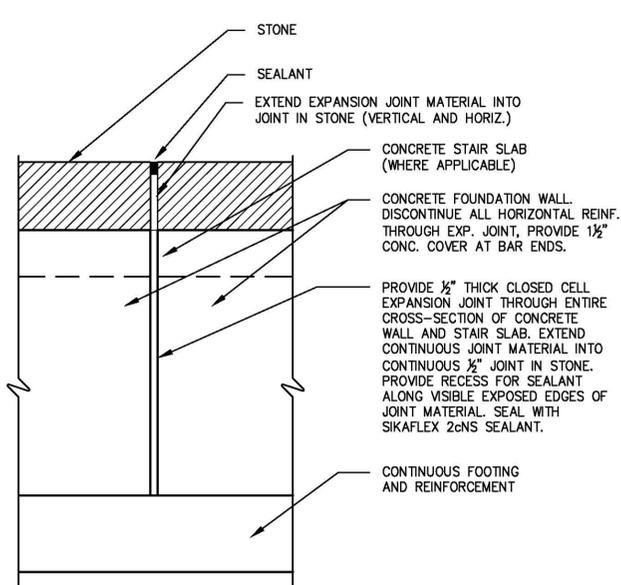
C SECTION AT HANDICAP RAMP END
1"=1'-0"



D PARTIAL FOUNDATION PLAN
1/4"=1'-0"



SECTION



ELEVATION

E TYP. WALL/STAIR EXPANSION JOINT DETAIL
N.T.S.

NOTE: PROVIDE AT 36 FT. ON CENTER. ALIGN WITH EXPANSION JOINTS IN PIVOT SLAB SUPPORTED ON THE LEDGE IN FOUNDATION WALL, WHERE SLAB OCCURS.

NOTE: SEE DETAIL E/S3 FOR EXPANSION JOINTS IN FOUNDATION WALL, CAP STONE, STONE VENEER, PIVOT SLAB AND STAIR SLAB, TYPICAL.

4'x18' PANELS OF CAST-IN-PLACE 5" THICK CONC. PIVOT SLAB REINF. WITH #4 @ 12" O.C. E.W. CENTERED IN SLAB THICKNESS. PROVIDE 1 1/4" DEEP SAWCUT CONTROL JOINTS @ 6'-0" O.C. ALIGN ALL EXP. AND CONTROL JOINTS WITH SAME TERRAZZO JOINTS. RE: D/D3 FOR ADDIT. INFORMATION.

RE: ARCH. FOR TERRAZZO AND UNDERBED.



Denver Parks + Recreation

Project: Cranmer Park Sun Dial Terrace Reconstruction

SHEET TITLE: Foundation / Handicap Ramp Partial Plan - Sections & Details

PROJECT NO.:	2016-PROJMSTR-0000573
SCALE:	As Noted
DESIGNED BY:	SDG
DRAWN BY:	DHB
CHECKED BY:	EMS
DATE:	02-28-17
REVISIONS:	

PREPARED BY:
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9721 Bayon Ridge Trail
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SDG Project No. 08007.0-P2

SHEET NUMBER: S3



Know what's below
Call before you dig.

Denver Parks + Recreation

SHEET TITLE:
Sundial Section and Plan
Sections & Details

PROJECT:
Cranmer Park Sun Dial
Terrace Reconstruction

PROJECT NO.:
2016-PROJMSTR-0000573

SCALE: As Noted

DESIGNED BY: SDG

DRAWN BY: DHB

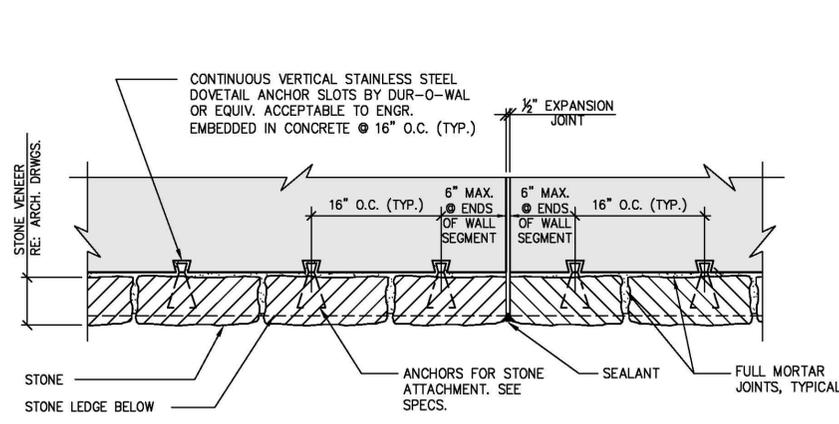
CHECKED BY: EMS

DATE: 02-28-17

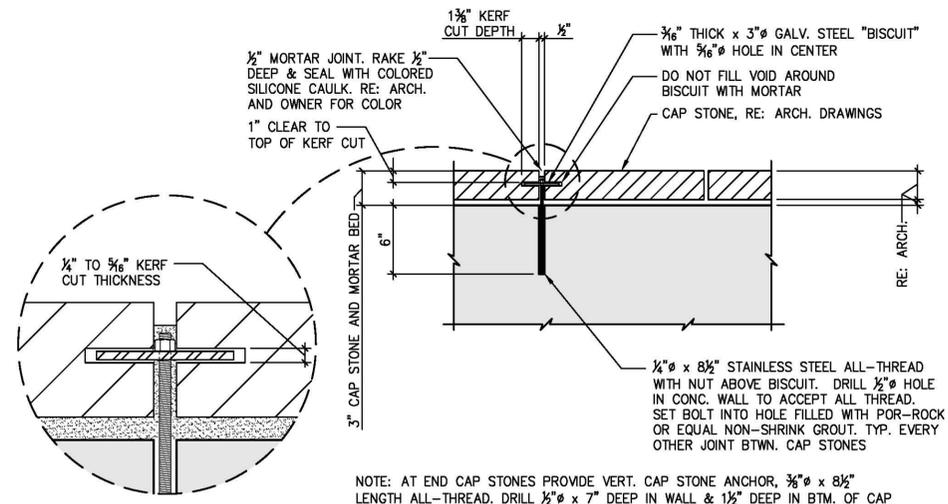
REVISIONS:

PREPARED BY:
Applied Design Services
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SHEET NUMBER: S4

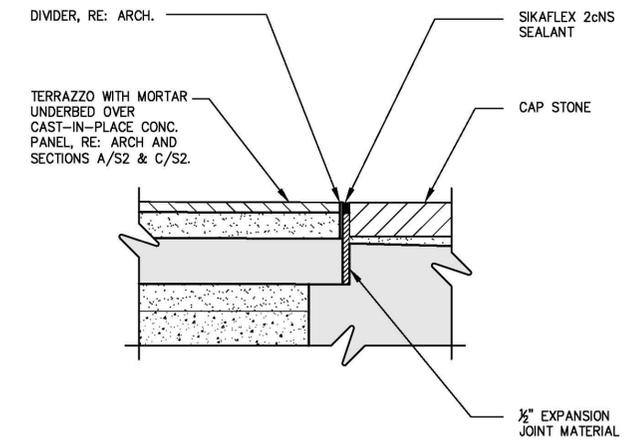


A TYP. DOVETAIL ANCHOR SLOT DETAIL
S2 S3 S4 N.T.S.



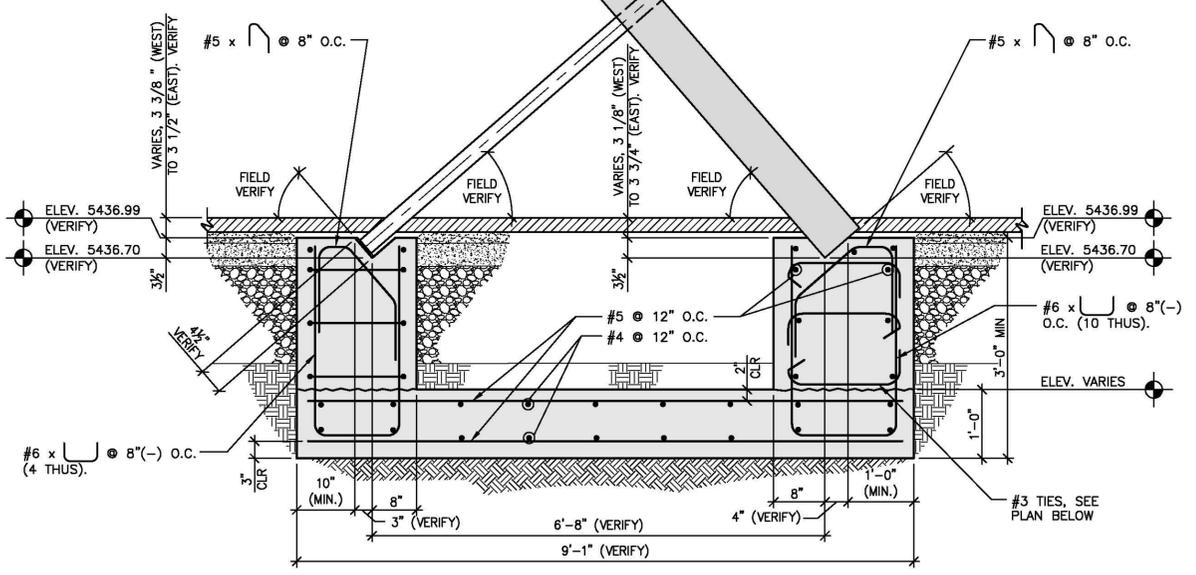
NOTE: AT END CAP STONES PROVIDE VERT. CAP STONE ANCHOR, 3/8" x 8 1/2" LENGTH ALL-THREAD. DRILL 1/2" x 7" DEEP IN WALL & 1 1/2" DEEP IN BTM. OF CAP STONE. SET ANCHOR INTO HOLE FILLED WITH POR-ROCK OR EQUAL NON-SHRINK GROUT. PROVIDE 2 ANCHORS PER END CAP STONE.

B CAP STONE ANCHOR DETAIL
S2 S4 N.T.S.



C EXPANSION JOINT @ TERRAZZO/CAP STONE
S2 S4 N.T.S.

NOTE:
1. VERIFY ALL DIMENSIONS, ANGLES AND ELEVATIONS PRIOR TO REMOVAL OF SUNDIAL FOR REFRUBISHMENT.
2. SHIM AS NECESSARY WHEN SETTING SUNDIAL. GROUT FILL POCKETS AT TOP OF SUPPORTS TO TOP OF TRIANGULAR POCKETS.



D SUNDIAL SECTION AND PLAN
S4 S4 3/4"=1'-0"

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Jun 6, 2017 - 6:05pm G:\Autocad\Save\Ae\Publish_2876\S4.dwg