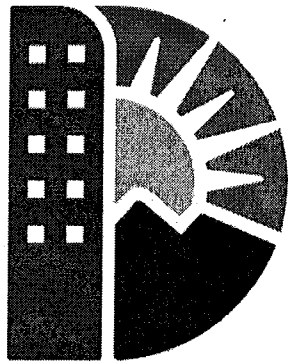


CITY AND COUNTY OF DENVER

STATE OF COLORADO



DENVER[®]
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS/ PARKS AND RECREATION DIVISION

BID DOCUMENTS PACKAGE

Contract No. 201100726

**SWANSEA PARK - MASTER PLAN & IRRIGATION
IMPROVEMENTS**

May 4, 2011



DENVER
THE MILE HIGH CITY

Department of Public Works
Engineering Division

Capital Projects Management – Dept. 506
Right-of-Way Services – Dept. 507
Policy and Planning – Dept. 509
Traffic Engineering Services – Dept. 508

201 West Colfax Avenue
Denver, CO 80202
www.Work4Denver.com

NOTICE OF APPARENT LOW BIDDER

T2 Construction, Inc.
5435 W. 59th Ave., Unit H
Arvada, CO 80003

The MANAGER OF PUBLIC WORKS has considered the Bids submitted on **June 2, 2011**, for work to be done and materials to be furnished in and for:

PROJECT NO 201100726 SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

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: **01010-1 through 02960-6 (Thirty-Six [36]) plus Add Alternates One through Seven (Twenty-Four [24]) for a total of Sixty [60] items**, the total estimated cost thereof being: **Six Hundred Two Thousand One Hundred Forty Dollars and Ten Cents (\$602,140.10)**

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 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;
- b. One original plus two copies of the 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 B1.12.2 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


PROJECT NO. 201100726

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 13th day of June 2011.

CITY AND COUNTY OF DENVER

By 
for George Delaney
Manager of Public Works

MK/tmg

cc: H. Woods (CAO), Gallagher (AUD), Schellinger (Treasury/Tax Compliance), DSBO Inbox, Gregory Cieciek, Tabor, Merritt (PW-Aud), File.

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Parks and Recreation**

BID FORM AND SUBMITTAL PACKAGE ACKNOWLEDGMENT

CONTRACT NO. 201100726

SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

BIDDER:

TA Construction Inc.

ADDRESS:

5135 W. 57th Ave
Unit H
Durango CO
81123

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. 201100726, SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS**, made available to the undersigned bidder pursuant to Notice of Invitation for Bids dated May 4, 2011.

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
- SBE Commitment Form and List of Proposed Participants
- Joint Venture Affidavit (if applicable)
- Joint Venture Eligibility Form (if applicable)
- Bid Bond
- Bidder / Contractor / Vendor / Proposer Disclosure Form

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

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: 12 Construction

By: [Signature]

Title: President

ATTEST:

By: [Signature]

[SEAL]

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Parks and Recreation**

BID FORM

CONTRACT NO. 201100726

SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

BIDDER T2 Construction Inc.

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 **May 4, 2011**, to furnish all required materials, tools, appliances, equipment and plant; to perform all necessary labor and to undertake and complete: **CONTRACT NO. 201100726, SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS**, 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 SBE Participation/List of Proposed Participants/Letters of Intent
Article VII 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 Drawings

Item No.	Description and Price	Estimated Quantity	Estimated Cost
01010-1	Mobilization at the unit price of \$ <u>34,100.00</u> per LUMP SUM.	1 LS	\$ <u>34,100.00</u>
01050-1	Construction Surveying at the unit price of \$ <u>3,942.00</u> per LUMP SUM.	1 LS	\$ <u>3,942.00</u>
01400-1	Materials Testing at the unit price of \$ <u>5,000.00</u> per LUMP SUM.	1 LS	\$ <u>5,000.00</u>
01500-1	6' High Portable Chain Link Fence with Gate at the unit price of \$ <u>2.20</u> per LINEAR FOOT.	1,195 LF	\$ <u>2,629.00</u>
01565-1	Silt Fence at the unit price of \$ <u>1.40</u> per LINEAR FOOT.	1,000 LF	\$ <u>1,400.00</u>
01565-2	Stabilized Staging Area at the unit price of \$ <u>2,800.00</u> per LUMP SUM.	1 LS	\$ <u>2,800.00</u>
01565-3	Vehicle Tracking Control at the unit price of \$ <u>3,600.00</u> per LUMP SUM.	1 LS	\$ <u>3,600.00</u>
01565-4	Concrete Chute Washout at the unit price of \$ <u>1,100.00</u> per LUMP SUM.	1 LS	\$ <u>1,100.00</u>
02050-1	Remove Concrete Paving at the unit price of \$ <u>2,300.00</u> per LUMP SUM.	1 LS	\$ <u>2,300.00</u>
02050-2	Remove Asphalt Paving at the unit price of \$ <u>10,900.00</u> per LUMP SUM.	1 LS	\$ <u>10,900.00</u>
02050-3	Remove Infield Mix and Backstop at the unit price of \$ <u>4,000.00</u> per LUMP SUM.	1 LS	\$ <u>4,000.00</u>
02050-4	Relocate Players Benches at the unit price of \$ <u>100.00</u> per EACH.	2 EA	\$ <u>200.00</u>
02050-5	Remove Bollards at the unit price of \$ <u>120.00</u> per LUMP SUM.	1 LS	\$ <u>120.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
02050-6	Remove Sod at the unit price of \$ <u>.54</u> per SQUARE FOOT.	877 SF	\$ <u>473.58</u>
02050-7	Remove Guardrail at the unit price of \$ <u>2,100.00</u> per LUMP SUM.	1 LS	\$ <u>2,100.00</u>
02150-1	Tree Protection Fencing at the unit price of \$ <u>.75</u> per LINEAR FOOT.	6,500 LF	\$ <u>4,875.00</u>
02200-1	Earthwork at the unit price of \$ <u>14,000.00</u> per LUMP SUM.	1 LS	\$ <u>14,000.00</u>
02520-1	Concrete Pavement (6" thick) at the unit price of \$ <u>3.60</u> per SQUARE FOOT.	17,100 SF	\$ <u>61,560.00</u>
02520-3	Thickened Edge Concrete at the unit price of \$ <u>16.80</u> per LINEAR FOOT.	85 LF	\$ <u>1,428.00</u>
02520-5	Concrete Curb and Gutter at the unit price of \$ <u>16.00</u> per LINEAR FOOT.	90 LF	\$ <u>1,440.00</u>
02520-6	Concrete Mow Curb at the unit price of \$ <u>14.00</u> per LINEAR FOOT.	15 LF	\$ <u>210.00</u>
02710-2	Drainage Improvements at New Baseball Field at the unit price of \$ <u>2,700.00</u> per LUMP SUM.	1 LS	\$ <u>2,700.00</u>
02740-1	Asphaltic concrete Paving at the unit price of \$ <u>8.00</u> per SQUARE FOOT.	144 SF	\$ <u>1,152.00</u>
02810-1	Removal of Existing Irrigation Equipment at the unit price of \$ <u>2,100.00</u> per LUMP SUM.	1 LS	\$ <u>2,100.00</u>
02810-2	Irrigation System Installation at the unit price of \$ <u>190,000.00</u> per LUMP SUM.	1 LS	\$ <u>190,000.00</u>
02810-3	Irrigation System Trench Boring at the unit price of \$ <u>14.00</u> per LINEAR FOOT.	800 LF	\$ <u>11,200.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
02810-4	Irrigation Antenna Supply at the unit price of \$ <u>4,000.00</u> per LUMP SUM.	1 LS	\$ <u>4,000.00</u>
02831-1	Backstop Fencing at the unit price of \$ <u>14,000.00</u> per LUMP SUM.	1 LS	\$ <u>14,000.00</u>
02865-2	Infield Mix Surfacing at the unit price of \$ <u>2.00</u> per SQUARE FOOT.	10,250 SF	\$ <u>20,500.00</u>
02932-1	Native Seeding at the unit price of \$ <u>.14</u> per SQUARE FOOT.	57,500 SF	\$ <u>8,050.00</u>
02932-2	Turf grass Seeding over Trenches at the unit price of \$ <u>8,400.00</u> per LUMP SUM.	1 LS	\$ <u>8,400.00</u>
02935-2	Sodding at the unit price of \$ <u>.47</u> per SQUARE FOOT.	55,000 SF	\$ <u>25,850.00</u>
02950-2	Wood Mulch at the unit price of \$ <u>.45</u> per SQUARE FOOT.	10,292 SF	\$ <u>4,631.40</u>
02960-2	Installation of Bases and Base Anchors at the unit price of \$ <u>1,100.00</u> per LUMP SUM.	1 LS	\$ <u>1,100.00</u>
02960-5	Installation of Removable Bollards at the unit price of \$ <u>700.00</u> per EACH.	3 EA	\$ <u>2,100.00</u>
02960-6	Installation of Post And Chain at the unit price of \$ <u>16.00</u> per LINEAR FOOT.	130 LF	\$ <u>2,080.00</u>
TOTAL BASE BID			\$ <u>456,040.⁹⁸</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
<u>BID ALTERNATE 1 - Baseball</u>			
<u>Outfield Fencing, Mow Curb and Gate</u>			
02831-2	Outfield Fencing and Gate at the unit price of \$ <u>23.50</u> per LINEAR FOOT.	700 LF	\$ <u>16,450.00</u>
02520-4	12" Concrete Mow Band at Outfield Fencing at the unit price of \$ <u>14.25</u> per LINEAR FOOT.	700 LF	\$ <u>9,975.00</u>
ALTERNATE #1 TOTAL			\$ <u>26,425.00</u>
<u>BID ALTERNATE 2 - Volleyball</u>			
<u>Concrete Loop Walk</u>			
02520-1	Concrete Pavement (6" thick) at the unit price of \$ <u>4.05</u> per SQUARE FOOT.	3,933 SF	\$ <u>15,928.65</u>
02050-6	Remove Sod at the unit price of \$ <u>.66</u> per SQUARE FOOT.	3,933 SF	\$ <u>2,595.78</u>
ALTERNATE #2 TOTAL			\$ <u>18,524.43</u>
<u>BID ALTERNATE 3 - Gateway</u>			
05500-1	Installation of Gateway at the unit price of \$ <u>15,000.00</u> per LUMP SUM.	1 LS	\$ <u>15,000.00</u>
ALTERNATE #3 TOTAL			\$ <u>15,000.00</u>
<u>BID ALTERNATE 4 - Basketball Court</u>			
02520-1	Concrete Pavement (6" thick) at the unit price of \$ <u>4.05</u> per SQUARE FOOT.	6,240 SF	\$ <u>25,272.00</u>
02960-1	Installation of Basketball Hoops and Court Striping at the unit price of \$ <u>5,200.00</u> per LUMP SUM.	1 LS	\$ <u>5,200.00</u>
02050-6	Remove Sod at the unit price of \$ <u>.62</u> per SQUARE FOOT.	6,240 SF	\$ <u>3,868.80</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
02810-2	Irrigation System Deduct at the unit price of \$ <u>(1,700.00)</u> per LUMP SUM.	-1 LS	\$ <u>(1,700.00)</u>
	ALTERNATE #4 TOTAL		\$ <u>32,640.⁸⁰</u>
<u>BID ALTERNATE 5 - Volleyball Courts</u>			
02050-6	Remove Sod at the unit price of \$ <u>1.32</u> per SQUARE FOOT.	5,982 SF	\$ <u>7,896.²⁴</u>
02520-2	Volleyball Curb wall at the unit price of \$ <u>17.50</u> per LINEAR FOOT.	225 LF	\$ <u>3,937.⁵⁰</u>
02520-3	Thickened Edge Concrete at the unit price of \$ <u>17.50</u> per LINEAR FOOT.	85 LF	\$ <u>1,487.⁵⁰</u>
02710-1	4" Diameter Perforated PVC SDR-35 Subsurface Drain at the unit price of \$ <u>5.00</u> per LINEAR FOOT.	70 LF	\$ <u>350.00</u>
02710-3	Dry Well at Volleyball at the unit price of \$ <u>700.00</u> per LUMP SUM.	1 LS	\$ <u>700.00</u>
02960-3	Volleyball Equipment at the unit price of \$ <u>1,650.00</u> per LUMP SUM.	1 LS	\$ <u>1,650.00</u>
02865-1	Sand Surfacing at the unit price of \$ <u>1.72</u> per SQUARE FOOT.	5,900 SF	\$ <u>10,148.00</u>
02810-2	Irrigation System Deduct at the unit price of \$ <u>(1,500.00)</u> per LUMP SUM.	-1 LS	\$ <u>(1,500.00)</u>
	ALTERNATE #5 TOTAL		\$ <u>24,669.²⁴</u>
<u>BID ALTERNATE #6 - Horseshoe Pit</u>			
02050-6	Remove Sod at the unit price of \$ <u>.66</u> per SQUARE FOOT.	390 SF	\$ <u>257.⁴⁰</u>
02960-4	Installation of Horseshoe Pit at the unit price of \$ <u>5,750.00</u> per LUMP SUM.	1 LS	\$ <u>5,750.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
02810-2	Irrigation System Deduct at the unit price of \$ <u>(800.00)</u> per LUMP SUM.	-1 LS	\$ <u>(800.00)</u>
	ALTERNATE #6 TOTAL		\$ <u>5,207.40</u>
<u>BID ALTERNATE 7 – Walk, Sod, Irrigation and Landscape @ New Baseball Field</u>			
02520-1	Concrete Pavement (6" thick) at the unit price of \$ <u>4.05</u> per SQUARE FOOT.	2,125 SF	\$ <u>8,606.25</u>
02935-2	Sodding at the unit price of \$ <u>.48</u> per SQUARE FOOT.	8,700 SF	\$ <u>4,176.00</u>
02950-1	Trees at the unit price of \$ <u>325.00</u> per EACH.	18 EA.	\$ <u>5,850.00</u>
02810-2	Irrigation System Installation at the unit price of \$ <u>5,000.00</u> per LUMP SUM.	1 LS	\$ <u>5,000.00</u>
	ALTERNATE #7 TOTAL		\$ <u>23,632.25</u>

Total Base Bid Amount of:

FOUR HUNDRED FIFTY SIX THOUSAND FORTY DOLLARS
AND NINETY EIGHT CENTS
Dollars (\$ 456,040⁹⁸)

[Total base bid amount equals the sum of each estimated cost for item numbers 01010-1 through 02960-6 (36 items)]

ADD ALTERNATES:

Bid Alternate 1 Amount of:

TWENTY SIX THOUSAND FOUR HUNDRED
TWENTY FIVE
Dollars (\$ 26,425⁰⁰)

Bid Alternate 2 Amount of:

EIGHTEEN THOUSAND FIVE HUNDRED TWENTY FOUR DOLLARS
AND FORTY THREE CENTS
Dollars (\$ 18,524⁴³)

Bid Alternate 3 Amount of:

FIFTEEN THOUSAND
Dollars (\$ 15,000⁰⁰)

Bid Alternate 4 Amount of:

THIRTY TWO THOUSAND SIX HUNDRED FORTY DOLLARS AND
Eighty cents
Dollars (\$ 32,640⁸⁰)

Bid Alternate 5 Amount of:

TWENTY FOUR THOUSAND SIX HUNDRED SIXTY NINE DOLLARS
AND TWENTY FOUR CENTS
Dollars (\$ 24,669²⁴)

Bid Alternate 6 Amount of:

FIVE THOUSAND TWO HUNDRED SEVEN DOLLARS AND
FORTY CENTS
Dollars (\$ 5207⁴⁰)

Bid Alternate 7 Amount of:

TWENTY THREE THOUSAND SIX HUNDRED THIRTY TWO DOLLARS
AND TWENTY FIVE CENTS
Dollars (\$ 23,632²⁵)

SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS
SUPPLEMENTAL PRICING DISCLOSURE BID ITEM 02810-2

Hunter MP1000 on Rain Bird 1806-SAM-NP Body with Swing Joint Assembly	\$ <u>21⁰⁰</u> /EA
Hunter MP2000 on Rain Bird 1806-SAM-NP Body with Swing Joint Assembly	\$ <u>21⁰⁰</u> /EA
Hunter MP3000 on Rain Bird 1806-SAM-NP Body with Swing Joint Assembly	\$ <u>21⁰⁰</u> /EA
Hunter MP Corner on Rain Bird 1806-SAM-NP Body with Swing Joint Assembly	\$ <u>21⁰⁰</u> /EA
Hunter I-20-6P-SS-R - Ultra with Swing Joint Assembly	\$ <u>36⁰⁰</u> /EA
Hunter I-20-6P-SR-SS-R - Ultra with Swing Joint Assembly	\$ <u>36⁰⁰</u> /EA
Hunter I25-06-SS-R - Ultra with Swing Joint Assembly	\$ <u>52⁰⁰</u> /EA
Hunter I-40-06-SS-R - Ultra with Swing Joint Assembly	\$ <u>65⁰⁰</u> /EA
Rain Bird PESBR 1" Assembly	\$ <u>85⁰⁰</u> /EA
Rain Bird PESBR 1-1/2" Assembly	\$ <u>110⁰⁰</u> /EA
Rain Bird PESBR 2" Assembly	\$ <u>130⁰⁰</u> /EA
Buckner Q44LCAR10 1" Quick Coupler Assembly with Swing Joint	\$ <u>155⁰⁰</u> /EA
Gate Valve - Line Size 10	\$ <u>500⁰⁰</u> /EA
Stop and Waster Valve Assembly with Gravel Sump	\$ <u>250⁰⁰</u> /EA
Bermad 410 - 6" Master Valve Assembly	\$ <u>1500⁰⁰</u> /EA
Drain Valve Assembly with Gravel Sump	\$ <u>225⁰⁰</u> /EA
Toro Sentinel ESB-96-TW-U2-SB18SSPDDGGBL-VRA-FK 2-wire Controller Package with Grounding Assembly, and Enclosure	\$ <u>14,000⁰⁰</u> /EA
Toro EBS-BLD-1 Single Station Decoder Unit	\$ <u>180⁰⁰</u> /EA
Toro ESDLTSLA Lightning Arrestor and Grounding Assembly	\$ <u>225⁰⁰</u> /EA
Wireless Antenna System Package	\$ <u>3800⁰⁰</u> /EA
Paige Spec P7350D 2-Wire Control Wire	\$ <u>.60</u> /LF
14 AWG Direct Burial Wire	\$ <u>.18</u> /LF
10 AWG Direct Burial Wire	\$ <u>.25</u> /LF
Hunter WRC Rain Sensor	\$ <u>120⁰⁰</u> /EA
Date Industrial 220B - 6" Flow Sensor	\$ <u>650⁰⁰</u> /EA
Paige Spec P7171D-A Communication Cable	\$ <u>1⁰⁰</u> /LF
10" Round Valve Box	\$ <u>25⁰⁰</u> /EA
Jumbo Rectangular Valve Box	\$ <u>58⁰⁰</u> /EA
Super Jumbo Rectangular Valve Box	\$ <u>210⁰⁰</u> /EA
Bore Under Existing Pavement For New Sleeve	\$ <u>16⁰⁰</u> /LF
Irrigation Lateral Line: Polyethylene Pipe SDR-7 1"	\$ <u>175</u> /LF
Irrigation Lateral Line: Polyethylene Pipe SDR-7 1 1/2"	\$ <u>225</u> /LF

SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS
SUPPLEMENTAL PRICING DISCLOSURE BID ITEM 02810-2

Irrigation Lateral Line: Polyethylene Pipe SDR-7 2"	\$	<u>275</u>	/LF
Irrigation Lateral Line: Polyethylene Pipe SDR-7 2 1/2"	\$	<u>320</u>	/LF
Irrigation Lateral Line: Polyethylene Pipe SDR-7 3"	\$	<u>380</u>	/LF
Irrigation Mainline: PVC Class 200 Non-Potable 4"	\$	<u>6⁰⁰</u>	/LF
Irrigation Mainline: PVC Class 200 Non-Potable 6"	\$	<u>8⁸⁰</u>	/LF
PVC To HDPE Mainline Transition Adaptor Kit	\$	<u>225⁰⁰</u>	/EA
Harco Ductile Iron Fitting: Bend	\$	<u>110⁰⁰</u>	/EA
Harco Ductile Iron Fitting: Tee	\$	<u>180⁰⁰</u>	/EA
Harco Ductile Iron Fitting: Reducer	\$	<u>85⁰⁰</u>	/EA
Harco Ductile Iron Fitting: Cap or Dead End	\$	<u>68⁰⁰</u>	/EA
Harco Joint Restraint: Tee	\$	<u>225⁰⁰</u>	/EA
Harco Joint Restraint: Bend	\$	<u>150⁰⁰</u>	/EA
Harco Joint Restraint: Reducer	\$	<u>150⁰⁰</u>	/EA
Harco Joint Restraint: Valve To Pipe	\$	<u>334⁰⁰</u>	/EA
Harco Joint Restraint: Pipe To Pipe	\$	<u>150⁰⁰</u>	/EA
Harco Joint Restraint: Cap or Dead End	\$	<u>100⁰⁰</u>	/EA
Pipe Sleeve: PVC Class 200 SDR 21 2"	\$	<u>3⁰⁰</u>	/LF
Pipe Sleeve: PVC Class 200 SDR 21 4"	\$	<u>5⁰⁰</u>	/LF
Pipe Sleeve: PVC Class 200 SDR 21 6"	\$	<u>8⁰⁰</u>	/LF
Pipe Sleeve: PVC Class 200 SDR 21 8"	\$	<u>10⁰⁰</u>	/LF
Pipe Sleeve: PVC Class 200 SDR 21 10"	\$	<u>14⁰⁰</u>	/LF

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 Employer Mutual Casualty Co, a corporation of the State of Iowa, 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%. 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: _____ Name: _____

Address: _____ Address: _____

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

There are no such persons, firms or corporations

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>CONCRETE WORK</u>	<u>12.59 %</u>	<u>P.A.A. 2054 E. 96th AVE THORNTON 80229</u>
<u>SURFCY</u>	<u>.00685 %</u>	<u>105 WEST INC 4996 E. WAGON TRAIL DR AURORA 80015</u>
<u>GARDNER TURF INSTALL</u>	<u>3.49 %</u>	<u>GARDNER TURF GRASS INC 10850 DOUG ST WESTMINSTER CO 80021</u>
<u>BACKSTOP INSTALL</u>	<u>2.15 %</u>	<u>STEELLOCK FENCE 2690 E 78th AVE DENVER 80229</u>

(Copy this page if additional room is required.)



DENVER
THE MILE HIGH CITY

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

Office of Economic Development
Division of Small Business Opportunity
Compliance Unit
201 West Colfax Avenue, Dept. 907
Denver, CO 80202
Phone: 720-913-1999
Fax: 720-913-1803
DSBO@denvergov.org

City and County of Denver Contract No.: 20110072 LP

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

Prime Bidder

Business Name:

Address:

Contact Person:

Type of Service:

Dollar Amount: \$:

Percent of Project:

SBE Prime Bidder

Business Name: T2 Construction Inc.

Address: 5435 W. 59th Ave Unit H
Arvada CO 80003

Contact Person: Stuart Cameron

Type of Service: Site Development

Dollar Amount: \$: 360,272.32

Percent of Project: 7.9%

Subcontractors, Suppliers Manufacturers or Brokers (check one box)

Subcontractor (✓) Supplier (✓) Manufacturer (✓) Broker (✓)

Business Name: P. A. A.

Address: 2054 E 98th Ave Thornton CO 80229

Type of Service: CONC WORK

Contact Person: SCOTT MCGLOCHLIN

Dollar Amount: \$: 57,453.00

Percent of Project: 12.59

Subcontractor (✓) Supplier (✓) Manufacturer (✓) Broker (✓)

Business Name: STEEL LOCK

Address: 2690 E 78th Ave Denver 80229

Type of Service:

Contact Person: SEAN FARLEY

Dollar Amount: \$: 9873.00

Percent of Project: 2.16

Subcontractor (✓) Supplier (✓) Manufacturer (✓) Broker (✓)

Business Name: 105 WEST INC

Address: 4996 E WATSON TRAIL DR AURORA CO 80015

Type of Service: SURVEYING

Contact Person: RICHARD MUNTEAN

Dollar Amount: \$: 3125.00

Percent of Project: .0068%

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:
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<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:
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<input type="checkbox"/> Subcontractor (√)	<input type="checkbox"/> Supplier (√)	<input type="checkbox"/> Manufacturer (√)	<input type="checkbox"/> Broker (√)
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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 (√)
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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:
-----------------	--------------------	---------------------

List of Proposed SBE rev 011411 JG

The undersigned Bidder hereby certifies that the information provide above regarding its performance on the Project is true and correct and that the undersigned Bidder is a currently certified SBE or qualifying Joint Venture.

Further, 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 SBEs 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 SBE "Letter of Intent" in three (3) working days on a SBE project on each of its SBE 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 based on any failure to comply with the SBE program requirements set forth herein..

The undersigned certifies that it has carefully checked all words 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: 5435 W. 59th Ave Unit H

City, State, Zip Code: Arvada CO 80003

Telephone Number of Bidder: 303-432-8742 Fax No. 303-432-8806

Contact Name for this Project: Stuart Cameron

Social Security or Federal Employer ID Number of Bidder: 84-1353127

Name and location of the last work of this kind herein contemplated upon which the Bidder was engaged:

Compark Village

For information relative thereto, please refer to:

Name: David Bohm - Paul West (project management)

Title: President

Address: 6130 Greenwood Plaza Blvd Ste 110 Greenwood V. 80111

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

Addenda Number 1 Date 5/25/2011

Addenda Number _____ Date _____

Addenda Number _____ Date _____

Dated this 2 day of June, 2011

Signature of Bidder:

If an Individual: _____ doing business

as _____

If a Partnership: _____


by: _____, General Partner.

If a Corporation: T2 Construction Inc.

a Colorado, Corporation,

by: _____, its President.

Attest:

 _____

Secretary

(Corporate Seal)

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

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)

Firm: _____

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

By: _____ (If a Corporation)

Attest:

Title: _____

Secretary (Corporate Seal)



DENVER
THE MILE HIGH CITY

COMMITMENT TO SBE PARTICIPATION

Office of Economic Development
Division of Small Business Opportunity
Compliance Unit
201 West Colfax Avenue, Dept. 907
Denver, CO 80202
Phone: 720-913-1999
Fax: 720-913-1803
DSBO@denvergov.org

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

The Bidder/Proposer is committed to a minimum of 10.8 % SBE 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: With the proposal when due

The Bidder/Proposer is unable to meet the project goal of _____% SBE, but is committed to a minimum of _____% SBE utilization on the project. The Bidder/Proposer understands that they must submit a detailed statement of their good faith effort in accordance with DRMC Section 28-62 and 28-67 of Ordinance 760 and must submit Letters of Intent for each SBE listed in the Bid Forms, within three (3) business days after the bid opening or at time proposal is submitted.

The Bidder/Proposer is a certified SBE 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): T2 Construction Inc.

Firm's Representative (Please print): Stuart Cameron

Signature (Firm's Representative):

Title: President

Address: 5435 W. 59th Ave Unit H

City: Arvada

State: 10

Zip: 80003

Phone: 303-432-8742

Fax: 303-432-8806

Email: Stuart.C@T2-Construction.com

A copy of the SBE Certification must be attached.

Rev 122910 JG

**CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Parks and Recreation**

CONTRACT NO. 201100726

PROJECT NAME: SWANSEA PARK-MASTER PLAN & IRRIGATION IMPROVEMENTS

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:

BID FORM AND SUBMITTAL PACKAGE

None

BID DOCUMENT PACKAGE

None

SPECIFICATIONS / DRAWINGS

See Questions and Answers

QUESTIONS AND ANSWERS

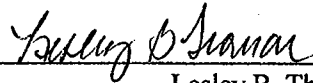
1. The bollard that was specified on the plans, page L-5.1 is 7 years old and the Leda company has since changed ownership to Cal-pipe. The item number specified is not made anymore. The supplier would like to know a wall thickness for the bollard so they can suggest a like bollard using recent model numbers.

CITY RESPONSE: Spec should read 4" round by 48" high Cal-Pipe bollard number IBPO4040-4 inch padlock/removable bollard, 36" up/12" down; with 4" embedment sleeve with stainless steel flip top lid, model #ESRO40P. Powder coat: RAL6012 Federal green, Cap TBD. Available from Calpipe Security Bollards, 12021 Woodruff Ave., #C, Downey, CA 91101, 877.803.9885. (Reference quotation #99435, September 24, 2010)

2. How much/what existing irrigation needs to be removed. The demo plan refers to the irrigation plan for items designated for removal but I don't see anything.
CITY RESPONSE: The existing point of connection is to be protected for use with the new system. The scope is a complete upgrade of the entire system. Existing controller and all other heads, valves, boxes, etc. are to be removed. All components are to be returned to owner.
3. Soil Prep-The plan notes say minimum of 3cy/1000 and the specs say 4cy/1000. Which is correct?
CITY RESPONSE: 4 CY/1000SF.

4. What size are the trees supposed to be for Alternate #7?
CITY RESPONSE: 2" Caliper.
5. The 6' fence shows a 2 7/8" top & bottom rail (no fittings are available & the line posts are 2 3/8").
CITY RESPONSE: The 6' fence should have a 1 5/8" top and bottom rail, not 2 7/8".
6. Footings for the outfield are shown as 24" dia. – the spec calls for 10" dia.
CITY RESPONSE: Concrete footings for the fence posts shall be 18" diameter, not 24".
7. Back stop kickboards are shown as 2 x 12 Trex – only 2 x 6 Trex is available.
CITY RESPONSE: Provide 4 – 2"X6" Trex boards. Color to remain Tan.
8. Kickboard drawing calls for welds to be touched up by electrostatic painting. The spec calls for two coats of Rustoleum.
CITY RESPONSE: Paint per specifications: 2 coats of Rustoleum.
9. Specification calls for galvanized finish on 9ga wire & green powder coat on frame.
CITY RESPONSE: All fencing is to be galvanized only.
10. Windscreen? Where?
CITY RESPONSE: There is no windscreen on this project.

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

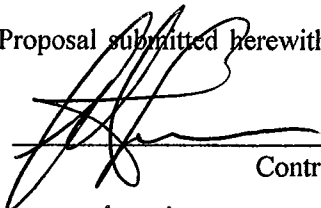


 Lesley B. Thomas
 City Engineer

 5/25/11

 Date

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



 Contractor

ADDENDUM NO. 1

DATE: 6/2/11

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Parks and Recreation
(SBE Defined Pool)

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CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Engineering Division

CONTRACT NO. 201100726
SWANSEA PARK – MASTER PLAN & IRRIGATION IMPROVEMENTS

STATEMENT OF QUANTITIES

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>
01010-1	Mobilization	1 LS
01050-1	Construction Surveying	1 LS
01400-1	Materials Testing	1 LS
01500-1	6' High Portable Chain Link Fence with Gate	1,195 LF
01565-1	Silt Fence	1,000 LF
01565-2	Stabilized Staging Area	1 LS
01565-3	Vehicle Tracking Control	1 LS
01565-4	Concrete Chute Washout	1 LS
02050-1	Remove Concrete Paving	1 LS
02050-2	Remove Asphalt Paving	1 LS
02050-3	Remove Infield Mix and Backstop	1 LS
02050-4	Relocate Players Benches	2 EA
02050-5	Remove Bollards	1 LS
02050-6	Remove Sod	877 SF
02050-7	Remove Guardrail	1 LS
02150-1	Tree Protection Fencing	6,500 LF
02200-1	Earthwork	1 LS
02520-1	Concrete Pavement (6" thick)	17,100 SF
02520-3	Thickened Edge Concrete	85 LF
02520-5	Concrete Curb and Gutter	90 LF
02520-6	Concrete Mow Curb	15 LF
02710-2	Drainage Improvements at New Baseball Field	1 LS
02740-1	Asphaltic concrete Paving	144 SF
02810-1	Removal of Existing Irrigation Equipment	1 LS
02810-2	Irrigation System Installation	1 LS
02810-3	Irrigation System Trench Boring	800 LF
02810-4	Irrigation Antenna Supply	1 LS
02831-1	Backstop Fencing	1 LS
02865-2	Infield Mix Surfacing	10,250 SF
02932-1	Native Seeding	57,500 SF
02932-2	Turfgrass Seeding over Trenches	1 LS
02935-2	Sodding	55,000 SF



CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Engineering Division

CONTRACT NO. 201100726
SWANSEA PARK – MASTER PLAN & IRRIGATION IMPROVEMENTS

STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity
02950-2	Wood Mulch	10,292 SF
02960-2	Installation of Bases and Base Anchors	1 LS
02960-5	Installation of Removalbe Bollards	3 EA
02960-6	Installation of Post And Chain	130 LF
	<u>Bid Alternate – 1 Baseball Outfield Fencing, Mow Curb and Gate</u>	
02831-2	Outfield Fencing and Gate	700 LF
02520-4	12" Concrete Mow Band at Outfiled Fencing	700 LF
	<u>Bid Alternate – 2 Volleyball Concrete Loop Walk</u>	
02520-1	Concrete Pavement (6" thick)	3,933 SF
02050-6	Remove Sod	3,933 SF
	<u>Bid Alternate – 3 Gateway</u>	
05500-1	Inatallation of Gateway	1 LS
	<u>Bid Alternate – 4 Basketball Court</u>	
02520-1	Concrete Pavement (6" thick)	6,240 SF
02960-1	Installation of Basketball Hoops and Court Striping	1 LS
02050-6	Remove Sod	6,240 SF
02810-2	Irrigation System Deduct	-1 LS
	<u>Bid Alternate – 5 Volleyball Courts</u>	
02050-6	Remove Sod	5,982 SF
02520-2	Volleyball Curbwall	225 LF
02520-3	Thickened Edge Concrete	85 LF
02710-1	4" Diameter Perforated PVC SDR-35 Subsurface Drain	70 LF
02710-3	Dry Well at Volleyball	1 LS
02960-3	Volleyball Equipment	1 LS
02865-1	Sand Surfacing	5,900 SF
02810-2	Irrigation System Deduct	-1 LS
	<u>Bid Alternate – 6 Horseshoe Pit</u>	
02050-6	Remove Sod	390 SF
02960-4	Inatallation of Horseshoe Pit	1 LS
02810-2	Irrigation System Deduct	-1 LS
	<u>Bid Alternate – 7 Walk, Sod, Irrigation and Landscape @ New Baseball Field</u>	
02520-1	Concrete Pavement (6" thick)	2,125 SF
02935-2	Sodding	8,700 SF



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

**CONTRACT NO. 201100726
SWANSEA PARK – MASTER PLAN & IRRIGATION IMPROVEMENTS**

STATEMENT OF QUANTITIES

Item No.	Description	Estimated Quantity
02950-1	Trees	18 EA.
02810-2	Irrigation System Installation	1 LS

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Parks and Recreation

NOTICE FOR INVITATION FOR BIDS
FOR CONTRACT NO. 201100726

SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

BID SCHEDULE:
11:00 AM, Local Time
JUNE 02, 2011

Sealed bids will be received at the Office of Economic Development (OED) Reception Desk located on the 2nd floor at 201 West Colfax, Denver, CO 80202, beginning at 10:30 a.m., but no later than 11:00 a.m., on bid day.

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 West Colfax Avenue, Department 614, Denver, Colorado 80202. All properly delivered bids will then be publicly opened and read aloud in Room 1.D.1 on the 1st floor at 201 West Colfax, Denver, Colorado 80202:

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

GENERAL STATEMENT OF WORK:

Demolish existing walks; earthwork, installation of erosion control measures, drainage, concrete flatwork and renovation of irrigation system including replacement of all pipes, rotor and spray heads, valves and irrigation controller. Related work includes installation of a new baseball field, sand volleyball courts, entry gateway, basketball court and horseshoe pit.

ESTIMATED CONSTRUCTION COST:

The estimated cost of construction for this project is between \$488,700.00 and \$597,300.00.

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 #1571859. 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 1:00 PM, local time, on MAY 11, 2011. This meeting will take place at: 201 W. Colfax Ave., Denver, CO, 80202. Conference Room 1D.1 located on the 1st floor.

DEADLINE TO SUBMIT QUESTIONS:May 19, 2011 by 3:00 P.M., local time.

PREQUALIFICATION REQUIREMENTS:

NONE

DEFINED POOL SELECTION REQUIREMENTS:

This construction contract solicitation is subject to the defined pool selection requirements of Article VII, Chapter 28 of the Denver Revised Municipal Code (D.R.M.C.) (the "SBE Ordinance") and, as such, this contract is excluded from the coverage of Article III, Chapter 28 of the D.R.M.C.

Section 28-207, D.R.M.C. of Article VII authorizes the Director of the Division of Small Business Opportunity (DSBO) to designate selected design and construction services contracts as restricted for award only to Small Business Enterprises (SBEs) participating in the defined pool selection program. The Director has designated this project solicitation as a defined pool project, and in accordance with the SBE ordinance, award will be strictly limited to currently certified SBE bidders/joint venturers who comply with the requirements of Article VII. Proper SBE certification in accordance Section 28-206, D.R.M.C. shall be a condition of responsiveness and award will only be made to the lowest, total, responsive, qualified **SBE bidder**. Under Section 28-208, D.R.M.C., compliance with this defined pool selection requirement shall be mandatory for all bidders and shall require a demonstration that each bidder is either: (1) a certified SBE contractor or (2) a qualified joint venture that includes a certified SBE contractor. In addition, each bidder must establish that such SBE will perform a commercially useful function. Section 28-209, D.R.M.C. direct the Director of the Division of Small Business Opportunity to establish a mandatory SBE sub contractor participation requirement for selected projects. The mandatory SBE participation requirement for this project is:

10.00% Small Business Enterprise (SBE) Participation

This mandatory subcontractor participation requirement is in addition to the defined pool prime contractor selection requirement described above and, as such, must be met only with certified subcontractors, suppliers and other participants as set forth in Sections 28-209 and 28-210, D.R.M.C. A bidder cannot meet this additional participation requirement through self performance.

Each bidder shall submit, at the time of bid opening, the completed forms and other information required by DSBO to demonstrate compliance with the requirements of Article VII under § 28-212, D.R.M.C. A determination by DSBO that a bidder has failed to comply with these defined pool selection requirements, as specified herein and set forth in Chapter VII, and as such, is non-responsive shall result in no further consideration of the bid by the Manager of Public Works.

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 Manager of Public Works, the City and County of Denver, reserves the right to reject any or all bids and to waive informalities in bids.

Publication Dates: May 4, 5, 6, 2011

Published In: The Daily Journal

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Parks and Recreation

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 bound 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 printed and distributed in hard copy 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 printed and distributed in hard copy 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, interlineation, 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 proper bid guarantee, satisfying all of the requirements specified herein and on the form provided herein shall render the bid nonresponsive and may 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 bound sets of 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 sufficient copies of the Contract Documents by incorporating all of the documents submitted by the Apparent Low Bidder into executable copies of the Contract Documents made available pursuant to the Notice of Invitation for Bids. These copies will then be made available to the Apparent Low Bidder who shall thereafter properly sign all of the copies. At this time, the successful bidder shall also provide certain supplemental documents for incorporation into the Contract Documents. These supplemental documents shall include: 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 materials 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 Administrator. 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 WAGE RATE REQUIREMENTS

In preparing any bid hereunder, the Contractor must comply with and should carefully consider all requirements and conditions of the City's Payment of Prevailing Wages Ordinance, Division 3 of Article IV D.R.M.C. and any determinations made by the City pursuant thereto.

At the time of the preparation of the Contract Documents, the then-current prevailing wage rates applicable to this Project shall be bound within the Contract Documents made available to potential bidders for the Project. If, more than ten (10) days prior to the actual date of bid opening, the Career Service Board determines that prevailing wages rates different from those bound in the Contract Documents are applicable to one or more of the various classes of laborers, mechanics and workers encompassed by this Project, such different prevailing wage rates shall be provided in an addendum. If different prevailing wage rates are determined by the Career Service Board ten (10) or less days prior to the actual date of bid opening, the City will determine on a case by case basis in its sole discretion whether such different prevailing wage rates are to be included in an addendum. In conjunction with such determination, the City may elect, in its

sole discretion, to postpone the date of bid opening on the Project. In any event, the bidder will be held, at the actual date of bid opening, to those prevailing wage rates incorporated into the Contract Documents and as modified by any such addenda.

These prevailing wage rates shall be the **minimum** wage rates to be paid by all contractors or subcontractors for a period not to exceed one (1) year from the date of the Contract. Increases in prevailing wages subsequent to the date of the Contract for a period not to exceed one (1) year shall not be mandatory on either the contractor or subcontractors. Future increases in prevailing wages on contracts whose period of performance exceeds one (1) year shall be mandatory for the contractor and subcontractors only on the yearly anniversary date of the Contract. The **minimum** City prevailing wage rate for any such subsequent yearly period or portion thereof shall be the wage rates in effect on the yearly anniversary date of the contract which begins such subsequent period. In no event shall any increases in prevailing wages over the amounts thereof as stated in such Technical Specifications and addenda thereto result in any increased liability on the part of the City and the possibility and risk of any such increase is assumed by all contractors entering into any such contract with the City. Decreases in prevailing wages subsequent to the date of the contract for a period not to exceed one year (1) shall not be permitted. Decreases in prevailing wages on contracts whose period of performance exceeds one (1) year shall not be effective except on the yearly anniversary date of the contract.

IB-23 TAX REQUIREMENTS

General. Bidders are referred to the General Contract Condition 322, 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 is subject to such tax.

IB-24 DISCLOSURE OF PRINCIPALS

Pursuant to D.R.M.C. 20-69, any bid in excess of \$100,000.00 must be accompanied by a separate detachable page setting forth the following information:

(1) The name of any officer, director, owner or principal of the business entity, including identity of any shareholder who owns or controls 5% or more of the business entity, and either 1) the names of his or her spouse, and children under eighteen years of age; or 2) a statement that he or she or his or her spouse, or children, if any, under the age of eighteen have or have not made a contribution, as defined in D.R.M.C. 15-32, or contribution in kind, as defined in D.R.M.C. 15-32, to any candidate, as defined in D.R.M.C. 15-32, during the last five years and identifying by name himself or herself or any spouse or child under the age of eighteen who has made such a contribution or contribution in-kind to a candidate.

(2) The names of any subcontractors or suppliers whose share of the bid exceeds \$100,000.00 of the contract or formal bid amount.

(3) The names of any unions with which the bidder has a collective bargaining agreement.

If the total bid amount is in excess of \$500,000.00, the information required in (1) above must be provided at the time of bid submittal, and the information required in (2) and (3) must be submitted in a timely fashion prior to award. The list of subcontractors required by this instrument is different and separate from the bidding list required on BF-4.

If the total bid amount is less than \$500,000.00 but more than \$100,000.00, such information must be provided prior to award of the contract. Failure to provide the required information in a timely fashion shall render any bid to which D.R.M.C. 20-69 applies non-responsive.

While a bidder or supplier who has already disclosed such information need not provide such information with a second or subsequent bid or proposal unless such information has changed, it shall be the responsibility of each such bidder or proposer to verify that such information is still current as of the date of such subsequent bid or proposal and is in fact on file with the City Clerk.

A form, which may be used for such disclosure, is contained in the Special Conditions Section of the Contract Documents. The form is entitled: Bidder/Contractor/Vendor/Proposer Disclosure. Failure to provide or update the required information in a timely fashion shall render any bid to which D.R.M.C. 20-69 applies non-responsive.

IB-25 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-26 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 DenverGov.com for information, both general and project specific. The Contract Administrator assigned to this project is Toni Green who can be reached via email at toni.green@denvergov.org

IB-27 DEFINED POOL SMALL BUSINESS ENTERPRISE (SBE) REQUIREMENTS

Article VII of Chapter 28 of the Revised Municipal Code (Section 28-201 et seq., D.R.M.C.) (the "SBE Ordinance or Ordinance") applies to this Project and is incorporated into this Contract by reference and this contract is excluded from the coverage of Article III, Chapter 28 of the D.R.M.C. As such, each bidder must comply with the terms and conditions of the Ordinance in making its bid and, if awarded the Contract, in performing all Work thereunder. A bidder's failure to comply with the Ordinance, any Rules or Regulations promulgated pursuant thereto, or any additional requirements contained herein shall render the bid non-responsive and shall constitute cause for rejection. Failure by the contractor awarded the contract to comply with Ordinance requirements during the performance of the contract is a material breach of the contract, and may result in the termination of this contract, sanctions or such other remedy, as deemed appropriate by DSBO. Copies of the Ordinance and its accompanying Rules and Regulations are available for the use and review of bidders from DSBO.

Section 28-207, D.R.M.C. of Article VII authorizes the Director of the Division of Small Business Opportunity (DSBO) to designate selected design and construction services contracts as restricted for award only to Small Business Enterprises (SBEs) participating in the defined pool selection program. The

Director has designated this project solicitation as a defined pool project and, in accordance with the SBE ordinance, award will be strictly limited to currently certified SBE bidders/joint venturers who comply with the requirements of Article VII. Proper SBE certification in accordance Section 28-206, D.R.M.C. shall be a condition of responsiveness and award will only be made to the lowest, total, responsive, qualified **SBE bidder**. Under Section 28-208, D.R.M.C., compliance with this defined pool selection requirement shall be mandatory for all bidders and shall require a demonstration that each bidder is either: (1) a certified SBE contractor or (2) a qualified joint venture that includes a certified SBE contractor. In addition, each bidder must establish that such SBE will perform a commercially useful function. Each bidder shall submit, at the time of bid opening, the completed forms and other information required by DSBO to demonstrate compliance with the requirements of this Article VII. A determination by DSBO that a bidder has failed to comply with this defined pool selection requirement, as specified herein and set forth in Chapter VII, and, as such, is non-responsive; shall result in no further consideration of the bid by the Manager of Public Works.

In addition, Section 28-209, D.R.M.C. directs the Director of the Division of Small Business Opportunity to establish a mandatory SBE subcontractor participation requirement for selected projects. The mandatory SBE participation requirement for this Project is:

10.00% Small Business Enterprise (SBE) Participation

This mandatory subcontractor participation requirement is in addition to the defined pool prime contractor selection requirement described above and, as such, must be met only with certified subcontractor, supplier and other participants as set forth in Sections 28-209 and 28-210, D.R.M.C. A bidder cannot meet this additional participation requirement through self performance.

In preparing a bid to meet the mandatory SBE participation requirement of the Ordinance, the bidder should carefully consider the following instructions relating to compliance with the Ordinance:

1. In preparing its bid, each bidder shall list on the Bid Form pages entitled "List of Proposed Small Business Enterprise Subcontractors, Suppliers, Manufacturers, Manufacturers' Representatives or Brokers" the name, address, work description/supply, committed level of participation and other required information for each SBE of any tier which the bidder intends to use in performing the work on this Project. **Only the SBE Subcontractors, Suppliers, Manufacturers, Manufacturers' Representatives or Brokers 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 mandatory participation requirement. Additional, revised or corrected participation submitted after bid opening will not be considered. SBE bidders may NOT count self-performance or joint venture activity in meeting the mandatory participation requirement for the project. SBE bidders may count joint venture activity in meeting the mandatory participation requirement for the project, but only for the scope of work performed as a commercially useful function and at a percentage level the SBE participant will be performing itself.**
2. All SBE Subcontractors, Suppliers, Manufacturers, Manufacturers' Representatives or Brokers 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 requirement. DSBO maintains an SBE Directory ("Directory"), which is a current listing of SBE's that have been certified by the City. A copy of the Directory is located at DSBO's web site at www.milehigh.combusiness/do-business. Bidders are encouraged to use the Directory to assist in locating SBEs 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 SBE program and a current copy of the Directory must always be used in preparing a bid. SBE certification or listing in the Directory is not a representation or warranty by the City as to the qualifications of any listed SBE.
3. In accordance with the provisions of the Ordinance, DSBO will evaluate each bid to determine the responsiveness of the bid to the requirements of the Ordinance. In determining whether a bidder's committed level of participation meets or exceeds the stated SBE requirement, 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 SBE percentage established for the project to determine the exact dollar amount of required SBE participation for the Project. This amount will then be compared against the exact dollar amounts for the SBEs committed for participation by the bidder. If the total dollar amount of participation listed meets or exceeds the established SBE dollar amount requirement listed, then DSBO will determine that the goal has been met.
- b. In addition, DSBO will determine the exact commitment percentage for each listed SBE by dividing the dollar amount listed for each SBE by the total base bid dollar amount submitted by the bidder. These individual percentages, when totaled for all listed SBEs, will establish the total committed percentage level of SBE participation that the bidder must comply with during the life of the contract. In all cases, the committed percentage level of SBE participation must equal or exceed the assigned SBE goal for the Project.
- c. In providing the exact dollar amount of participation for each listed SBE, 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 mandatory requirement 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 SBE mandatory participation requirement.
- d. As previously mentioned, compliance with the SBE mandatory participation requirement 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 SBE mandatory participation requirement. However, should any designated alternate be selected by the City for inclusion in the contract ultimately awarded, the SBE requirement 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 SBE mandatory participation requirement 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 SBE 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 SBE suppliers shall count toward satisfaction of the SBE mandatory participation requirement. On Projects under Five Million (\$5,000,000.00) the value of the commercially useful function of SBE 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. **To utilize the SBE 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 SBE mandatory participation requirement. 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 requirement.

4. On or before the third (3rd) working day after bid opening, all of the Bidders are required to submit an executed "SBE Letter of Intent" for each SBE listed on the Bid Form as a subcontractor, supplier, manufacturer, manufacturers' representative or broker of any tier. An SBE bidder is not required to submit a Letter of Intent on themselves. Each Letter of Intent shall be submitted only for the SBEs listed at the time of bid opening, since this is the only participation that will be counted toward satisfaction of the SBE mandatory participation requirement. A form for the SBE Letter of Intent is included with the Bid Form. The SBE 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 SBE or that its subcontractor(s) and supplier(s), manufacturer(s), manufacturers' representative(s) and broker(s) will do so. Each SBE Letter of Intent shall be accompanied by a copy of the City and County of Denver's SBE certification letter for each proposed SBE 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.

In accordance with the provisions of the Ordinance, the bidder agrees that it is committed to meeting the SBE mandatory participation requirement. This commitment must be expressly indicated on the "Commitment to Small Business Enterprise Participation" form included with the Bid Form. This commitment includes acceptance of the following understandings:

1. The bidder understands it must maintain the committed SBE mandatory participation level throughout the performance of the Contract as required by D.R.M.C. 28-222.
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 committed SBE mandatory participation level.
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 28-223 of the 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 SBE 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 SBEs equal to the original SBE mandatory participation commitment. The contractor shall satisfy such SBE mandatory participation requirement with respect to such changed scope of work by soliciting new SBEs in accordance with Section 28-206 of the Ordinance, as applicable, or the contractor must show each element of modified good faith set out in Section 28-221(c) of the Ordinance. The contractor shall supply to the Director the documentation described in Section 28-221(c) of the Ordinance with respect to the increased dollar value of the contract.

Section 29-212, D.R.M.C. requires each bidder to list, at the time of bid opening, the SBE prime contractor all subcontractors that meet the mandatory defined pool requirements for the bid. The bidder shall fully complete and execute the following forms to address the defined pool program requirements for this solicitation:

1. SBE Participation List
2. SBE Commitment Page
3. SBE Letters of Intent (to be submitted 3 days after bid)

In addition, if the bidder intends to address the defined pool program requirements for this solicitation through the use of a Joint Venture, the bidder shall fully complete and execute the following additional forms:

1. Joint Venture Eligibility Form
2. Joint Venture Affidavit Form

DSBO will evaluate only the completed and fully executed forms provided with the bid or as otherwise specified and determine whether or not the bid is responsive under Section 28-213, D.R.M.C. If a bidder has failed to comply with the defined pool selection requirement process outlined in this section and the referenced forms, a bid may be found non-responsive and shall result in no further consideration of the bid by the Manager of Public Works.

All bidders are charged with knowledge of and are solely responsible for complying with each and every provision of the 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 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 Ordinance or contact the Project's designated DSBO representative at (720) 913-1700.

**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
Parks and Recreation

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
Parks and Recreation

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/ _____

Manager 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 Office of Contract Compliance. 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
Parks and Recreation**

CONTRACT NO. 201100726

SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

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

**T2 Construction, Inc.,
5435 W. 59th Ave., Unit H
Arvada, CO 80003**

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

WITNESSETH, Commencing on **May 4, 2011**, 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:

CONTRACT NO. 201100726
**SWANSEA PARK - MASTER PLAN & IRRIGATION
IMPROVEMENTS**

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
SBE Commitment Form and List of Participants
Article VII, 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 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 **100 (One Hundred 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 01010-1 through 02960-6 (36 base bid items), plus Add Alternates One through Seven (24 items)**, the total estimated cost thereof being **Six Hundred Two Thousand One Hundred Forty Dollars and Ten Cents (\$602,140.10)**. 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. DEFINED POOL SELECTION REQUIREMENTS:

This construction contract is subject to the defined pool program requirements of Article VII, Chapter 28 of the Denver Revised Municipal Code (D.R.M.C.) (the "SBE Ordinance") and, as such, this contract is excluded from the coverage of Article III, Chapter 28 of the D.R.M.C. Section 28-222, D.R.M.C. of Article VII requires that all Contractors participating in the defined pool solicitation program comply with all Small Business Enterprise (SBE) utilization commitments upon which an award was made.

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 Small 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.

REMAINDER OF PAGE LEFT INTENTIONALLY BLANK

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: 201100726

Vendor Name: T2 Construction, Inc.

By: 

Name: STUART CAMERON
(please print)

Title: PRESIDENT
(please print)

ATTEST: [if required]

By: 

Name: Beth Dalebroux
(please print)

Title: Office Manager
(please print)

Contract Control Number:

Vendor Name:

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 _____



**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
Parks and Recreation

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,
(The Index for which is bound herein and commonly referred to as the "Orange Book")
(1999 Edition)

Transportation Standards and Details for the Engineering Division

City and County of Denver Traffic Standard Drawings

Wastewater Management Division

– *Standard Detail Drawings*

– *Storm Drainage and Sanitary Sewer Construction Detail and Technical 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 2006 Series, City and County of Denver Amendments 2006)

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 for purchase at the Cashier, 2nd floor at 201 W. Colfax Ave., Denver, Colorado 80202. *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 CONSTRUCTION DOCUMENTS

The construction documents consist of Plans, Technical Specifications and, if applicable, Drawings as identified in the Index for Contract Drawings, the Index for Technical Specifications and any additional Plans attached hereto.

SC-3 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-4 ENGINEERING DIVISION / CITY ENGINEER

General Condition 206, TRANSPORTATION DIVISION, is hereby deleted in its entirety and replaced with the following:

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-5 WASTEWATER MANAGEMENT DIVISION

General Condition Section 208, WASTEWATER MANAGEMENT DIVISION , is hereby deleted in its entirety and replaced with the following:

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-6 CITY DELEGATION OF AUTHORITY

With reference to General Contract Condition 109, DEPUTY MANAGER, General Contract Condition 206, ENGINEERING DIVISION and General Contract Condition 214, 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:

Project Manager
City Project Manager
Ruth Murayama

Telephone

(720) 913-0613

Consultant
Design Consultant
Design Concepts

Name
Consultant Contact
Carol Henry

Telephone

(303) 664-5301

SC-7 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-8 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-9 PAYMENTS TO CONTRACTORS

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/Engineering Division	Kim Blair	(720) 865-3141

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. 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.

In accordance with General Contract condition 907, RELEASES AND CONTRACTORS CERTIFICATION OF PAYMENT, Applications for Payment must be accompanied by completed Partial or Final Claim Release Form, as appropriate, from EACH subcontractor and supplier, OR the Contractors' Certification of Payment Form. The forms, Final/Partial Release and Certificate of Payment (Subcontractor/Supplier) and the Contractor's Certification of Payment, either of which must be used are as follows:

DEPARTMENT OF PUBLIC WORKS
Parks and Recreation

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

(CITY PROJECT NAME AND NUMBER)

(NAME OF CONTRACTOR)

(NAME OF SUBCONTRACTOR/SUPPLIER)

Date: _____, 20____.

Subcontract #: _____.

Subcontract Value: \$ _____.

Last Progress Payment: \$ _____.

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: _____



DENVER
THE MILE HIGH CITY

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
Fax: 720-913-1803
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.

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/DBEs use the exact name listed in the DSBO Directory.

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

COMP-REF-031

Rev 032211 JG

SC-10 RESERVED

SC-11 GENERAL CONTRACT CONDITION REVISION

General Contract Condition 210 is hereby deleted in its entirety.

SC-12 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)

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-13 CONSTRUCTION INSPECTION BY THE CITY

General Condition 1702, AUTHORITY OF INSPECTORS, is modified as follows:

1702.1 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 The Building Inspection Division 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-14 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-15 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-16 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-17 DEBARRED SUBCONTRACTORS PROHIBITED

The Contractor is prohibited from hiring any subcontractor currently debarred by the City in accordance with section 20-77 of the Denver Revised Municipal Code.

SC-18 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-19 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 stating "Should any of the above-described policies be canceled or non-renewed before the expiration date thereof, the issuing company shall send written notice to Denver Risk Management, 201 West Colfax Avenue, Dept. 1105, Denver, Colorado 80202. Such written 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." Additionally, Contractor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the address above by certified mail, return receipt requested. 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, 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 policy 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, separation of insureds or cross liability provision; 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-20 DEFENSE AND INDEMNIFICATION

General Condition 1602, INDEMNIFICATION, is modified to read in full as follows:

DEFENSE AND INDEMNIFICATION

- (a) To the fullest extent permitted by law, the Contractor hereby agrees to defend, indemnify, and hold harmless City, its appointed and elected officials, agents and employees against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or related to the work performed under this Contract that are due to the negligence or fault of the Contractor or the Contractor's agents, representatives, subcontractors, or suppliers ("Claims"). This indemnity shall be interpreted in the broadest possible manner consistent with the applicable law to indemnify the City.
- (b) Contractor's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether suit has been filed and even if Contractor is not named as a Defendant.
- (c) Contractor will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this

- (b) Contractor's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether suit has been filed and even if Contractor is not named as a Defendant.
- (c) Contractor will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City shall be in addition to any other legal remedies available to City and shall not be considered City's exclusive remedy.
- (d) Insurance coverage requirements specified in this Contract shall in no way lessen or limit the liability of the Contractor under the terms of this indemnification obligation. The Contractor shall obtain, at its own expense, any additional insurance that it deems necessary for the City's protection.
- (e) This defense and indemnification obligation shall survive the expiration or termination of this Contract.

SC-21 GREENPRINT DENVER REQUIREMENTS

In accordance with the City and County of Denver Executive Order 123: Greenprint Denver Office and Sustainability Policy (dated October 27, 2007), and the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, Contractor shall, wherever possible, recycle construction and demolition waste, and install building materials that contain recycled content. Non-hazardous solid waste that is eligible for reuse or recycling is not subject to the DADS disposal requirement defined in SC-14. The Contractor shall recycle and/or reuse construction and demolition waste and implement sustainable development practices on construction projects in compliance with any Project Requirements of the Better Denver Program Sustainability Form that are included in the Contract Documents.

At the Project Pre-Construction Meeting, the Contractor shall provide a written summary of how the Contractor intends to meet any applicable Project Requirement, and the type of documentation to be provided. The Contractor shall maintain and keep current documentation of the materials recycled or reused, organized in accordance with any applicable Closeout Form for Contractors provided in the Contract Documents for the duration of the Project. A copy of the completed Closeout Form, the quantity tabulation, and all supporting documentation for materials reused or recycled shall be delivered to the Project Manager as a submittal requirement of Final Acceptance.

SC-22 CITY AUDITOR AND MANAGER OF FINANCE

Section 211, City Auditor, of the General Contract Conditions, 1999 Edition, is amended to read in its entirety as follows:

211 CITY AUDITOR AND MANAGER OF FINANCE

The City Auditor, an independent elected official, reviews certified payrolls for compliance with prevailing wage requirements before payment is made to a Contractor. The City's Manager of Finance pays the Contractor for Work approved under the Contract.

SC-23 NO EMPLOYMENT OF ILLEGAL ALIENS TO PERFORM WORK UNDER THE AGREEMENT:

- a. This Agreement is subject to Division 5 of Article IV of Chapter 20 of the Denver Revised Municipal Code, and any amendments (the "Certification Ordinance").
- b. The Contractor certifies that:
 - 1. At the time of its execution of this Agreement, it does not knowingly employ or contract with an illegal alien who will perform work under this Agreement.
 - 2. It will participate in the E-Verify Program, as defined in § 8-17.5-101(3.7), C.R.S., to confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement.
- c. The Contractor also agrees and represents that:
 - 1. It shall not knowingly employ or contract with an illegal alien to perform work under the Agreement.
 - 2. It shall not enter into a contract with a subconsultant or subcontractor that fails to certify to the Contractor that it shall not knowingly employ or contract with an illegal alien to perform work under the Agreement.

3. It has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement, through participation in the E-Verify Program.
4. It is prohibited from using the E-Verify Program procedures to undertake pre-employment screening of job applicants while performing its obligations under the Agreement, and that otherwise requires the Contractor to comply with any and all federal requirements related to use of the E-Verify Program including, by way of example, all program requirements related to employee notification and preservation of employee rights.
5. If it obtains actual knowledge that a subconsultant or subcontractor performing work under the Agreement knowingly employs or contracts with an illegal alien, it will notify such subconsultant or subcontractor and the City within three (3) days. The Contractor will also then terminate such subconsultant or subcontractor if within three (3) days after such notice the subconsultant or subcontractor does not stop employing or contracting with the illegal alien, unless during such three-day period the subconsultant or subcontractor provides information to establish that the subconsultant or subcontractor has not knowingly employed or contracted with an illegal alien.
6. It will comply with any reasonable request made in the course of an investigation by the Colorado Department of Labor and Employment under authority of § 8-17.5-102(5), C.R.S, or the City Auditor, under authority of D.R.M.C. 20-90.3.

d. The Contractor is liable for any violations as provided in the Certification Ordinance. If Contractor violates any provision of this section or the Certification Ordinance, the City may terminate this Agreement for a breach of the Agreement. If the Agreement is so terminated, the Contractor shall be liable for actual and consequential damages to the City. Any such termination of a contract due to a violation of this section or the Certification Ordinance may also, at the discretion of the City, constitute grounds for disqualifying Contractor from submitting bids or proposals for future contracts with the City.

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

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned T2 Construction, Inc., 5435 W. 59th Ave., Unit H, Arvada, CO, 80003, a corporation organized and existing under and by virtue of the laws of the State of COLORADO, hereafter referred to as the "Contractor", and Employers Mutual Casualty Company, a corporation organized and existing under and by virtue of the laws of the State of IOWA, 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 Six Hundred Two Thousand One Hundred Forty Dollars and Ten Cents (\$602,140.10), 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. 201100726 SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS, 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 3 day of June, 2011.

Attest:

Secretary

[Handwritten Signature]

T2 Construction, Inc.

Contractor

By:

[Handwritten Signature] Pres

Employers Mutual Casualty Company

Surety

By:

[Handwritten Signature]
Attorney In-Fact Tiffany McGonigle

(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:

Assistant City Attorney

APPROVED FOR THE CITY AND COUNTY OF DENVER

By:

MAYOR

By:

MANAGER OF PUBLIC WORKS

EMC Insurance Companies® No. 958955

P.O. Box 712 • Des Moines, IA 50306-0712

CERTIFICATE OF AUTHORITY INDIVIDUAL ATTORNEY-IN-FACT

NOW ALL MEN BY THESE PRESENTS, that:

Employers Mutual Casualty Company, an Iowa Corporation
EMCASCO Insurance Company, an Iowa Corporation
Union Insurance Company of Providence, an Iowa Corporation
Illinois EMCASCO Insurance Company, an Iowa Corporation

5. Dakota Fire Insurance Company, a North Dakota Corporation
6. EMC Property & Casualty Company, an Iowa Corporation
7. Hamilton Mutual Insurance Company, an Iowa Corporation

hereinafter referred to severally as "Company" and collectively as "Companies", each does, by these presents, make, constitute and appoint:

KEVIN W. MCMAHON, ANNE E. HILL, TIFFANY MCGONIGLE, DONALD E. APPLEBY, FLORIETTA ACOSTA, DILYNN GUERN, SUSAN J. LATTARULO, J.R. RICHARDS, MARK SWEIGART, SARAH BROWN, INDIVIDUALLY, DENVER, COLORADO.....

true and lawful attorney-in-fact, with full power and authority conferred to sign, seal, and execute its lawful bonds, undertakings, and other obligatory instruments of a similar nature as follows:

ANY AND ALL BONDS

to bind each Company thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of each such Company, and all of the acts of said attorney pursuant to the authority hereby given are hereby ratified and confirmed.

authority hereby granted shall expire APRIL 1, 2012 unless sooner revoked.

AUTHORITY FOR POWER OF ATTORNEY

Power-of-Attorney is made and executed pursuant to and by the authority of the following resolution of the Boards of Directors of each of the Companies at a regularly scheduled meeting of each company duly called and held in 1999:

RESOLVED: The President and Chief Executive Officer, any Vice President, the Treasurer and the Secretary of Employers Mutual Casualty Company shall have power and authority to (1) appoint attorneys-in-fact and authorize them to execute on behalf of each Company and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and (2) to remove any such attorney-in-fact at any time and revoke the power and authority given to him or her. Attorneys-in-fact shall have power and authority, subject to the terms and limitations of the power-of-attorney issued to them, to execute and deliver on behalf of the Company, and to attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and any such instrument executed by any such attorney-in-fact shall be fully and in all respects binding upon the Company. The validity of any power-of-attorney authorized herein made by an officer of Employers Mutual Casualty Company shall be fully and in all respects binding upon this Company. The facsimile or mechanically reproduced signature of such officer, whether made heretofore or hereafter, wherever appearing upon a copy of any power-of-attorney of the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

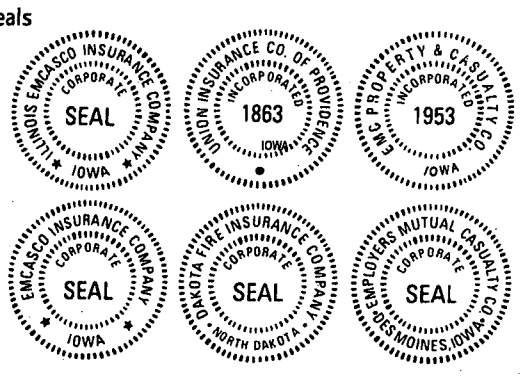
IN WITNESS WHEREOF, the Companies have caused these presents to be signed for each by their officers as shown, and the Corporate seals to be hereto affixed this 29TH day of JULY, 2010.

Bruce G. Kelley

Bruce G. Kelley, Chairman
of Companies 2, 3, 4, 5 & 6; President
of Company 1; Vice Chairman and
CEO of Company 7

Michael Freel

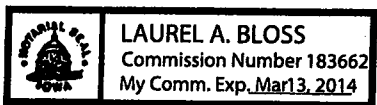
Michael Freel
Assistant Secretary



On this 29TH day of JULY AD 2010 before me a Notary Public in and for the State of Iowa, personally appeared Bruce G. Kelley and Michael Freel, who, being by me duly sworn, did say that they are, and are known to me to be the Chairman, President, Vice Chairman and CEO, and/or Assistant Secretary, respectively, of each of The Companies above; that the seals affixed to this instrument are the seals of said corporations; that said instrument was signed and sealed on behalf of each of the Companies by authority of their respective Boards of Directors; and that the said Bruce G. Kelley and Michael Freel, as such officers, acknowledge the execution of said instrument to be the voluntary act and deed of each of the Companies.
My Commission Expires March 13, 2014.

Laurel A. Bloss

Notary Public in and for the State of Iowa



CERTIFICATE

James D. Clough, Vice President of the Companies, do hereby certify that the foregoing resolution of the Boards of Directors by each of the Companies, and the Power of Attorney issued pursuant thereto on JULY 29, 2010 by Kevin W. McMahon, Anne E. Hill, Tiffany McGonigle, Donald E. Appleby, Florietta Acosta, Dilynn Guern, Susan J. Lattarulo, and correct and are still in full force and effect. J.R. Richards, Mark Sweigart, Sarah Brown
In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this _____ day of _____.

J. D. Clough

Vice-President



Main Office: (303) 722 7776
Fax: (303) 722 8862
Toll Free: (800) 332 9950
Website: www.willis.com

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

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

RE: T2 Construction, Inc.
Contract No. 201100726, Swansea Park - Master Plan & Irrigation Improvements
Amount: \$602,140.10
Performance and Payment Bond No.: S397618

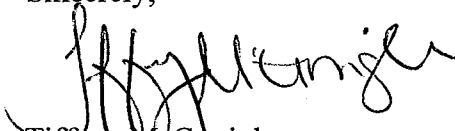
The Performance and Payment Bonds covering the above captioned project were executed by this agency through **Employers Mutual Casualty Company** on June 27, 2011.

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.

Thank you.

Sincerely,



Tiffany McGonigle,
Attorney-In-Fact

CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis of Colorado, Inc. 720 South Colorado Boulevard Suite 600N Denver, CO 80246	CONTACT NAME: Yolanda Salaiz PHONE (A/C, No, Ext): 303-765-1542 E-MAIL ADDRESS: yolanda.salaiz@willis.com	FAX (A/C, No): 303-698-7564
	INSURER(S) AFFORDING COVERAGE	
INSURED T2 Construction, Inc. 5435 W 59th Ave. Unit H Arvada, CO 80003	INSURER A: Mountain States Insurance Group NAIC # 5900	
	INSURER B: Pinnacol Assurance 41190	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> PD Ded:250 UND247 (02/08) GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC		X	CPP009658208	11/01/2010	11/01/2011	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$100,000 MED EXP (Any one person) \$10,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$2,000,000 \$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> Drive Oth Car <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			BAP009658208	11/01/2010	11/01/2011	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION \$			UMB009658209	11/01/2010	11/01/2011	EACH OCCURRENCE \$2,000,000 AGGREGATE \$2,000,000 \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		Y/N Y N/A	3490327	10/01/2010	10/01/2011	<input checked="" type="checkbox"/> WC STATUTORY LIMITS OTHER E.L. EACH ACCIDENT \$500,000 E.L. DISEASE - EA EMPLOYEE \$500,000 E.L. DISEASE - POLICY LIMIT \$500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
Project Description: Swansea Park-Master Plan & Irrigation Improvements Contract No 201100726
 The City and County of Denver, its elected and appointed officials, employees and volunteers are named as additional insured with regards to the commercial general liability policy and the business auto Liability policy.

CERTIFICATE HOLDER City and County of Denver Dept of Public Works 201 West Colfax, Dept 611 Denver, CO 80202	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Constance J. Rivera</i>
---	--



DENVER
THE MILE HIGH CITY

Department of Public Works
Engineering Department

201 W. Colfax Avenue
Denver, CO 80202
www.denvergov.org/PublicWorks

**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: 201100726
Project Name: SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS
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
THE MILE HIGH CITY

Department of Public Works
Engineering Department

201 W. Colfax Avenue
Denver, CO 80202
www.denvergov.org/PublicWorks

NOTICE OF APPARENT LOW BIDDER
(SAMPLE)

Current Date

To:

Gentlemen:

The MANAGER OF PUBLIC WORKS has considered the Bids submitted on June 02, 2011 for work to be done and materials to be furnished in and for:

PROJECT No. 201100726 SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

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, Engineering Division, Project Management Office, 201 W. Colfax Ave, Denver, Colorado 80202, to receive the said Contract Documents, execute the same and return them to the Department of Public Works, Finance and Administration Division, 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 ACORD Certificates: Commercial General Liability and Automotive Liability, Workman's Compensation and Employer Liability, Builder's Risk/Installation Floater, as set forth in the Contract;
- 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).



Contract No. 201100726
Swansea Irrigation

BDP - 49

May 4, 2011

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

PROJECT NO. 201100726

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

Manager of Public Works



Department of Public Works
Engineering Department
201 W. Colfax Avenue
Denver, CO 80202
www.denvergov.org/PublicWorks

Current Date

**NOTICE TO PROCEED
(SAMPLE)**

Name
Company
Street
City/State/Zip

**CONTRACT NO. 201100726, SWANSEA PARK - MASTER PLAN & IRRIGATION
IMPROVEMENTS**

In accordance with General Contract Condition 302 of the Standard Specifications for Construction, General Contract Conditions, 1999 Edition, you are hereby authorized and directed to proceed on _____ with the work of constructing contract number 201100726, 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 322.5, 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
THE MILE HIGH CITY

Department of Public Works
Engineering Department

201 W. Colfax Avenue
Denver, CO 80202
www.denvergov.org/PublicWorks

Certificate of Contract Release
(SAMPLE)

Date

Name

Company

Street

City/State/Zip

RE: Certificate of Contract Release for

201100726, SWANSEA PARK - MASTER PLAN & IRRIGATION IMPROVEMENTS

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.

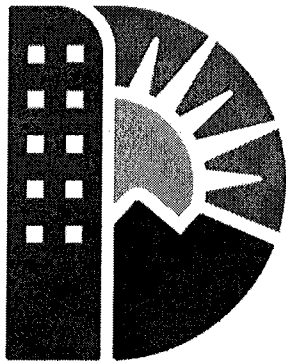
Signature Contractor's
Date Signed

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.



CITY AND COUNTY OF DENVER

STATE OF COLORADO



DENVER[®]
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS/ PARKS AND RECREATION DIVISION

PREVAILING WAGE RATES

Contract No. 201100726

**SWANSEA PARK - MASTER PLAN & IRRIGATION
IMPROVEMENTS**

May 4, 2011



DENVER
THE MILE HIGH CITY

Career Service Authority
Denver's Human Resource Agency

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

TO: All Users of the City of Denver Prevailing Wage Schedules
FROM: Meredith Creme, Staff Human Resource Professional
DATE: Friday December 10, 2010
SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, to fill in for missing rates from subsequent Heavy and Highway wage schedules, the Career Service Authority Board in their meeting held on November 3, 2005, approved to use the last comprehensive prevailing wage schedule for Heavy and Highway projects published on March 1, 2002. The missing rates will be provided as supplemental to the Davis Bacon Heavy and Highway rates issued by CSA.

With regards to the Building rates, the last comprehensive prevailing wage schedule for Building projects published, on November 9, 2001, will continue to be used to fill in for missing rates from subsequent Building Construction schedules. The missing rates will be provided as supplemental to the Davis-Bacon Building rates issued by CSA.

The effective date for this publication will be **Friday December 10, 2010** 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. CO080012
Superseded General Decision No. CO20070012

Modification No. 14
Publication Date: 12-03-2010
(12 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) 913-5009

Attachments as listed above.

General Decision Number: CO100012 12/03/2010 CO12

Superseded General Decision Number: CO20080012

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

Modification Number	Publication Date
0	03/12/2010
1	05/07/2010
2	05/21/2010
3	06/04/2010
4	07/02/2010
5	07/09/2010
6	07/16/2010
7	08/06/2010
8	08/13/2010
9	08/20/2010
10	09/03/2010
11	09/24/2010
12	10/08/2010
13	10/29/2010
14	12/03/2010

ASBE0028-001 07/01/2010

	Rates	Fringes
Asbestos Workers/Insulator (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems).....	\$ 24.74	11.13

BRCO0007-004 01/01/2010

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

	Rates	Fringes
BRICKLAYER.....	\$ 22.48	9.54

BRCO0007-006 05/01/2010

EL PASO AND PUEBLO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 22.32	8.09

 ELEC0012-004 06/01/2009

PUEBLO COUNTY

	Rates	Fringes
ELECTRICIAN		
Electrical work where the		
cost is \$150,000 or less....	\$ 22.85	10.79
Electrical work where the		
cost is over \$150,000.....	\$ 27.00	10.91

 ELEC0068-001 06/01/2010

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

	Rates	Fringes
ELECTRICIAN.....	\$ 31.60	12.32

 * ELEC0111-001 09/01/2010

	Rates	Fringes
Line Construction:		
Cable Splicer.....	\$ 28.65	13.75%+4.75
Equipment Operator-		
Underground.....	\$ 25.06	12.75%+4.75
Groundman.....	\$ 20.48	17.75%+4.75
Line Equipment Operator.....	\$ 25.74	17.75%+4.75
Lineman and Welder.....	\$ 35.81	20.75%+4.75

 ELEC0113-002 06/01/2009

EL PASO COUNTY

	Rates	Fringes
ELECTRICIAN.....	\$ 28.80	3%+13.10

 ELEC0969-002 06/01/2009

MESA COUNTY

	Rates	Fringes
ELECTRICIAN.....	\$ 21.31	8.92

 ENGI0009-001 05/01/2010

	Rates	Fringes
Power equipment operators:		
Blade: Finish.....	\$ 23.97	9.22
Blade: Rough.....	\$ 23.67	9.22
Bulldozer.....	\$ 23.67	9.22
Cranes: 50 tons and under..	\$ 23.82	9.22
Cranes: 51 to 90 tons.....	\$ 23.97	9.22
Cranes: 91 to 140 tons.....	\$ 24.12	9.22
Cranes: 141 tons and over...	\$ 24.88	9.22
Forklift.....	\$ 23.32	9.22
Mechanic.....	\$ 25.97	9.22
Oiler.....	\$ 22.97	9.22
Scraper: Single bowl under 40 cubic yards.....	\$ 23.82	9.22
Scraper: Single bowl, including pups 40 cubic yards and over and tandem bowls.....	\$ 23.97	9.22
Trackhoe.....	\$ 23.82	9.22

IRON0024-003 11/01/2009

	Rates	Fringes
Ironworkers:.....	\$ 24.80	12.12
Structural		

LABO0086-001 05/01/2009

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

PLUM0003-005 06/01/2010

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

	Rates	Fringes
PLUMBER.....	\$ 33.37	10.35

PLUM0058-002 07/01/2010

EL PASO COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 31.55	11.45

PLUM0058-008 07/01/2010

PUEBLO COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 31.55	11.45

PLUM0145-002 07/01/2010

MESA COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 24.65	9.70

PLUM0208-004 06/01/2010

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

	Rates	Fringes
PIPEFITTER.....	\$ 33.30	10.52

SHEE0009-002 07/01/2010

	Rates	Fringes
Sheet metal worker.....	\$ 32.16	11.71

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

TEAM0435-001 05/01/2000

	Rates	Fringes
Truck drivers:		
Pickup.....	\$ 14.21	5.27
Tandem/Semi and Water.....	\$ 14.93	5.27

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

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

Career Service Authority
Supplemental to the Davis Bacon HEAVY Construction Projects
(Specific to the Denver Projects)
(Supp #58, Date: 12-10-10)

(The following rates are from the Fed/Davis Bacon/HEAVY & HIGHWAY
Mod #0 Dated 03/01/2002 to fill in for missing rates from subsequent
HEAVY Construction Schedules)

CARP2834A 05/01/2001

	Rates	Fringes
MILLWRIGHTS	22.22	5.84

ELEC0111A 09/01/2001

	Rates	Fringes
LINE CONSTRUCTION:		
Cable Splicers	26.06	19.75%+2.20
Lineman, Gas Fitter/Welder	26.56	19.75%+2.20
Line Equipment Operator,		
Line Truck Crew	20.73	19.75%+2.20
Groundman	13.64	19.75%+2.20

ENGI0009A 04/23/2001

	Rates	Fringes
POWER EQUIPMENT OPERATORS: (TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES)		
GROUP 1	20.67	5.17
GROUP 2	21.02	5.17
GROUP 3	21.12	5.17
GROUP 4	21.37	5.17
GROUP 5	21.52	5.17
GROUP 6	21.67	5.17
GROUP 7	21.92	5.17

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

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

ENGI0009B 04/23/2001

	Rates	Fringes
POWER EQUIPMENT OPERATORS:		
GROUP 1	18.52	5.17
GROUP 2	18.87	5.17

GROUP 3	19.22	5.17
GROUP 4	19.37	5.17
GROUP 5	19.52	5.17
GROUP 6	19.67	5.17
GROUP 7	20.43	5.17

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, 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; piledriver, tractor with sideboom, 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

IRON0024F 08/01/2001

	Rates	Fringes
IRONWORKERS:		
ORNAMENTAL	21.00	7.36

LABO0086A 05/01/2001

	Rates	Fringes
LABORERS:		
GROUP 1	11.75	3.64
GROUP 2	15.10	3.64
GROUP 3	15.60	3.64

LABORER CLASSIFICATIONS:

GROUP 1 - Janitors; Yardmen

GROUP 2 - including caissons to 8' carrying Reinforcing Rods; Dowel Bars; Fence Erectors; Fire Watchers on power plants and oil refineries; Gabion Basket and Reno mattresses; Signaling, Metal Mesh; pipe plants and yards; Shrubs and flowers; 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; Boring Machines; Air Hydraulic Boring machines; Automatic Concrete Power Curbing Machines; Concrete Processing Material; form setters; Highways, Streets, and Airports runways; 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 and Telephone Conduit; Enamalers on Pipe, inside and out, Mechanical Grouters; Monitors; Jeep Holiday Detector Men; Pump Operators; Rakers; Vibrators; Hydro-broom, Mixer Man; Gunnite Nozzelmen; Shotcrete Operator; and chain saws, gas and electric; Sand Blaster; Licensed Powdermen; Powdermen and Blaster; Siphons; Signalmen; Dumpman/spotter; Grade Checker.

GROUP 3 - Plug and galleys in dams; Scalers; 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

LABO0086B 05/01/2001

	Rates	Fringes
LABORERS: (TUNNEL)		
GROUP 1	15.05	3.64
GROUP 2	15.95	3.64
GROUP 3	16.05	3.64
GROUP 4	17.15	3.64
GROUP 5	17.10	3.64

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.

LABO0086D 05/01/2001

	Rates	Fringes
LABORERS:		
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	18.45	3.64

TEAM0435A 05/01/2000

	Rates	Fringes
TRUCK DRIVERS:		
GROUP 1	14.21	5.27
GROUP 2	14.93	5.27

GROUP 3	15.27	5.27
GROUP 4	15.80	5.27
GROUP 5	16.45	5.27
GROUP 6	17.25	5.27

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.

=====

Project Manual

For:

**SWANSEA PARK
Master Plan and Irrigation Improvements**

CONTRACT CONTROL NUMBER: 201100726

CITY AND COUNTY OF DENVER

Prepared by:



TECHNICAL SPECIFICATIONS
TABLE OF CONTENTS

DIVISION 1 - GENERAL REQUIREMENTS

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APPENDIX

- A. Erosion Control Narrative
- B. Sample Inspection Report
- C. Central Control Certification Checklist

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to Work of this Section.
- 1.2 DESCRIPTION: This section includes general description of the Work with limitations or coordination with other contracts, if any.
- 1.3 GENERAL:
- A. The Work to be done under this Contract is the construction of the Work as shown, documented, and set forth in the Contract Documents, in a workmanlike manner, to the satisfaction of the Owner.
 - B. If these documents or job conditions make it impossible to produce first class work or to warranty the work or the Contractor's performance, or should discrepancies appear among the Contract Documents, the Contractor must immediately request interpretation, correction or clarification in accordance with General Condition 404.
 - C. Should a conflict occur in or between Drawings and Specifications, Contractor is deemed to have estimated on the more expensive way of doing work unless he shall have asked for and obtained written decision before submission of Bid as to which method or materials will be required.
 - D. The Contractor represents that he fully understands the nature and extent of the Work, all factors and conditions affecting or which may be affected by it and characteristics of its various parts and elements and their fitting together and functioning.
- 1.4 DESCRIPTION OF WORK: The following work items are included in these specifications: Site improvements including but not limited to: demolition of existing asphalt walks, earthwork; erosion control; drainage; concrete walks and other flatwork; concrete curb walls; irrigation system replacement; soil preparation; sodding; seeding; protection and retention of existing trees, planting new trees, installation of baseball field, installation of sand volleyball, installation of entry gateway; installation of basketball court and installation of horseshoe pit.. 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.

Owner: City & County of Denver, Webb Building, 201 West Colfax Avenue, Denver, CO 80202.

Project location: 49th Avenue and Clayton Street
Denver, CO 80203

PART 2 - PRODUCTS (Not applicable)PART 3 - EXECUTION (Not applicable)

END OF SECTION 01010

PART 1: GENERAL

1.1 DESCRIPTION

A. General:

1. All measurements and payments will be based on work completed in strict accordance with the plans and specifications for the project.
2. 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.
3. See the General Contract 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, except asphalt pavement.
2. Quantities will be rounded off to the nearest whole number.
3. The Contractor shall, in the presence of the Owner or Owner, 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 Owner multiplied by the unit price for work which is incorporated in or made necessary by the Work.

BID SCHEDULE

BID ITEM NO. 01010-1 - MOBILIZATION

- A. Measurement: Mobilization will not be measured but will be a lump sum item. Fifty percent (50%) of the lump sum price for this item will be paid when ten percent (10%) of the original contract amount is earned. The balance of the lump sum bid price will be paid when fifty percent (50%) of the original contract amount is earned.
- B. Payment: The lump sum price shall include all the Contractor's costs including labor, material, and any incidental work and equipment necessary for mobilization of personnel, equipment and supplies at the project site. This item shall also include the establishment of the Contractor's fenced staging area, portable toilets and other necessary temporary facilities, grading and restoration of staging area, and all other costs incurred of labor and operations which must be performed prior to beginning the other items under this contract including acquiring all required permits.

The lump sum price shall also include the following: signage; repair and restoration of any damage to pavement or landscape areas caused by construction under this contract; repairs due to vandalism, and job site security. The removal of the Contractor's equipment, supplies, excess materials, and cleanup of the site is also included in this item. Pedestrian Traffic Control within the park (signage) is included in this item. Vehicular Traffic Control in the Right of Way and Temporary Protective Fencing will not be included in mobilization, but will be measured and paid for separately.

BID ITEM NO. 01050-1 – CONSTRUCTION SURVEYING

- A. Measurement: Construction surveying will not be measured but will be a lump sum item.
- B. Payment: The lump sum price shall include all of the Contractor's costs including labor, materials, and incidental work and equipment necessary to complete the construction surveying work.

BID ITEM NO. 01400-1 – MATERIALS TESTING

- A. Measurement: Materials testing will not be measured but will be a lump sum item.
- B. Payment: The lump sum price shall include all of the Contractor's costs associated with materials testing per specifications.

BID ITEM NO. 01500-1 – 6'-HIGH PORTABLE CHAIN LINK FENCE WITH GATE

- A. Measurement: Measurement for fencing shall be the actual number of linear feet of temporary protective fencing installed where shown on the plans and as directed by the Owner.
- B. Payment: Payment will be made at the unit price bid and shall include all of the Contractor's costs, including maintenance of protective fencing as needed through the duration of the project. This item also includes removal of temporary fencing and restoration of the site to match adjacent condition. This item will not include fencing used to protect individual trees, which will be measured and paid for under Tree Protection.

BID ITEM NO. 01565-1 – SILT FENCE

- A. Measurement: Measurement for silt fence shall be the actual number of linear feet of silt fence installed where shown on the plans and in accordance with the specifications, and as directed by the Owner.
- B. Payment: Payment for this item shall include all the Contractor's costs of whatever nature to control erosion and sedimentation by means of the silt fence, in accordance with the Specifications and as directed by the Owner. The price bid shall include regular cleaning and disposal of debris, and all other related work and equipment required maintain the silt fence for the duration of the project. The price shall also include removal of the silt fence when no longer needed or as directed, and restoration of the site to match adjacent conditions.

BID ITEM NO. 01565-2 – STABILIZED STAGING AREA

- A. Measurement: Measurement for stabilized staging area shall be lump sum installed where shown on the plans in accordance with the details, and as directed by the Owner.
- B. Payment: Payment for this item shall include all the Contractor's costs of whatever nature to control stabilized staging area, in accordance with the Specifications and as directed by the Owner. The price shall also include removal of the stabilized staging area when no longer needed or as directed, and restoration of the site to match adjacent conditions.

BID ITEM NO. 01565-3 – VEHICLE TRACKING CONTROL

- A. Measurement: Measurement for vehicle tracking control shall be lump sum installed where shown on the plans in accordance with the details, and as directed by the Owner.
- B. Payment: Payment for this item shall include all the Contractor's costs of whatever nature to do vehicle tracking control, in accordance with the Specifications and as directed by the Owner. The price bid shall include regular cleaning and disposal of debris, and all other related work and equipment required to maintain the vehicle tracking devices for the duration of the project. The price shall also include removal of the vehicle tracking control when no longer needed or as directed, and restoration of the site to match adjacent conditions.

BID ITEM NO. 01565-4 – CONCRETE CHUTE WASHOUT

- A. Measurement: Concrete chute washout will not be measured but will be paid as a lump sum item.

- B. Payment: Payment for this item shall include all the Contractor's costs of whatever nature to install the concrete chute washout, in accordance with the plans and specifications and as directed by the Owner. The price bid shall include regular cleaning and disposal of debris, and all other related work and equipment required to maintain the concrete chute washout for the duration of the project. The price shall also include removal of the concrete chute washout when no longer needed or as directed, and restoration of the site to match adjacent conditions.

BID ITEM NO. 02050-1 – REMOVE CONCRETE PAVING

- A. Measurement: Measurement for removal and disposal of concrete paving will be a lump sum item.
- B. Payment: The lump sum price for this item shall include all of the Contractor's costs, including labor, materials, and incidental work and equipment necessary to complete the work. The price bid shall include: sawing or otherwise effectively cutting the existing paving smoothly and squarely in a manner satisfactory to the Owner; and removal and off-site disposal of the paving material and any base course. No payment will be made for the removal and/or replacement of any paving damaged by the Contractor beyond the authorized limits of removal.

BID ITEM NO. 02050-2 – REMOVE ASPHALT PAVING

- A. Measurement: Measurement for removal and disposal of asphalt paving will be a lump sum item.
- B. Payment: The lump sum price shall include all of the Contractor's costs including labor, materials, and equipment necessary to remove and dispose of asphalt, in accordance with the plans and at the direction of the owner. No payment will be made for the removal and/or replacement of any paving damaged by the Contractor beyond the authorized limits of removal.

BID ITEM NO. 02050-3 - REMOVE INFIELD MIX AND BACKSTOP

- A. Measurement: Measurement for removal infield mix and backstop will be a lump sum item.
- B. Payment: The unit price bid for this item shall include all of the Contractor's costs, including labor, materials, and incidental work and equipment necessary to complete the work. The price shall include and removal and off-site disposal of infield mix and backstop unless designated for reuse on site by owner. No payment will be made for the removal and/or replacement of any material damaged by the Contractor beyond the authorized limits of removal.

BID ITEM NO. 02050-4 – RELOCATE PLAYERS BENCHES

- A. Measurement: Measurement for player benches relocation will be lump sum item.
- B. Payment: Payment for this item shall include all of the Contractor's costs of whatever nature to remove and relocate the two player benches, in accordance with the plans and Specifications and as directed by the Owner.

BID ITEM NO. 02050-5 – REMOVE BOLLARDS

- A. Measurement: Measurement for bollard removal will be lump sum item.
- B. Payment: Payment for this item shall include all of the Contractor's costs of whatever nature to remove bollards and turnover to Owner in accordance with the plans and Specifications and as directed by the Owner.

BID ITEM NO. 02050-6 - REMOVE SOD

- A. Measurement: Measurement for removal of sod will be on a square foot basis.
- B. Payment: The unit price bid for this item shall include all of the Contractor's costs, including labor, materials, and incidental work and equipment necessary to complete the work. The price shall include and removal and off-site disposal of sod. No payment will be made for the removal and/or replacement of any material damaged by the Contractor beyond the authorized limits of removal.

BID ITEM NO. 02050-7 – REMOVE GUARDRAIL

- A. Measurement: Measurement for removal of vehicle barrier will be lump sum item.
- B. Payment: Payment for this item shall include all of the Contractor's costs of whatever nature to remove and dispose of vehicle barrier in accordance with the plans and Specifications and as directed by the Owner. This item also includes installing the two terminal sections and signage guardrail opening shown on sheet L-3.1.

BID ITEM NO. 02150-1 – TREE PROTECTION FENCING

- A. Measurement: Measurement for fencing shall be the actual number of linear feet of temporary protective 4' high plastic tree protection fencing installed where shown on the plans and as directed by the Owner.
- B. Payment: Payment will be made at the unit price bid and shall include all of the Contractor's costs, including maintenance of protective fencing as needed through the duration of the project. This item also includes removal of temporary fencing and restoration of the site to match adjacent condition.

BID ITEM NO. 02200-1 – EARTHWORK

- A. Measurement: Earthwork shall not be measured but will be a lump sum item. Exceptions will be made when field changes are ordered or when it is determined that there are discrepancies on the plans in an amount of at least plus or minus five percent of the plan quantity. Excavation shall include all types of soil, earth, or rock, and all debris, trash, rock, or other materials encountered which must be removed in order to allow construction to the lines and grades shown on the plans.
- B. Payment: Payment shall include all equipment, excavation, loading, transporting, stockpiling, disposing, hauling off, importing fill, re-transporting to fill locations (from locations of excavation or from on-site or off-site stockpiles), watering, compaction, subgrade preparation, measuring of subgrade to bring within tolerances, backfilling, dust control, mud control, rough grading, fine grading as required to bring the site to the required lines and grades, and the stripping and stockpiling of topsoil.

BID ITEM NO. 02520-1 – CONCRETE PAVEMENT (6" THICK)

- A. Measurement: Measurement will be made of the actual number of square feet of concrete flatwork placed and accepted at the locations shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of materials; formwork; fibrous reinforcing; dowels; finishing; joints; protective coatings; curing; sweeping; washing; cleanup and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02520-2 – VOLLEYBALL CURBWALLS

- A. Measurement: Measurement will be of the actual number of linear feet of volleyball curbs placed and accepted at the locations shown on the Drawings or as directed by the Owners, and in accordance with the Specifications and details included herein.
- B. Payment: Payment will be made at the unit price bid and shall include all equipment, furnishing and installation of concrete, formwork, reinforcing, joints, curing, finishing, subgrade preparation, and other items required to complete the work.

BID ITEM NO. 02520-3 – THICKENED EDGE CONCRETE

- A. Measurement: Measurement for thickened edge concrete will be measured as linear foot and installed in accordance with the plans and specifications.
- B. Payment: Payment will be made as per linear foot and shall include all labor, materials, and equipment required for installing the thickened edge as called out and detailed on the plans.

BID ITEM NO. 02520-4 – 24” CONCRETE MOW BAND AT OUTFIELD FENCING

- A. Measurement: Measurement for concrete mow band will be measured as linear foot and installed in accordance with the plans and specifications.
- B. Payment: Payment will be made as per linear foot and shall include all labor, materials, and equipment required for installing the 24” concrete mow band at outfield fencing as called out and detailed in the plans and specifications.

BID ITEM NO. 02520-5 – CONCRETE CURB AND GUTTER

- A. Measurement: Measurement for concrete curb and gutter will be measured as linear foot and installed in accordance with the plans and specifications.
- B. Payment: Payment will be made as per linear foot and shall include all labor, materials, and equipment required for installing the concrete curb and gutter as called out and detailed on the plans.

BID ITEM NO. 02520-6 – 6” CONCRETE MOW CURB

- A. Measurement: Measurement for concrete mow curb will be measured as linear foot and installed in accordance with the plans and specifications.
- B. Payment: Payment will be made as per linear foot and shall include all labor, materials, and equipment required for installing the concrete mow curb as called out and detailed on the plans.

BID ITEM NO. 02710-1 - 4” DIAMETER PERFORATED PVC SDR-35 SUBSURFACE DRAIN

- A. Measurement: Measurement will be made of the actual number of linear feet of 4” PVC perforated drainage pipe placed and accepted at the locations shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment shall include: furnishing, transporting and installing all pipe and materials; fittings, joints and joint materials; trenching; stone filter material; geotextile fabric; connections to other pipes or structures; compaction as specified; and all other related and necessary materials, work, and equipment required to construct a complete operable drainage pipe.

BID ITEM NO. 02710-2 – DRAINAGE IMPROVEMENTS AT NEW BASEBALL FIELD

- A. Measurement: Measurement will be made as a Lump Sum for this item
- B. Payment: Payment shall include: furnishing, transporting and installing all pipe and materials; fittings, joints and joint materials; trenching; bedding material, connections to other pipes or structures; and compaction as specified as called out on civil plans; and all other related and necessary materials, work, and equipment required to construct a complete the baseball field drainage improvements.

BID ITEM NO. 02710-3 – DRY WELL AT VOLLEYBALL

- A. Measurement: Measurement for dry well will be measured lump sum and installed in accordance with the plans and specifications.
- B. Payment: Payment shall include: furnishing, transporting and installing all materials necessary for installation of dry well; compaction as specified; and all other related and necessary materials, work, and equipment required to construct a complete product.

BID ITEM NO. 02740-1 – ASPHALTIC CONCRETE PAVING

- A. Measurement: Measurement for asphaltic concrete paving will be measured lump sum and installed in accordance with the plans and specifications.
- B. Payment: Payment shall include: furnishing, transporting and installing all materials necessary for installation of asphaltic concrete paving; compaction as specified; and all other related and necessary materials, work, and equipment required to construct a complete operable dry well.

BID ITEM NO. 02810-1 – REMOVAL OF EXISTING IRRIGATION EQUIPMENT

- A. Measurement: Removal of existing irrigation equipment will not be measured but will be paid for as a lump sum item.
- B. Payment: Payment for this item shall include the complete removal of all existing irrigation heads, valves, manifolds, valve boxes, controller and all other exposed irrigation equipment within those areas of irrigation rehabilitation. Backfilling of the holes thus created shall be included in the lump sum price. Existing irrigation piping may be abandoned in place, although the price shall include disconnecting all pressure piping from its water source. All equipment is to be surrendered to the parks department.

BID ITEM NO. 02810-2 – IRRIGATION SYSTEM INSTALLATION

- A. Measurement: Measurement will be made as a lump sum for the irrigation system installation.

- B. Payment: Payment for this item shall include furnishing, transporting and installing all irrigation system components called out on the plans and specifications.

BID ITEM NO. 02810-3 – IRRIGATION SYSTEM TRENCH BORING

- A. Measurement: Measurement will be made for the actual number of linear feet of irrigation trench boring placed and accepted at the locations shown on the Drawings or as directed by the Owner and City Forester, and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of irrigation trench boring, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02810-4 – IRRIGATION ANTENNA SUPPLY

- A. Measurement: Measurement will be made as a lump sum fee for the irrigation antenna.
- B. Payment: Payment will be made at the unit price bid and shall include: supplying irrigation antenna as called out on the irrigation plans. Contractor to turn antenna over to Denver Parks for installation.

BID ITEM NO. 02831-1 – BACKSTOP FENCING

- A. Measurement: Measurement for the backstop fencing will be made on a lump sum basis.
- B. Payment: Payment for this item shall include furnishing, transporting and installing everything called out on the plans and specifications for installation of the backstop

BID ITEM NO. 02831-2 – OUTFIELD FENCING

- A. Measurement: Measurement for the outfield fencing will be made on a lineal foot basis.
- B. Payment: Payment for this item shall include furnishing, transporting and installing the outfield fencing and player bench fencing and gate as called out on the plans and specifications.

BID ITEM NO. 02865-1 – SAND SURFACING

BID ITEM NO. 02865-2 – INFIELD MIX SURFACING

- A. Measurement: Measurement for sand or infield mix surfacing material will be the actual number of square feet of material furnished and installed where shown on the plans and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include all labor, materials, and equipment required for installing the infield mix material and sand.

BID ITEM NO. 02932-1 – NATIVE SEEDING

- A. Measurement: Measurement will be made of the actual number of square feet of native seed installed and accepted at each project location where shown on the drawings or as directed the Owner.
- B. Payment: Payment for this item will include all the Contractor's costs of whatever nature to complete the seeding in accordance with the Specifications. Payment shall include: soil preparation, including furnishing and installation of soil amendments and fertilizers;

disking, raking, spreading, and fine grading; furnishing and installation of seed and mulch materials; temporary protection by fencing or other means; watering and all other required maintenance until Final Acceptance of the work.

BID ITEM NO. 02932-2 – TURFGRASS SEEDING OVER TRENCHES

- A. Measurement: Measurement will be made as a lump sum for turfgrass seed installed and accepted where shown on the Drawings or as directed by the Owner. Areas disturbed outside the designated limit of work will not be measured, but will be restored at the contractor's own expense.
- B. Payment: Payment for this item will include all the Contractor's costs of whatever nature to complete the seeding in accordance with the Specifications. Payment shall include: soil preparation, including furnishing and installation of soil amendments and fertilizers; disking, raking, spreading, and fine grading; furnishing and installation of seed and mulch materials; temporary protection by fencing or other means; watering and all other required maintenance until Final Acceptance of the work.

BID ITEM NO. 02935-1 – SODDING

- A. Measurement: Measurement will be made of the actual number of square feet of bluegrass sod installed and accepted at each project location where shown on the drawings or as directed the Owner.
- B. Payment: Payment for this item will include all the Contractor's costs of whatever nature to complete the sodding in accordance with the Specifications. Payment shall include: soil preparation, including furnishing and installation of soil amendments and fertilizers; discing, raking, spreading, and fine grading; furnishing and installation of sod; watering and all other required maintenance until Final Acceptance of the work.

BID ITEM NO. 02950-1 – 2" DECIDUOUS TREES

- A. Measurement: Measurement will be made of the actual number of trees placed and accepted at the locations shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of plants, excavation, backfill, mulching and watering until Final Acceptance, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02950-2 – WOOD MULCH

- A. Measurement: Measurement will be made of the actual number of square feet of wood mulch placed where shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment shall include furnishing and installing wood mulch in accordance with the Drawings and Specifications.

BID ITEM NO. 02960-1 – INSTALLATION OF BASKETBALL HOOPS AND COURT STRIPING

- A. Measurement: Measurement for the basketball hoops and court striping will be made on a lump sum basis.

- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of basketball hoops and court striping, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02960-2 – INSTALLATION OF BASES AND BASE ANCHORS

- A. Measurement: Measurement will be made of the actual number of bases and base anchors placed and accepted at the locations shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of bases and base anchors, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02960-3 – INSTALLATION OF VOLLEYBALL EQUIPMENT

- A. Measurement: Measurement for volleyball equipment will be a lump sum for all installed per plans and specifications and in accordance with the Owner.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of volleyball equipment, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02960-4 – INSTALLATION OF HORSESHOE PITS

- A. Measurement: Measurement for installation of horseshoe pits will be a lump sum for all of the area including walks, bench, curbs, sand, horseshoe equipment, backboards and mulch beds installed per plans and specifications and in accordance with the Owner.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of horseshoe pits including walks, bench, curbs, sand, horseshoe equipment, backboards and mulch beds , and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02960-5 – INSTALLATION OF REMOVABLE BOLLARDS

- A. Measurement: Measurement will be made of the actual number of removable bollards placed and accepted at the locations shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of removable bollards, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 02960-6 – INSTALLATION OF POST AND CHAIN

- A. Measurement: Measurement will be made for the actual number of linear feet of post and chain placed and accepted at the locations shown on the Drawings or as directed by the Owner, and in accordance with the Specifications.
- B. Payment: Payment will be made at the unit price bid and shall include: furnishing and installation of post and chain, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

BID ITEM NO. 05500-1 – INSTALLATION OF GATEWAY

- A. Measurement: Measurement for installation of the gateway will be a lump sum.
- B. Payment: Payment will be made at the unit price bid and shall include: fabrication and installation of the gateway and footings, and other items necessary to complete the work as shown on the Drawings and in accordance with the Specifications.

END OF SECTION 01025

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to Work of this section.

1.2 SUMMARY:

A. Section Includes: Requirements for 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. Related Work:

1. Construction Surveying: Section 01050
2. Administration, Procedures, Codes: Section 01105
3. Project Meetings: Section 01200
4. Playground Equipment: Section 02861

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 Owners Representative 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 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 Section 01200. 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 Drawings. Lay out 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 Owner. The Contractor shall provide surveying for the layout of all improvements including both horizontal and vertical control, in accordance with the requirements of Section 01050.
 - 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: 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: 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 applicable)

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 Owner 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 Owner 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.

END OF SECTION 01040

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to work of this section.
- 1.2 SUMMARY:
- A. Section includes: general requirements and procedures for construction surveying.
 - B. Related Work:
 - 1. Layout of site improvements – see affected Division 2 Sections:
 - a. Earthwork,
 - b. Concrete walks, curbs and miscellaneous flatwork.
- 1.3 EXISTING UTILITIES:
- A. The existence and location of underground utilities and construction indicated as existing are not guaranteed.
 - B. Before starting any work disturbing, moving or penetrating the ground, the Contractor must have all existing utilities located, staked, and depth identified by the appropriate entity.

PART 2 - PRODUCTS (Not Applicable)PART 3 - EXECUTION

- 3.1 CONSTRUCTION SURVEYING:
- A. Construction surveying shall comply with General Conditions 317 and 318.
 - B. The work shall consist of the surveying, calculating, and staking necessary for the construction of all elements of the project. Layout of site elements will be accomplished either by means of coordinates or traditional baseline method or a combination of both.

END OF SECTION 01050

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to work of this section.
- 1.2 SUMMARY: 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 Condition 316.
 - B. Publication Dates: Comply with General Condition 401.2.
- 1.4 EXISTING UTILITIES:
- A. Locate and protect existing utilities in accordance with General Condition 804.
 - B. Although existing utilities may be shown on the drawings, their location is not guaranteed.
- 1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE
- A. Furnish construction schedule, as required by General Condition 306.
 - B. IMPORTANT: Prior to beginning work on project site, the Contractor shall give minimum 48 hour notification to both the Owner 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 10-year historical weather information provided by the local branch of the U.S. Weather Service. 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 Applicable)

PART 3 – EXECUTION (Not applicable)

END OF SECTION 01105

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to work of this section.

1.2 SUMMARY:

A. This section includes administrative and procedural requirements for project meetings in the following categories:

1. Pre-construction meeting
2. Progress and Coordination meetings
3. Owner-General Contractor review meetings

B. Related Work:

1. Progress schedules: Section 01105

1.3 GENERAL REQUIREMENTS:

A. Owner shall schedule a pre-construction meeting, weekly progress meetings and coordination meetings, and specially called meetings throughout progress of the work including the following:

Owner shall:

1. Preside at meetings.

Contractor shall:

1. Prepare agenda for meetings.
2. Distribute written notice of each meeting a minimum of four (4) days in advance of meeting date. Make physical arrangements for meetings.
3. Record the minutes; include significant proceedings and decisions.
4. Include all issues of previous meetings until resolved.
5. Reproduce and distribute copies of minutes within four (4) days after each meeting and send to:
 - a. Participants in the meeting
 - b. Parties affected by decisions made at the meeting

B. Representatives of Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. Site observations required of the Owner shall be included in or coordinated with the regularly scheduled meetings whenever possible.

1.4 PRE-CONSTRUCTION MEETING:

A. Owner shall schedule a pre-construction meeting to take place within ten (10) days prior to date of Notice to Proceed at a central site location designated by the Owner.

Attendance shall include:

1. Owner
2. Contractor and Contractor's Superintendent
3. Maintenance District Superintendent
4. Others as appropriate

B. Suggested Agenda: Discuss items of significance that could affect progress including such topics as:

1. Tentative construction schedule
2. Critical Work sequencing
3. Designation of responsible personnel
4. Procedures for processing field decisions and Change Orders
5. Procedures for processing Applications for Payment
6. Distribution of Contract Documents
7. Submittal of Shop Drawings, Product Data and Samples
8. Preparation of record documents
9. Use of the premises
10. Office, Work and storage areas
11. Equipment deliveries and priorities
12. Safety procedures
13. First aid
14. Security
15. Housekeeping
16. Working hours
17. Temporary construction facilities and utilities

1.5 COORDINATION MEETINGS:

A. The Owner will schedule weekly job progress and coordination meetings at the site. Attendance shall include:

1. Contractor
2. Subcontractors, as appropriate to the agenda
3. Suppliers, as appropriate to the agenda
4. Owner
5. Others

B. Suggested Agenda:

1. Review, approval of minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede Construction Schedule.
5. Review of off-site fabrication, delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to construction schedule.
8. Progress, schedule, during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Review proposed changes for:
 - a. Effect on construction schedule and on completion date.

b. Effect on other contracts of the project.

1.6 OWNER-GENERAL CONTRACTOR REVIEW MEETINGS:

- A. Meetings shall be scheduled as necessary to review the general progress of the job and discuss all relevant open issues. The General Contractor's superintendent shall attend these meetings unless agreed to otherwise. Additionally, Subcontractors shall be invited to attend as required and agreed to by the Owner. The Owner shall preside at meetings. Contractor shall take complete minutes. All items shall be tracked in minutes until resolved. Suggested Agenda is similar to Article 1.5.

PART 2 PRODUCTS (Not applicable)

PART 3 EXECUTION (Not applicable)

END OF SECTION 01200

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General contract Conditions, Drawings and other Division 1 - Specification sections apply to work of this section.
- 1.2 SUMMARY: Section includes administrative and procedural requirements for submittal and review of product data, shop drawings, samples and similar items required by the specifications.
- 1.3 ADMINISTRATIVE SUBMITTALS:
- A. Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
1. Schedules
 2. Permits
 3. Applications for payment
 4. Schedule of Values
 5. Closeout documents
 6. Coordination drawings
- B. With the exception of the applications for payment, such submittals are for information and record and do not require action on the part of the Owner except where not in conformity with the Contract Documents. If such non-conformity is observed, the Owner will notify the Contractor. Failure to be observed or to be notified by the Owner does not relieve Contractor of compliance with Contract Documents.
- 1.4 SUBMITTAL PROCEDURES:
- A. General: Make submittals from Contractor to the Owner after Contractor has reviewed each submittal and indicated his action thereon except for samples and selection submittals.
- B. Scheduling:
1. Within 20 days after Notice to Proceed, prepare a separate listing and schedule organized by related specification section number sequence, showing the principal work-related submittals and their initial submittal dates as required for coordination of the work.
 2. Coordinate the submittal schedule with the construction schedule. Prepare the submittal schedule in chronological order.
- C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.
- D. Coordination:

1. Coordinate the preparation and processing of submittals with the performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
3. Coordinate transmittal of different types of submittals for related elements of Work so processing will not be delayed by the need to review submittals concurrently for coordination.
4. The Owner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

E. Processing:

1. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.
2. Allow sufficient time for processing each submittal.
3. No extension of Contract Time will be authorized because of failure to transmit submittals to the Owner sufficiently in advance of the Work to permit processing.

F. Submittal Transmittal:

1. Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to the Owner using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
2. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.5 SHOP DRAWINGS:

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project shall not be considered to be a shop drawing. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
1. Dimensions
 2. Identification of products and materials included
 3. Compliance with specified standards
 4. Notation of coordination requirements
 5. Notation of dimensions established by field measurement
- B. Submit four (4) copies of each shop drawing.

1.6 PRODUCT DATA:

- A. Assemble Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation

instructions, catalog cuts, standard color charts, rough-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings". Where applicable, include maintenance manual.

- B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - 1. Manufacturer's printed recommendation.
 - 2. Compliance with recognized trade association standards.
 - 3. Application of testing agency labels and seals.
 - 4. Notation of dimensions verified by field measurement.
 - 5. Notation of coordination requirements.
- C. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
- D. Submit copies as above specified for final shop drawings. Submit a cover letter to show Contractor's review and action. Where applicable, include additional copies for maintenance manuals.
- E. Submit four (4) copies of product data.

1.7 SAMPLES:

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components. Include the following:
 - 1. Generic description of the Sample.
 - 2. Sample source.
 - 3. Product name or name of manufacturer or supplier.
 - 4. Compliance with recognized standards.
 - 5. Availability and delivery time.
- B. Submit Samples to the Owner who will review them for a final check of elements and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - 1. Where variation in characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
 - 2. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
- C. Submittals:
 - 1. Except for Samples illustrating assembly details, workmanship, fabrication

techniques, connections, operation and similar characteristics, submit three (3) sets: one will be returned marked with the action taken.

2. Maintain one (1) complete set of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

D. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01300

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division 1- Specification sections apply to work of this section.
- 1.2 SUMMARY:
- A. This Section describes administrative and procedural requirements for quality control services, including:
 - 1. Field samples
 - 2. Mock-ups
 - 3. Inspection and testing laboratory services
 - 4. Manufacturer's field services and reports
 - B. Related Work:
 - 1. Submittals: Section 01300
 - 2. Inspections and tests required and standards for testing: Individual Specification Sections
- 1.3 REFERENCES:
- A. ASTM D3740, "Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction".
 - B. ASTM E329, "Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction".
 - C. Should specified reference standards conflict with the Contract Documents, request clarification from the Owner before proceeding.
- 1.4 DEFINITIONS:
- A. Quality control services include inspections and tests, and related actions, including reports, performed by independent agencies, governing authorities, and the Contractor. Contract enforcement activities performed by the Owner are not included.
 - B. Inspection and testing services required to verify compliance with requirements specified do not relieve the Contractor of responsibility to comply with requirements of the Contract Documents.
 - C. Requirements of this Section relate to customized fabrication and installation procedures and not production of standard products.
 - 1. Specific quality control requirements, inspections and tests, covering production, customized fabrication and installation procedures of standard products are specified in the individual sections.
 - 2. Inspections, tests and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract

Documents.

3. Requirements for the Contractor to provide quality control services requested by the Owner or authorities having jurisdiction are not limited by provisions of this Section.

1.5 RESPONSIBILITIES:

A. Contractor Responsibilities:

1. The Contractor shall provide inspections, tests and similar quality control services, specified in individual specification sections and required by governing authorities, except where they are indicated to be the responsibility of the City, or are provided by another entity. Costs for City services shall not be included in the Contract Sum or bid item.
2. Notify the Project Manager at least one (1) working day in advance so that the Project Manager may observe the tests.

B. Retesting:

1. The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not meet specified requirements, regardless of whether the original test was the Contractor's responsibility.
2. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility regardless of the results, where required tests were performed on original construction.

C. Limitations: Where manufactured products or equipment are required to have representative samples tested, do not use such materials or equipment until tests have been made and the materials or equipment are found to be acceptable. Do not incorporate in the work any product that becomes unfit for use after acceptance.

D. Associated Services: The Contractor shall cooperate with Owner or other agencies performing required inspections, tests and similar services and provide reasonable associated services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Associated services required include:

1. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
2. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
3. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
4. Providing adequate facilities for safe storage and proper curing of concrete test cylinders on the project site for the first 24 hours after casting as required by ASTM C31.
5. Providing the agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.
6. Security and protection of samples and test equipment at the project site.

E. City's Responsibilities:

1. The Owner will arrange for inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by authorities having jurisdiction or another identified entity. Costs for these services are not included in the Contract Sum.
2. The City will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services that are the City's responsibility.
3. Duties of Testing Agency:
 - a. The independent testing agency engaged to perform inspections, sampling and testing of materials shall cooperate with the City and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
 - b. The agency shall notify the City and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - c. The agency is not authorized to release, revoke, alter or enlarge any requirement of the Contract Documents, or approve or accept any portion of the Work.
 - d. The agency shall not perform any duties of the Contractor.
4. Coordination:
 - a. The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 - b. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.6 SUBMITTALS:

- A. General: Refer to Section 01300 for general requirements of submittals. Certified written report of each inspection, test or similar service, will be submitted directly to the Owner except to the Contractor with copy to the Owner when service is the Contractor's responsibility. Submit additional copies directly to governing authorities when requested by that authority.
- B. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 1. Date of issue.
 2. Project title and number.
 3. Dates and locations of samples and tests or inspections.
 4. Names of individuals making the inspection or test.
 5. Designation of the work and test method.
 6. Identification of product and specification section.
 7. Complete inspection or test data.
 8. Test results and interpretation of test results.
 9. Ambient conditions at the time of sample taking and testing.
 10. Comments or professional opinion as to whether inspected or tested work complies with Contract Document requirements.
 11. Name and signature of laboratory inspector.

12. Recommendations on retesting.

1.7 QUALITY ASSURANCE:

- A. Qualification of Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by American Council of Independent Laboratories, which are recognized in the industry as specialized in the types of inspections and tests to be performed and which have not less than five (5) years experience in such testing.
- B. Comply with requirements of ASTM E329 and ASTM D3740.
 - 1. Each inspection and testing agency shall be authorized to operate in the State of Colorado.
 - 2. Maintain a full time registered engineer on staff to review services.
 - 3. Calibrate testing equipment at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or of accepted values of natural physical constants.
- C. Control of Installation:
 - 1. Monitor quality control over products, services, site conditions, and workmanship to produce work of specified quality.
 - 2. Comply fully with manufacturers' instructions, including each step in sequence.
 - 3. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner before proceeding.
 - 4. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 - 5. Perform work by persons qualified to produce workmanship of specified quality.

1.8 FIELD SAMPLES:

- A. Install field samples for review at the site as required by individual specification sections.
- B. Assemble and erect specified items with specified or required attachment and anchorage devices, flashings, seals, and finishes.

1.9 INSPECTION AND TESTING LABORATORY SERVICES:

- A. Perform inspections, tests and other services specified in individual specification sections.
- B. Submit reports indicating observations and results of tests indicating compliance or non-compliance with Contract Documents.

1.10 MANUFACTURER'S FIELD SERVICES:

- A. When specified in respective Specification sections, Contractor shall require supplier or

manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable, and to make appropriate recommendations.

- B. Manufacturer's representative shall submit written report to the Owner listing observations and recommendations.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 The Contractor will provide for testing, through an approved third party testing agency, for soil and aggregate compaction, concrete, asphalt, and inert groundcover materials. The Contractor will pay for any retesting as a result of test failures.

3.2 REPAIR AND PROTECTION:

- A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.
- B. Protect construction exposed by or for quality control service activities, and protect repaired construction.
- C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

3.3 SCHEDULE OF INSPECTIONS AND TESTS: The following is a summary of tests and inspections specified in the appropriate sections and compiled here for convenience of reference. Additional testing as referenced in individual sections will also be required.

- A. Testing provided By Contractor:
 - 1. Fill and backfill compaction density tests: Section 02200.
 - 2. Asphalt Pavement: Section 02510.
 - 3. Concrete walks: Section 02520.
 - 4. Concrete testing: Section 03300.
 - 5. Contractor to pay for retesting if further tests are required.
 - 6. Testing of Water Lines: In conformance with City Standards.
- B. Schedule of quality control tests and inspections.

<u>Test/Inspection Description</u>	<u>ASTM Test Frequency</u>
Section 02200:	
Fill and backfill material	1 per each soil type
Proctor	D698
Plasticity index	D4318

Particle size analysis	D422
Field density tests	D2922
Field moisture tests	D3017
General fills for building and paved areas	1 per 2000 SF per lift
Backfill	1 per 250 SF per lift
Site work	1 per 400 CY per lift
Utility lines	1 per 150 LF per lift

Section 02510:

Asphaltic Concrete or Hot Mix Asphalt (HMA)	1/day or each 500 tons
Hveem Properties (Rice, Air Voids, VMA)	CDOT CP-51, CP-48
Extraction/gradation	D2172, C136 or CDOT CP-L5120 and CP-31
Field density compaction tests by Nuclear gauge or cores	D2950, CDOT CP-44

Section 03300:

Reinforcing steel	Examine reinforcing before each pour
Fresh Concrete Physical Properties (slump, air, entrainment, unit weight)	concrete physical properties on each truck. C172, C173, C 143, C39, 1/50 CY
Compressive strength	

END OF SECTION 01400

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division 1- Specification sections apply to this section.
- 1.2 SUMMARY: This section includes requirements for traffic control, temporary detours, barricades, services, utilities and other facilities. Construction cleaning methods and waste removal are also included. This Section is intended to supplement Title 8 of the General Contract Conditions.
- 1.3 PROJECT CONDITIONS:
- A. Scheduled Uses: Provide temporary facilities and services at the time first needed at the site; and maintain, expand and modify the facilities as needed throughout the construction period. Do not remove service until it is no longer needed. At the earliest feasible time, and when acceptable to the Owner, change over from the use of temporary utility service to permanent service.
 - B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

- 2.1 MATERIALS AND EQUIPMENT:
- A. Provide either new or used materials and equipment for temporary facilities. Such materials shall be in substantially undamaged and serviceable condition. Provide types and qualities that are recognized in the construction industry as suitable for the intended use in each application.
- 2.2 TEMPORARY FENCES AND BARRICADES:
- A. General: Material may be new or used, but shall be suitable for intended purpose. Fences and barriers shall be structurally adequate and neat in appearance.
 - B. Construction Barrier Fencing at tree protection areas: Plastic orange mesh construction fence, 4' height.
 - C. Portable Chain Link Fencing: Shall be open mesh fencing, 6-ft. height, with top and bottom rails. Posts shall be spaced at max. 8-feet on center, and be equipped with cross bar bases for stability. Weigh bases down with sandbags if required. Provide with lockable gates. Portable chain link fencing shall be required around all playground equipment installations.
 - D. Barrier Tape: Banner Guard, imprinted with "CAUTION: CONSTRUCTION AREA",

manufactured by Reef Industries, Inc., Houston, Texas, or approved equal.

- 2.3 TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES: Refer to Section 01565.
- 2.4 CLEANING MATERIALS: Use only cleaning materials recommended by manufacturer of surface to be cleaned.

PART 3 – EXECUTION

3.1 TEMPORARY FACILITIES:

- A. Sanitary Facilities: Install temporary toilets in accordance with General Condition 325.
- B. Barricades, Warning Signs and Lights: Erect and maintain barricades, lights, danger signals, and warning signs in accordance with General Condition 802 and the approved traffic control plan.
 - 1. The Contractor shall take all measures necessary to provide safety for the public as part of his construction practices.
 - 2. Fence, barricade, or otherwise block off the immediate work area to prevent unauthorized entry into the work area.
 - 3. Adequately barricade and post all open cuts in the project area. Illuminate barricades and obstructions at night; keep safety lights burning from sunset to sunrise.
 - 4. Barrier Tape: Install where needed. Keep a minimum of two rolls on site at all times.
 - 5. Cover pipes, hoses, and power lines crossing sidewalks and walkways with troughs using beveled edge boards.
 - 6. Provide adequate signage to direct both vehicular and pedestrian traffic.
 - 7. Removal: Completely remove barriers no longer needed and when approved by the Owner.
- C. Enclosure Fence (Chain link fence):
 - 1. Where required or as directed by the Owner, provide temporary chain link fence to enclose partially completed areas of construction that pose a severe safety hazard to the public (e.g., playground equipment). Provide locking entrance to prevent unauthorized entrance, vandalism, theft and similar violations of security. Maintain the fence throughout the course of construction and remove only upon approval of the Owner.
 - 2. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

3.2 PROTECTIVE MEASURES:

- A. Protection of the Work: Contractor shall take all reasonable measures to protect the work in accordance with General Condition 803.

- B. Cold Weather Protection: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed.
- C. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation to remain in place, against damage to roots, trunks or branches. Do not stockpile construction materials or excavated materials within drip line. Provide temporary guards to protect trees and vegetation to be left standing. Refer to Section 02150.
- D. Environmental Protection: Conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Reference General Condition 807.

3.3 CLEANUP DURING CONSTRUCTION:

- A. Cleanup during construction shall comply with the requirements of General Condition 324.
- B. Removal of Soils:
 - 1. Remove soils that have been contaminated by construction debris, as determined by the Owner, and dispose of off site. Replace with approved clean soils, in accordance with Section 02200, using materials appropriate to the location on the site and methods specified for fills and backfills.
 - 2. Construction debris includes, but is not limited to, waste concrete, debris and waste materials; areas used for cleaning tools, washing mixers and concrete trucks and areas containing oils, solvents, and similar liquids or their residues.

END OF SECTION 01500

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and other Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY: This work consists of furnishing, constructing, installing, maintaining, and removing when required, erosion control measures during the life of the contract to prevent or minimize erosion, sedimentation, and pollution of any state waters including wetlands.
- A. In general, the Stormwater Management Plan (SWMP) covers the following operations:
1. Roadway demolition;
 2. Removal and stockpiling of materials;
 3. Utility installation, including storm, sanitary, and water distribution systems;
 4. Abandonment of existing utilities;
 5. Installation of public utilities including telephone, electric, gas, and television; and,
 6. Construction of roadways including fine grading, aggregate base course, curb and gutter, sidewalks, bike paths, paving, and landscaping.
- B. During demolition, the following will occur:
1. Placement of construction entrance and exits where called for in the plans;
 2. Placement of concrete washout where called for in the plans;
 3. Placement of stabilized staging area where called for in the plans;
 4. Silt fence will be placed where called out for in the plans, and/or as directed by the Owner; and,
- C. Each of these items will be subject to the methods shown in the SWMP. Any stockpiles will be surrounded by a silt fence. Permanent stockpiles will be seeded.
- 1.3 SUBMITTALS: As specified in Section 01300. Submit samples of posts and filter fabric.
- A. Modifications: The Contractor may submit modifications to the Contracts ESCMs (Erosion and Sediment Control Measures) in a written proposal to the Owner as least 10 days prior to beginning any construction work. The written proposal shall include the following:
1. Reasons for changing the ESCMs, as designed and provided for in the contract;
 2. Diagrams showing details and locations of all proposed changes;
 3. A list of appropriate pay items indicating new and revised quantities;
 4. Schedules for accomplishing all revised ESCM work;
 5. A description of the effects on existing permits or certifications caused by the proposed changes;
 6. A description of the effects on the cost of implementing the ESCMs, as proposed to be revised or amended.
- B. The Owner will approve or reject the written approval in writing within two weeks after the submittal date. The Owner may order additional ESCMs if the measures proposed by

the contractor prove to be or are deemed insufficient, inadequate, or otherwise ineffective. The Contractor shall be responsible for any amendments to permits or certifications required as a result of the approved changes to the ESCMs. The changes to the ESCMs shall not be reason for and extension of contract time.

1.4 PRODUCT HANDLING:

- A. Deliver erosion control materials in acceptable condition in original, unopened containers, where applicable.

1.5 SCHEDULING:

- A. At least 10 days prior to the beginning of any construction work, the Contractor shall submit for approval by the Owner a schedule of temporary and permanent ESCM work. This schedule shall specifically indicate the sequence of clearing and grubbing, earthwork operations, and construction of temporary and permanent erosion control features. The schedule shall include ESCM work for all areas within the project boundaries, including haul roads, borrow pits, storage sites, and plant sites. No work shall be started until the ESCM schedule has been approved in writing by the Owner.
- B. Once the work has started, and throughout the duration of the project, the Contractor shall update the schedule for all ESCM work on a weekly basis, and shall submit the updated schedule to the Owner. If during construction the Contractor proposed changes which would affect the Contractor's ESCM plan, the Contractor shall propose revised ESCMs to the Owner for approval in writing before implementing such changes.
- C. The Contractor shall incorporate into the project all ESCMs, as well as spill prevention and containment measures, at the earliest practicable time as outlined in the accepted schedule.

1.6 MAINTENANCE:

- A. The Contractor shall continuously maintain all ESCMs so that they perform their intended function(s) during construction and work suspensions until the project is completed and accepted.
- B. From the time seeding and mulching work begins until the date the project is declared complete, the Contractor shall keep all seeded areas in good conditions at all times. Any damage to seeded areas or to mulch materials shall be promptly repaired, or at such time and in such a time frame as directed by the Owner.
- C. If the Contractor fails to maintain the ESCMs in accordance with the Contract or as directed by the Owner, the Owner may, after 48 hours following issuance of written notice to the Contractor, proceed to maintain the ESCMs as deemed necessary. The cost thereof will be deducted from any compensation due, or which may become due, to the Contractor under this contract.
- D. Temporary ESCMs shall be removed upon completion of the project, unless otherwise directed by the Project Manager. At the completion of the project, removed temporary ESCMs and their component materials shall become the property of the Contractor.

- E. The ESCMs will be observed daily during construction by the Contractor and after each rain event. All inspection shall be documented and shall include at a minimum, the date of inspection, any incidence of non-compliance, signed certification that the site is in compliance, and any notes, drawings, maps, etc pertaining to repairs. Copies of all documentation shall be distributed to municipalities and owner on a regular basis and at a minimum of 7 day intervals. Once stabilization has occurred, the Contractor shall inspect all ESCMs every 7 days at a minimum and after significant precipitation or snowmelt events. A sample inspection report is provided in the appendix.

PART 2: PRODUCTS

2.1 SILT FENCE MATERIALS:

- A. Fabric: Shall be Amoco 2130 Silt Fence Fabric as manufactured by Amoco Fabric and Fibers Company, Atlanta, GA 30339, telephone 800-445-7732 or approved equal. Provide securing pins as recommended by fabric manufacturer.
- B. Posts: 2" x 2" wood, min. 4'-6" length as approved by the Owner.

PART 3: EXECUTION

3.1 GENERAL:

- A. Unforeseen conditions: The Contractor shall design and implement ESCMs for correcting conditions unforeseen during the design of the project, or for emergency situations that may arise during construction. ESCMs prepared and proposed by the Contractor shall be reviewed and approved by the Owner prior to installation.
- B. Work outside the project area: In areas outside the project area that are used by the Contractor and which include, but are not limited to, borrow pits, haul roads, storage sites, disposal sites, maintenance areas, batching areas, etc., ESCM work shall be performed by the Contractor at the Contractor's expense.
- C. Stabilization: The term "permanent stabilization" means to cover disturbed areas with final seed and mulch as indicated in the plans. The term "temporary stabilization" means to cover disturbed areas with seed, mulch, mulch with a tackifier, or a combination seed/mulch/tackifier, or to use a soil stabilization technique such as surface roughening. Other permanent or temporary soil stabilization techniques can be proposed, in writing, by the Contractor and used upon approval, in writing, by the Owner.
- D. Under no conditions shall the surface area of erodible earth material exposed at any one time by clearing/grubbing and/or earthwork operations exceed 34 acres, with no more than 17 acres attributable to earthwork operations. The Contractor shall permanently stabilize each 17-acre increment of the project immediately upon completion of grading within that section. Once earthwork has begun on a section, it shall be pursued until completion.
- E. The duration of exposed, uncompleted construction shall be as short as practical. Completed areas shall be permanently stabilized within seven days after completion.

Disturbed areas where work is temporarily halted shall be temporarily stabilized within seven days after the activity ceased, unless work is to be resumed within 30 days after the activity ceased.

- F. Clearing and grubbing operations shall be scheduled and performed so that grading operations and permanent stabilization measures can follow immediately thereafter if the permit conditions permit. Otherwise, temporary stabilization measures may be required between successive construction phases or stages.
 - G. Upon failure of the Contractor to coordinate the permanent stabilization measures with the grading operations in a manner which effectively controls and prevents water pollution, the Owner will suspend the Contractor's grading operations and withhold monies due to the Contractor on current and subsequent estimates until such time that all aspects of the work are coordinated in an acceptable manner.
 - H. ESCMs shall comply with the SWMP and shall be in accordance with these specifications. In the case of an apparent conflict between these two documents, the Contractor shall make a written request for clarification to the Owner. Within a period of 48 hours from receipt of the Contractor's request, the Owner will issue a written clarification.
- 3.2 SILT FENCE: Silt fence shall be installed prior to any grubbing or grading activity. Refer to details for installation directions. Refer to layout drawings for location. Owner shall approve fencing and location before final installation.
- A. Posts: Erect where indicated; space not more than 15 feet on center. Extend all posts equal distance above grade and not more than 3' in height.
 - B. Fabric: Attach to posts as approved by Owner, on uphill side of posts. Embed fabric in shallow trench as indicated.
 - C. Upon completion, posts and fabric shall be plumb. Maintain silt fence in plumb position and in good condition. Replace broken posts, ripped fabric, and re-attach broken fabric to post connections. Remove built-up silt after a storm, also inspect on a weekly basis to maintain in proper condition. Sediment shall be removed from behind the fence when it accumulates to one-half the exposed geotextile height, or when directed by the Owner.
 - D. Removal: Upon completion of the work of this contract, the silt fence shall be left in place with all caught foreign debris removed and disposed of in accordance with Section 01500. Silt fence shall be removed only after the vegetation has been established as determined by the Owner.
- 3.3 CONCRETE WASHOUT: Concrete washout shall be installed prior to any grubbing or grading activity. Refer to details for installation directions. Refer to layout drawings for location. Excavated material to be used in berms around concrete washout area. Berms shall be constructed of compacted soil. Berms shall be compacted with a minimum of two passes of a rubber-tired vehicle, such as a front-end loader or grader. The concrete washout shall be removed at the end of construction.
- 3.4 VEHICLE TRACKING CONTROL: Vehicle tracking control shall be installed prior to any grubbing or grading activity. Refer to details for installation directions. Refer to layout drawings

for location. Non-woven geotextile fabric to be installed prior to placement of aggregate. Aggregate shall be CDOT Section #703, AASHTO #3 coarse aggregate or VL riprap and shall be installed with a minimum thickness of 9". The vehicle tracking control shall be removed at the end of construction.

- 3.5 STABILIZED STAGING AREA: Stabilized staging area to be installed prior to any grubbing or grading activity. Refer to details for installation directions. Refer to layout drawings for location. Aggregate to be installed in all areas used for parking, storage, loading, or unloading. Aggregate shall be a minimum of 3" in size and shall be installed with a minimum thickness of 12". The stabilized staging area shall be removed at the end of construction.
- 3.6 SEEDING, MULCHING AND SODDING: Seeding, mulching, and sodding shall be performed in accordance with Sections 02932, 02933, and 02935.
- 3.7 CLEAN-UP:
 - A. Disposal of Sediment: Sediment removed during maintenance of ESCMs shall be used in or on embankments provided the material meets conditions of Section 02200.
 - B. Upon completion of work, remove ESCMs and associated debris and restore ground surface to match adjacent areas. Leave area in clean, acceptable condition.

END OF SECTION 01565

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to Work of this section.
- 1.2 SUMMARY: This section includes administrative and procedural requirements governing the Contractor's selection of products for use in the project.
- 1.3 DEFINITIONS: 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.
- A. 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.
 - B. 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.
 - C. 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.
 - D. 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 30 days after date of commencement of the Work, submit 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 60 days after date of commencement of the Work,

submit 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 Owner will respond in writing to Contractor within 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 Owner's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 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 Condition 406.

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.

1.6 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.

1.7 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 Owner 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 Title 406 of the General Contract Conditions.

PART 2: PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES: The Contract Documents and governing regulations govern product selection. Procedure governing product selection include the following:

- A. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
- B. Semi-proprietary Specification Requirements:
 1. Where Specifications name two or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.
 2. 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.
- C. Nonproprietary 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.

- D. 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.
- E. 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.
- F. 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.
- G. Visual Matching:
 - 1. Where Specifications require matching an established Sample, the Owner's decision will be final on whether a proposed product matches satisfactorily.
 - 2. 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.
- H. 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 Owner will select the color, pattern, and texture from the product line selected.

PART 3: EXECUTION

- 3.1 INSTALLATION OF PRODUCTS: 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.

END OF SECTION 01600

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and other Division-1 Specification sections apply to this section.
- 1.2 SUMMARY: This section includes:
- A. Administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Inspection procedures.
 - 2. Submittal of warranties, maintenance manuals, and record drawings.
 - 3. Specific requirements for individual units of work are specified in those specification sections that relate to the work.
 - B. Contractor's responsibility is to complete the project in accordance with the Contract Documents and to enforce their requirements on his employees, suppliers and Subcontractors.
- 1.3 WARRANTY REQUIREMENTS:
- A. Requirements for warranties are outlined in Title 18 of the General Contract Conditions.
- 1.4 SUBSTANTIAL COMPLETION:
- A. The procedures to be followed regarding Substantial Completion are outlined in Title 19 of the General Contract Conditions.
- 1.5 FINAL ACCEPTANCE:
- A. The procedures to be followed regarding Final Acceptance are outlined in Title 20 of the General Contract Conditions.

PART 2 - PRODUCTS (Not Applicable)PART 3 - EXECUTION

- 3.1 PREPARATION OF RECORD DOCUMENTS:
- A. General: Store record documents apart from documents used for construction and maintain documents in clean, dry, legible condition. Do not use record documents for construction purposes. Label each document "PROJECT RECORD" in one inch or larger printed letters. Make documents available at all times for inspection by the Owner.
 - B. Irrigation Record Drawings:

1. Refer to Section 02810, Irrigation System, for specific requirements concerning irrigation record drawings.

C. Record Drawings:

1. Maintain a clean, undamaged set of blue or black line prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
2. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
3. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
4. Keep Record Documents current. Update at least weekly. Do not permanently conceal any work, until required information has been recorded.
5. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
6. Horizontal and vertical locations of underground irrigation and electrical sleeving, referenced to permanent surface improvements. Provide the locations of both ends identified with stakes in the field. Information to be furnished on a reproducible mylar drawing with a field log of all survey data.
7. Location of clean-outs and other items requiring access or maintenance.
8. At the completion of the project, supply a digital computer file of the record drawings and one hard copy to the Owner. The Owner will supply the contractor with a file of the drawings prior to beginning work.

END OF SECTION 01700

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division-1 Specification sections apply to Work of this Section.
- 1.2 SUMMARY:
- A. Work Includes: Demolition and removal asphalt walks, irrigation equipment, concrete slabs, backstop and fencing, vehicle barrier, and miscellaneous site furnishings. The work also includes incidental filling and grading, and disposal of unsalvageable materials.
 - B. Related Work:
 - 1. Construction Facilities and Temporary Controls – Section 01500
 - 2. Tree Protection and Retention - Section 02150
 - 3. Earthwork - Section 02200
- 1.3 QUALITY ASSURANCE: Comply with safety requirements for demolition, ANSI A10.6-83. Erect suitable barriers around open excavations. No blasting or burning will be permitted.
- 1.4 PROJECT CONDITIONS:
- A. Keep dust to a minimum at removal areas. Use sprinklers or water trucks as necessary.
 - B. Ensure safety of persons in demolition area. Provide temporary barricades as required per Section 01500.

PART 2: PRODUCTS

- 2.1 FILL MATERIALS: Native soils, free of debris, frozen materials, and roots and other organic matter. See Section 02200.

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 Sections 01500 and 02150, prior to proceeding with any demolition.
- 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 neatly sawcut along an existing joint. Jagged or crooked edges will not be acceptable. Haul concrete material off site.

2. Remove asphalt paved roads, parking lots, walks, curbs and miscellaneous asphalt as indicated. Cuts between pavement to be removed and pavement to remain shall be sawcut straight, smooth and clean with no jagged edges. Asphalt shall be broken up and hauled off site.
3. Remove road base material that is exposed after removing the pavement. This material shall be hauled from the site unless otherwise directed 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 within 24 inches of excavation or final grade. Cap off conduits with minimum 24-inch long concrete plugs.

3.3 RESTORATION:

- A. Backfilling: Ensure that areas to be filled are free of standing water, frost, frozen material, and debris. Place fill materials in accordance with Section 02200.
- B. Grading:
 1. Restored Areas: Grade surface to blend with original contours and provide free drainage flow. All ruts and depressions shall be regraded to a smooth natural appearance.
 2. New Construction Areas: Grade as indicated in Section 02200.

3.4 DISPOSAL:

- A. Remove trash, debris and waste materials, and legally dispose of it off the property.
- B. Salvaged Material: All salvaged material remains the property of the City. Store where directed by the Project Manager.

END OF SECTION 02050

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division-1 Specifications apply to Work of this Section.
- 1.2 SUMMARY:
 - A. Work Includes: Stripping sod, and removing and disposing of vegetation and debris.
 - B. Related Work:
 - 1. Tree Retention and Protection - Section 02150
 - 2. Erosion and Sediment Control - Section 01565
- 1.3 DEFINITIONS:
 - A. The term “stripping sod” shall be used when the vegetative material to be removed is mowable and generally less than 12” tall.
 - B. The term “tree removal” refers to individual woody plants with a caliper over 4”.
 - C. The term “clearing and grubbing” refers to all other plant removals.

PART 2: PRODUCTS

- 2.1 BACKFILL MATERIAL: On-site soils, unless otherwise specified.

PART 3: EXECUTION

- 3.1 PROTECTION OF TREES AND PLANTS TO REMAIN: Locate and suitably identify trees and improvements indicated to remain. See Section 02150.
- 3.2 CLEARING: Remove brush and vegetation from areas designated to be cleared. As directed by the Owner, trim low hanging, unsound, or unsightly branches on trees and shrubs designated to remain. Make cuts flush with trunk or branch.
- 3.3 GRUBBING: Remove all stumps, roots, and debris a minimum of 18 inches 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.
- 3.4 SOD STRIPPING: Strip sod in all areas to be regraded, such that a relatively clean dirt surface remains.
- 3.5 TREE REMOVAL: In all proposed landscaped areas, trees under 12” caliper shall be grubbed a minimum of 18 inches below finish grade; the stumps of trees 12” caliper and over shall be ground down a minimum of 6” below finish grade. In proposed hardscape areas, all roots shall be grubbed entirely.

- 3.6 DISPOSAL: Dispose of all removed materials, trash, debris and waste materials legally outside of the Owner's property.

END OF SECTION 02110

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY: The work of this section consists of retention and protection of trees during the construction of the project.
- 1.3 GENERAL REQUIREMENTS:
- A. There should be daily supervision of field crews by the Owner during the critical phases of the project: for example, demolition of existing concrete; root pruning; construction of retaining walls and construction of new curb or sidewalk in tree protection areas. Owner may require a consulting arborist be hired to oversee the project.
 - B. If it appears that the completion of the construction may cause damage to the branches of any tree, the Contractor shall contact the Owner. The Owner will make a determination as to whether such damage is eminent.
 - C. To prevent or minimize soil compaction, designated routes for equipment and foot traffic by work crews shall be determined prior to commencing construction activities, and shall be indicated in the tree protection plan to be submitted by Contractor. These routes shall be marked at the site, prior to commencement of construction, with tree protection fencing and signage as specified in Paragraphs 3.6 and 3.7 of this section. A Tree Protection Plan shall be submitted and approved.
 - D. Motorized equipment and trailers, including tractors, bobcats, bulldozers, trackhoes, trucks, cars, and carts shall not be allowed access within tree protection areas. Should access be necessary within designated tree protection areas, the existing grade shall be covered with six (6) to eight (8) inches of wood mulch to help distribute the weight of equipment and to minimize soil compaction and rutting. Plywood and/or mulch is not acceptable bridging material for driving over exposed tree roots. Exposed tree roots shall not be driven over. The Owner shall be notified and shall approve of the access and driving surface prior to its use.
 - E. Materials and supplies shall not be stockpiled or stored within the tree protection area. Should temporary storage be necessary within designated tree protection areas, the existing grade shall be covered with double, overlapping sheets of $\frac{3}{4}$ inch thick plywood, or six (6) to eight (8) inches of wood mulch to help distribute the weight of materials or supplies and to minimize soil compaction.
 - F. Under no circumstances shall any objects or materials be leaned against or supported by a tree's trunk, branches, or exposed roots. The attachment or installation to trees of any sign, cable, wire, nail, swing, or any other material that is not needed to help support the natural structure of the tree is prohibited. Standard arboricultural techniques such as bracing or cabling that are performed by professional arborists are acceptable upon approval by the Owner.
 - G. Appropriate tree pruning and/or removal permits must be secured prior to beginning

work.

1.4 DEFINITIONS:

- A. **TREE PROTECTION AREA:** Generally, a tree protection area should consist of the ground encompassing from 1.5 (minimum) to 2.0 times the distance between the trunk and dripline, or one linear foot away from the trunk base for every inch diameter of the trunk, whichever is greater. (See section below). Areas of ground covered by pavement, buildings, or other permanent structures where the presence of roots is minimal or negligible, are excluded. The area under or within the tree's dripline is also referred to as the "Critical Root Zone" (see below).
1. With groups of trees or where an array effect is present, there may be discontinuous (non-overlapping) perimeters of tree protection areas, which result in difficult to maintain or ineffective tree protection fencing. In these cases, even though tree protection areas do not overlap, they should be treated as though they do if the distance between the perimeters of such areas is less than thirty (30) feet. In effect, this will artificially enlarge the area of tree protection, but will result in a more clearly defined, manageable area.
- B. **DRIPLINE:** The outermost edge of the tree's canopy or branch spread. The area within a tree's dripline is all the ground under the total branch spread.
- C. **CRITICAL ROOT ZONE:** Generally, all of the ground area included in the dripline.
- D. **DIAMETER (CALIPER):** The size (in inches) of a tree's trunk is measured at:
1. six (6) inches above grade for trunk diameters up to and including four (4) inches;
 2. twelve (12) inches above grade for trunk diameters from four (4) inches up to and including eight (8) inches; and
 3. four and a half (4½) feet above grade for trunk diameters greater than eight (8) inches; in accordance with guidelines established in the "Guide for Plant Appraisal". All measurements should be rounded to the nearest inch.
- E. **HIGH-VALUE SHRUB:** Any specimen shrub with an appraised value of \$100.00 or more.
- F. **PROJECT CONSULTING ARBORIST:** An independent consultant with a degree in a field related to arboriculture, and at least five years field experience in tree preservation or on-site monitoring of public works or construction projects involving tree retention and protection. The Consultant should be an active member in the American Society of Consulting Arborists and International Society of Arboriculture.

1.5 REFERENCE STANDARDS AND GUIDELINES:

- A. Contractor shall comply with applicable requirements and recommendations of the most current versions of the following standards and guidelines. Where these conflict with other specified requirements, the more restrictive requirements shall govern.
1. ANSI Z133.1-1988: American National Standard for Tree Care Operations

2. ANSI A300-1994: Standard Practices for Trees, Shrubs and Other Woody Plant Materials
3. NATIONAL ARBORIST ASSOCIATION STANDARDS: Pruning, Cabling and Bracing, Fertilization
4. GUIDE FOR PLANT APPRAISAL-8TH EDITION: Authored by the Council of Tree and Landscape Appraisers; published by the International Society of Arboriculture

PART 2: PRODUCTS - Not applicable

PART 3: EXECUTION

- 3.1 **CONSTRUCTION REQUIREMENTS**: This section provides standards and guidelines for the retention and protection of trees and high-value shrubs for any proposed public works or construction project.
- 3.2 **DEMOLITION OF EXISTING CONCRETE**: Caution should be used during removal of existing street, curb, gutter, sidewalk, drain inlets, and other concrete and asphalt demolition, to minimize injury to tree root systems. The following procedures should be used when removing existing concrete.
 - A. Breaking of the existing concrete and asphalt for removal should be done in a manner that will minimize ground disturbance and vibration.
 - B. Curbs and sidewalks within designated tree protection areas and critical root zones shall be removed by hand. When removing existing sidewalks and curbs, care should be taken to avoid injury to roots located under, over, or adjacent to paved surfaces.
 - C. Roots and root-trunk flares growing over curbs should not be injured during breaking of curbs and removal of debris. Wood and bark tissues shall not be injured by striking tissues with equipment.
 - D. During the removal of concrete, all root systems and soil areas exposed shall not be disturbed.
 - E. Motorized equipment and trailers, including tractors, Bobcats, bulldozers, trackhoes, trucks, cars, and carts are to be limited to access on the existing paved street only. Access is not allowed behind the curb within tree protection areas.
 - F. Should access be necessary within designated tree protection areas, the existing grade shall be covered with double, overlapping sheets of $\frac{3}{4}$ inch thick plywood, or six (6) to eight (8) inches of wood mulch to help distribute the weight of equipment and to minimize soil compaction and rutting. Plywood and/or mulch is not acceptable bridging material for driving over exposed tree roots. Exposed tree roots shall not be driven over. The Owner shall be notified and shall approve of the access and driving surface prior to its use.
- 3.3 **CONSTRUCTION OF SIDEWALKS, CURBS, CONCRETE, ASPHALT PAVING AND DRAINAGE INLETS**: The following procedures shall be used when constructing sidewalks,

curbs, concrete, asphalt paving, and drainage inlets.

- A. Keep all materials and equipment within the street bounded by existing curbs.
- B. Protect exposed roots from contamination by stabilization materials and concrete.
- C. Locate concrete washout areas away from roots and tree protection areas.
- D. When excavating for the construction of inlets, excavated soil shall be deposited in trucks and hauled off or deposited temporarily on $\frac{3}{4}$ inch thick plywood outside the critical root zone. Excavated and fill soil shall not be deposited, even temporarily, on unprotected natural grade.
- E. After proper pruning, as needed, cover exposed roots within thirty (30) minutes to minimize desiccation. Roots may be covered with soil, mulch, or moistened burlap (7 ounce or equivalent), and shall be kept moist during the period until the final grade is established.
- F. Where possible, sidewalks should be raised, narrowed, curbed, or relocated to prevent cutting and removing major roots (e.g. roots greater than three inches in diameter).
- G. Place a sheet of six (6) mil or thicker plastic over the grade within affected portions of tree protection areas prior to pouring concrete sidewalks, curbs, inlets, ramps, and driveway approaches. The plastic will assist in providing a non-leaching barrier between the concrete, soil and roots.
- H. Construct new sidewalks on, or above, the existing grade instead of excavating into root zones. The new grade shall not interfere with sheet-flow drainage.
- I. Limit grading to a maximum of two (2) inches of fill over natural grade within critical root zones. Fill should consist of sandy loam topsoil. Clay soils shall not be used as fill. When using fill soil, the existing surface to receive fill should be scarified prior to filling. Any filling operation should not occur during water saturated soil conditions.
- J. Existing soil may be used as a form for back of curb and gutter, with or without the use of a thin masonite-type form, although a masonite form is preferred. This will minimize excavation in the critical root zone and prevent undue injury to the roots. This method is unnecessary in areas outside the critical root zone. Place a layer of Typar BioBarrier between the curb and tree roots to help inhibit root growth that may exploit small cracks in the curb. Where appropriate, use curbs with discontinuous footings to maintain natural grade near the base of trees adjacent to the curbing, and to minimize injury to roots and root flares.
- K. Provide for easy concrete removal and replacement where an obvious raised root may cause sidewalk cracking in the future. This can be accomplished by installing an expansion joint on either side of the root or by etching the concrete on either side of the root to allow that particular section to be broken out and replaced. Compaction rating for the replacement walkway should not exceed 80% Proctor density. Tree roots will continue to slowly add girth every year; therefore, the base material needs to be malleable (e.g. suitable subgrade aggregates, crushed granite, or compacted sand) to prevent a fulcrum or pressure point which can crack or heave the walkway.

- L. Where appropriate, and under the direction of the Owner, root restricting barriers can be installed with a minimal amount of disturbance. There are several promising landscape related materials used as barriers to root growth, especially away from sidewalks, curbs and streets. Three such materials are:
1. a stiff nylon woven fabric (Q899 nylon fabric with extra firm finish from Jason Mills, Westwood, NJ);
 2. 14-mesh or smaller copper wire screen; and
 3. Typar BioBarrier (REEMAY, Inc., Old Hickory, TN). The nylon fabric has holes approximately 1/26th-inch square separated by strands approximately 1/26th-inch thick, with strands fused together. Copper screen has been shown to be effective in controlling seedling root growth. Typar BioBarrier is a commercial product developed specifically to control roots of trees, and consists of a felt-like spun-bounded polypropylene fabric to which polyethylene pellets are attached at one and a half (1½) by one and a half (1½) inch spacing. The pellets are impregnated with the herbicide Trifluralin and release it slowly over time (many years). After a two (2) foot deep, narrow trench is dug adjacent to the curb, sidewalk, or other structure involved, and after any affected roots are properly pruned, the material of choice should be placed against the side of the wall closest to the roots that were severed (side of the wall farthest from the structure being protected). Note: This procedure should not be used if large, existing roots (four (4) inches or larger in diameter) will be severed. The nylon fabric and copper screen will constrict roots to the size of the openings in the material; beyond the constrictions, roots will be greatly stunted except for knobs that form against the barriers. The barrier should be installed at least eighteen (18) to twenty-four (24) inches deep (in a vertical plane).
- M. In areas where roots have to be removed for construction of drain inlets, roots shall be severed prior to excavation to eliminate unnecessary tearing of roots by equipment.
1. Excavate soil by hand at the construction cut limit to a depth of thirty (30) inches or to the depth of the required root cut, whichever is less.
 2. Prune roots as specified in Paragraph 3.5 of this section.
 3. Protect exposed roots as specified in Subparagraph 3.3E of this section.
- N. Concrete or chemicals spilled within tree protection areas should be completely removed. Contamination soil shall be completely removed at the time of the spill and removed by hand without disturbance to root systems. Appropriate soil should be added as necessary to restore the grade.

3.4 IRRIGATION OR UTILITY INSTALLATION:

- A. PROTECTION OF TREES AND HIGH-VALUE SHRUBS: Contractor shall protect all trees and high-value shrubs from injury due to irrigation related work. All injuries to trees and high-value shrubs shall be mitigated to the satisfaction of the Owner, and, if appropriate in accordance with guidelines established in the "Guide for Plant Appraisal". All costs of such mitigating shall be charged to and paid by the Contractor. See Paragraph 3.9 of this section for definition of high value.
1. All irrigation lines shall be indicated on construction plans and pre-approved by the Owner. Unless absolutely necessary, no irrigation lines shall be located within 10 feet of any existing tree trunk. (See following paragraphs).

- B. EXISTING TREES: The Owner shall be notified prior to any trenching or excavation known or suspected to involve cutting of more than:
 - 1. two roots, three inches or more in diameter; and/or
 - 2. four roots between two (2) and three (3) inches in diameter. The Owner shall be notified immediately in the event that roots in excess of that described above are cut, torn, ripped, or otherwise injured.
- C. All trenching or other work under the dripline of any tree shall be done by hand or by other methods which will prevent breakage or other injury to branches and roots.
- D. Where it is necessary to excavate within the critical root zone of existing trees, contractor shall use all possible care to avoid injury to trees and tree roots. Excavation, in areas where two (2) inch diameter and larger roots occur, shall be done by hand with approved hand tools. Where possible, tree roots two (2) inches or larger in diameter shall be tunneled or bored under and shall be covered with moistened burlap to prevent excessive drying.
- E. Wherever a trenching machine exposes roots smaller than two (2) inches in diameter, such roots extending through the trench wall shall be hand pruned (see Paragraph 3.5 of this section). All trenches within critical root zones shall be closed within twelve (12) hours-if this is not possible, the trench walls shall be covered with burlap and kept moistened. Prior to backfilling, Contractor shall contact the Owner to inspect the condition and treatment of roots larger than two (2) inches in diameter injured by trenching.
- F. Horizontal directional boring (auger tunneling), rather than open trenching, should be used for irrigation line or other utility installation within one half (½) foot linear distance from the trunk base for every inch of trunk diameter, if root disruption or utility installation occurs on no more than one side of the tree. If trenching or utility installation will occur on two or more sides of a tree trunk (e.g. N,S,E, or W), then horizontal directional boring should be used if line installation is within one (1) foot linear distance from the trunk base for every inch of trunk diameter.

3.5 ROOT PRUNING:

- A. Tree roots shall not be pruned or cut unless their removal is unavoidable or absolutely necessary. The Owner shall be notified prior to any operation known or suspected to involve cutting of more than:
 - 1. two roots, three (3) inches or more in diameter; and/or
 - 2. four (4) roots between two (2) and three (3) inches in diameter. The Owner shall be notified immediately in the event that roots in excess of that described above are cut, torn, ripped, or otherwise injured.
- B. Upon approval by the Owner, prior to any excavation, removal of sidewalk, or other activity that will result in removal of soil and tree roots, all tree roots within a designated area will be pruned to a depth of fourteen (14) inches. Pruning shall occur with a Dosko Root Pruner, or equivalent, in accessible areas, and by hand in areas inaccessible to the root pruning machine. All other root pruning shall be done by hand with approved tools.

- C. Removal of roots greater than one (1) inch diameter or parts of roots that are injured or diseased should be performed as follows:
1. Preserve the root bark ridge (similar in structure and function to a branch bark ridge). Directional root pruning is the recommendation technique and should be used during hand excavation around tree roots. Roots are similar to branches in their response to pruning practices. With directional root pruning, objectionable and severely injured roots are properly cut to a lateral root, if possible, that is growing downward or in a favorable direction.
 2. All roots needing to be pruned or removed shall be cut cleanly with sharp hand tools, with oversight by the Owner. No wound dressings shall be used.
 3. Recommended root pruning tools:
 - a. Scissor-type lopper.
 - b. Scissor-type pruner.
 - c. Large and small hand saws.
 - d. Wound scriber.
 - e. Trowel or small shovel.
 - f. Garden Fork.
 - g. Hand broom.
- D. Root Pruning Near Sidewalks
1. Root pruning should be done carefully, by hand, to achieve the objective of reducing future sidewalk problems as well as preserving the trees. Removing anchoring roots or causing injuries in anchoring roots and root flares can cause future decay and windthrow hazards. Indiscriminate cutting of vigorous roots results in their resprouting so that several more new roots may grow from the cut end, back under the sidewalk, thereby reducing the time between sidewalk repairs. Roots can be managed in the ground without significant harm to trees, if care is taken to avoid injuries that lead to root and trunk decay.
 2. Directional root pruning is recommended because it considers the tree's response to root pruning and decay. With directional root pruning, roots are cut to a large lateral, if possible, that is growing downward or in a more favorable direction. The pruned root ends will be less likely to resprout, since a large lateral can assume the new terminal role of the root.
 3. Proper removal of selected roots or parts of roots can direct roots away from sidewalks in the future. Procedures for root pruning directly next to sidewalks are as follows:
 - a. Hand dig a trench six (6) to eight (8) inches in depth at the edge of the planting strip and sidewalk.
 - b. Remove all roots less than two (2) inches diameter in this trench back to a desirable lateral root, preserving the root bark ridge. If careful excavation does not reveal a desirable lateral root within twelve (12) inches of the exposed root in question, then the exposed root shall be pruned properly so that a minimal amount of root is removed.
 - c. Small root bundles, the source of future sidewalk problems, should also be removed at this time.
- E. All roots between two (2) and four (4) inches in diameter should be examined by the Owner in terms of their role in anchoring the tree.

1. All roots that contribute significantly to anchorage should be preserved. Remove all other roots in this size range to sound, downward growing lateral roots that are at least one half (½) the size of the root being removed.
 2. All roots larger than four (4) inches in diameter are to be preserved unless their removal is absolutely necessary. Preservation of large roots may require:
 - a. reducing the sidewalk width near the root flare; and/or
 - b. ramping or bridging the sidewalk over the roots to allow for root growth.
- F. Tree guying subsequent to root pruning: Upon review of on-site root pruning and constructing grading limits, the Owner shall determine if existing trees subject to root pruning should be guyed or otherwise stabilized. Contractor shall retain a qualified tree service company to complete tree guying and stabilization in accordance with National Arborist Association standards as referenced in Section 5.00. Tree service company shall be licensed by the City and County of Denver.

3.6 TREE PROTECTION FENCING:

- A. Tree protection fencing should be installed two (2) feet behind the existing curb in areas where the street surface will be removed and replaced. Tree protection areas shall be designated on construction documents, and fencing locations should be staked for approval by the Construction Manager and Owner.
- B. Tree protection fences should be constructed of one of the following:
 1. Galvanized chain-link - six (6) feet in height. Posts should be installed on ten (10) foot centers (maximum), at a depth of three (3) feet minimum. Installation of post shall not result in injury to surface roots or root flares of trees.
 2. Colored (orange), molded plastic construction fencing-four (4) feet in height.
- C. Fencing should be installed to completely surround the limits of tree protection areas, and should extend at least ten (10) feet beyond the designated construction limits.
- D. Tree protection fencing shall be installed prior to any site activity and shall remain until its removal is authorized by the Owner.

3.7 TREE PROTECTION SIGNAGE: A standard Denver Forestry Tree Protection sign shall be mounted on tree protection fencing at fifty (50) foot intervals warning constructing personnel and the public to keep out of the tree protection areas. Signs may be picked up at Denver Forestry Office.

3.8 PROJECT SITE MONITORING: As determined by the Owner for projects of sufficient size to warrant such, a Project Consulting Arborist shall be retained to enforce and monitor the Tree Retention and Protection objectives. The project site should be monitored a minimum of two (2) times weekly-more frequently at the start of the project until all procedures and specifications are understood and properly executed by all parties. Specific monitoring schedules should be developed at preconstruction meetings and modified as deemed necessary by the appropriate parties. Schedules shall be relayed to the Owner along with reports of site visits.

3.9 INJURIES TO EXISTING PLANTS - DAMAGE PENALTIES:

- A. Tree and High-Value Shrub Appraisal: All trees and high-value shrubs will be evaluated and appraised by the Owner, and a list of all tree values for the project will be on file in the Construction Manager's office. Any tree or other plant requiring retention or protection that is not on the list shall be appraised by the Owner as necessary to comply with this damage penalty.
- B. Documentation for appraisals will consist of :
 - 1. measurement of plant size;
 - 2. identification by common and botanical names;
 - 3. current condition (overall health, injuries, overt hazard status, etc.) and
 - 4. location factors as described in the "Guide for Plant Appraisal". Photographs may be taken of certain trees and shrubs to document debilitating condition factors.
- C. The threshold level for plants to be appraised shall be \$100.00; only those trees and shrubs estimated to have a monetary value greater than \$100.00 shall be appraised.
- D. Trees and other plants designated as requiring retention or protection shall be identified and located on construction plans. Loss of, or partial injury to, any of these plants due to Contractor neglect or improper construction activities will result in a penalty of up to treble damages of the assessed value of the tree as determined by the Owner as described in Chapter 57 of Denver Revised Municipal Code.
- E. Trees determined as requiring "general protection" or "special protection" in the construction areas and in other key locations should be clearly identified by the Owner. Loss or partial injury to any of these trees due to Contractor neglect or improper construction activities will result in a penalty of up to treble damages for the assessed value of the trees as determined by the Owner as described in Chapter 57 of Denver Revised Municipal Code. Injury to a portion of these trees will be assessed by the Owner and a corresponding portion of the liquidated damages will be assessed to the Contractor.
- F. A fine of one-thousand dollars (\$1,000.00) will be levied against the Contractor for each incident of construction damage (including construction traffic) within designated tree protection areas. Any fine shall be independent of any applicable damages for the assessed value of the tree or tree part.
- G. Trees or roots visibly and unnecessarily injured will cause the Owner to withhold from the Contractor an assessed amount conforming to the requirements stipulated above, for a period of one full year. After that period the impact of the injury to any tree will be assessed by the Owner.

3.10 SUBMITTALS:

- A. Proposed methods and schedule for effectuating tree and other plant protection shall be submitted for approval. Contractor shall submit construction schedule which includes a time frame for work near existing plants. Approval of such shall be obtained from the Owner prior to commencement of construction near tree protection areas.
- B. Proposed methods, materials, and schedule for root pruning, branch pruning, and other tree maintenance shall be submitted for approval. The Owner shall mark the location of

root pruning lines in the field prior to the operation. If possible, root pruning should occur between autumnal leaf fall and spring foliage. Root pruning during the growing season shall require approval of the Owner.

3.11 TREE AND OTHER PLANT MAINTENANCE DURING AND AFTER COMPLETION OF CONSTRUCTION.

- A. Proper maintenance should include, but without limitation to: structural and remedial pruning; watering; mulching; remediating soil compaction; fertilization; insect and disease control; soil and tissue analysis; aeration; and wound treatment.
- B. The timing duration and frequency of necessary maintenance practices should be determined by the Owner based on factors associated with the site and affected plants.

END OF SECTION 02150

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division - 1 Specification Sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Provide excavation, regrading, stripping and stockpiling of topsoil, filling, backfilling, compaction, hauling, and legal off-site disposal of spoil materials to meet the required lines and grade as specified to complete the work.
 - B. Related Work:
 - 1. Erosion and Sedimentation Control – Section 01565
 - 2. Removals - Section 02050.
 - 3. Clearing and Grubbing – Section 02110.
 - 4. Native Seeding – Section 02932.
 - 5. Sodding – Section 02935.
- 1.3 DEFINITIONS:
- A. Excavation consists of removal of material encountered to subgrade or over-excavation and subsequent disposal or placement of materials removed.
 - B. All excavation will be considered unclassified regardless of the nature of material encountered.
 - C. Unauthorized excavation consists of inadvertent or purposely removing materials beyond indicated subgrade elevations or dimensions without specific direction of the Owner. Unauthorized excavation, as well as remedial work resulting from unauthorized excavation shall be at Contractor's expense.
 - 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.
 - E. Subgrade: The undisturbed earth or the compacted soil layer immediately below proposed pavement topping materials.
 - F. Structure: Walls, foundations, slabs, pavement or other man-made stationary features occurring above or below ground surface.
 - G. Structural Fill: The term "structural fill", as used herein, includes soil materials used for general site filling under pavements or structures.
 - H. 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.

1.4 QUALITY ASSURANCE:

- A. 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 requirements.
- B. Testing Agency: All testing required to determine compliance for the work of this section will be done by the a testing agency and as specified in Section 01400. Correct deficiencies before placing additional embankment.
- C. Referenced Standards: Comply with the requirements of the reference standards noted herein, except where more stringent requirements are listed herein or otherwise required by the Contract Documents, to include specifications of local agencies exercising jurisdiction over this project.

1.5 PROJECT CONDITIONS:

- A. Existing Utilities: The Contractor shall contact all public utility companies and determine the location of all existing underground utilities prior to proceeding with construction. All work performed in the area of public utilities shall be performed according to the requirements of these agencies. The Contractor shall be responsible for locating any existing utility (including depth) which may conflict with the proposed construction. The Contractor shall contact Utility Notification Center of Colorado (800) 922-1987 and other local utilities for existing utility locations. The Contractor shall protect, at his own expense, all existing utilities and be responsible for their repair if they are damaged during construction.
- B. Use of Explosives: Use of explosives is not permitted.
- C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
 - 1. Operate warning lights as recommended by authorities having jurisdiction.
 - 2. 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.

1.6 SUBMITTALS:

- A. Provide one (1) cubic foot sample of backfill material for approval by Owner.

- B. Material classifications for soils, test reports and density requirements.

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 3 inches. Owner to approve material prior to placement.
- B. Structural Fill: Existing soils obtained from on-site excavations, including granular or aggregate base course from removed pavements shall be free of organic matter or any other deleterious substances. 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 Soils Engineer will evaluate the suitability of proposed fill material prior to placement.
- C. On-Site Topsoil: The top 4" +/- of organic material in existing lawn areas, to be stripped and stockpiled prior to other earthwork operations.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Verification of Conditions: Examine areas and conditions under which the work of this Section will be performed. Do not proceed with the work until unsatisfactory conditions have been corrected. Commencement of work implies acceptance of all areas and conditions.

3.2 GENERAL PROCEDURES:

- A. Existing Utilities: Locate existing underground utilities in areas of the work. If utilities are to remain in-place, provide protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult Owner immediately for direction. Cooperate with utility companies in keeping respective permanent and temporary utility services and facilities in operation. Repair damaged utilities to the satisfaction of the appropriate utility company.
- B. Protect of Persons and Property: Provide all necessary measures to protect workmen and passersby. Barricade open excavations occurring as part of the work, as required by municipal or other authorities having jurisdiction.
- C. 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. 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 after continual monitoring by Owner.

3.3 GROUND SURFACE PREPARATION:

- A. Complete clearing and grubbing operations in accordance with Section 02110. 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 asphalt or concrete pavement, the entire subgrade shall be scarified to a depth of 8 inches. Adjust moisture content and compact as hereinafter specified.

3.4 STRIPPING AND STOCKPILING TOPSOIL:

- A. Strip all topsoil from the excavation zone for new facilities (4" depth for all disturbed areas). Stockpile topsoil in locations indicated on the Drawings or as directed by the Owner.

3.5 EXCAVATION:

- A. All excavation shall be considered unclassified, including excavation to subgrade or trench elevations as indicated, regardless of character of materials and obstructions encountered.
- B. Stability of excavations: Comply with local codes, ordinances, and requirements of agencies having jurisdiction to include the latest revision to OSHA standards.
- C. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.1 foot, and extending a sufficient distance to permit installation of services and other construction, and for inspection.
- D. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as indicated within a tolerance of plus or minus 0.1 foot.

3.6 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.

3.7 SPECIAL CONDITIONS:

- A. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric

temperature is less than 35 degrees 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 Owner immediately upon finding subsurface or other conditions which are not shown or which cannot be reasonably assumed from existing surveys. Secure Owner'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, notify the City's 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.

3.8 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.

3.9 PLACEMENT AND COMPACTION:

- A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
 - 1. When existing ground surface after vibratory process has a density less than required compaction for a particular area classification, break up ground surface. Scarify existing subgrade to depth of 6 inches prior to compacting and placing fill.
 - 2. Adjust moisture condition to Soils Engineer's recommendations regarding optimum moisture content, and recompact to the densities specified in Paragraph 3.09J.
- B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers, each layer to be compacted to meet requirements herein.
- C. 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.

D. 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 8 inches and the compacted lift thickness does not exceed 6 inches.
2. Compaction shall be obtained by the use of sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other equipment approved by the Owner. Granular fill shall be compacted using vibratory equipment or other equipment approved by the Owner. 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.

E. 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, but not too dense for planting, and there is not appreciable amount of loose soils on the slopes. Permanent fill slopes shall not exceed 4:1 (horizontal to vertical).
2. Where natural slopes are steeper than 20 percent in grade and the placement of fill is required, cut benches shall be provided at the rate of one bench for each 5 feet in height (minimum of two benches). Benches shall be at least 10 feet in width. Larger bench widths may be required by the Owner. Fill shall be placed on completed benches as outlined within this specification.

F. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Prevent wedging action of backfill against structures by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

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, in the opinion of the Owner, it is not possible to obtain uniform moisture content by adding water on the fill surface. The Contractor may be required to rake 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 approved by the Owner, 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. Prior to placement of any base or surfacing materials, 100% of the subgrade shall be proof rolled with a fully loaded tandem-axle truck.
 - J. Density Tests: Field density tests shall be made by the Contractor at locations and depths selected by the Owner. 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 Soils Engineer and approved by the Owner. On-site or imported clay materials shall be compacted to at least 95 percent of maximum standard Proctor dry density (ASTM D 698) at moisture content within 2 percent of optimum. Granular material, whether imported or developed on-site, shall be moisture conditioned to within 2 percent of optimum and compacted to at least 95 percent of maximum modified Proctor dry density (ASTM D 1557).
 2. Under landscape areas (top 12"): 85 percent of maximum standard Proctor dry density at moisture content within 2 percent of optimum (ASTM D 698).

3.10 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 0.10 foot 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 0.02 feet 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.

3.11 PLACING STOCKPILED TOPSOIL:

- A. Refer to Section 02925.

3.12 MAINTENANCE:

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.
- C. 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.
- D. 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.

3.13 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, and debris, and legally dispose of it off City's property at Contractor's expense.
- B. Remove any excess fill material from the site, unless otherwise directed by the Owner.

END OF SECTION 02200

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Includes: Constructing concrete flatwork, including walks, curbs and gutters, ramps, and pans.
 - B. Related Work:
 - 1. Cast In Place Concrete – Section 03300
- 1.3 SUBMITTALS: As specified in Section 01300.
- A. In compliance with Paragraph 5.3.2 of ASTM C94, furnish statement of composition of concrete mix and ad mixtures and evidence that mix meets specified quality.
 - B. Test reports as indicated below.
- 1.4 QUALITY ASSURANCE
- A. All concrete for flatwork shall be Class P using $\frac{3}{4}$ " maximum size aggregate (4200 PSI) unless otherwise requested by the Owner. Concrete shall be tested by a testing agency as specified in Section 01400. Contractor shall contact the agency to arrange for testing at least 48 hours prior to each pour.
 - B. Sample Panel: If requested by the Owner, prior to starting any concrete paving, provide a sample panel using materials indicated for project work. Build panel at the site of full thickness and approximately 10 feet by 10 feet, including expansion joints, control joint, scales, fillers, etc. Provide the workmanship proposed for the work. Correct and replace sample panel until Owner's acceptance of the work. Retain panel during construction as a standard for completed paving work.
 - C. The approved sample panel may be a portion of the work and remain in place. Locations as directed by the Owner.
- 1.5 PROJECT CONDITIONS:
- A. Place concrete only when ambient air temperatures are above 45 degrees F and rising, unless it is protected from freezing. Do not place concrete on frozen ground. Refer to Section 03300 for hot weather and cold weather placement procedures.

PART 2: PRODUCTS

- 2.1 SUBGRADE MATERIAL: Dense, readily compactable material, free from vegetable matter and

lumps of clay. Material excavated from on-site that meets this requirement may be used if approved.

2.2 CONCRETE:

- A. Materials: Materials, including cement, aggregates, water, and admixtures, shall meet the requirements of ASTM C94. Refer to Section 03300 for additional requirements.
 - 1. Cement: Type II, complying with ASTM C 150.
 - 2. Coarse Aggregate: Maximum size 3/4 inch, complying with ASTM C33.
 - 3. Fly Ash: Shall be Type C or F, in compliance with CDOT 701.02. (20% content by volume)
 - 4. Water: Potable
 - 5. Air Entraining Admixture: ASTM C260. No chlorides will be permitted.
 - 6. Water Reducing Admixture: ASTM C494 Type A. Provide for all flatwork. No chlorides will be permitted.
- B. Quality of Concrete: Concrete shall be furnished under Option C, ASTM C94, whereby the manufacturer assumes full responsibility for the selection of the proportions for the concrete mixture. Submit statement of composition as called for in Part 1 of this section.
- C. Total Average Air Content: 5 to 7 percent.
- D. Minimum Cement Content: 6 sacks per cubic yard.
- E. Water Cement Ratio: Max. (.45 ±).
- F. Slump: Maximum 4 inches.
- G. Compressive Strength: 4,200 PSI minimum at twenty-eight days.
- H. Manufacture and Delivery: Measurement of materials, batching, mixing, transporting, and delivery shall be as specified in ASTM C94. Discharge concrete into forms within 1-1/2 hours after introduction of water to cement. When temperature of concrete is 85 degrees F or above, the time between introduction of water to cement and complete discharge of concrete into forms shall not exceed 45 minutes.
- I. Integral Color: Davis Colors colored concrete pigments and ColorSeal II Tinted Cure and Sealer. Contact 800-356-4848. Integral color pigment per manufacturer's specifications. Colors specified in Plans.

- ## 2.3 FIBROUS CONCRETE REINFORCEMENT:
- Shall be 100% virgin polypropylene, fibrillated fibers containing no reprocessed olefin materials and specifically manufactured to an optimum gradation utilizing 25 individual fiber designs for use as concrete secondary reinforcement. Volume per cubic yard shall equal a minimum of 0.1% (1.5 pounds). Fiber manufacturer must document evidence of 5 year satisfactory performance history, compliance with applicable building codes and ASTM C1116 Type III 4.1.3 and ASTM C1116 Performance Level I. Acceptable manufacturer: Fibermesh Company, 4019 Industry Drive, Chattanooga, Tennessee, USA, 37416 or approved equal. Fibrous concrete reinforcement shall be utilized in all trail and walk applications.

- 2.4 EXPANSION JOINT FILLERS: Pre-molded closed cell polyethylene foam, equal to "Sonoflex F" by Sonneborn, Minneapolis, Minnesota conforming to AASHTO M213 or ASTM D1751 specifications. Provide ½-inch thick by depth of the slab material, allow ½ thickness for joint sealer.
- 2.5 EXPANSION JOINT SEALANT: Shall be a silicone material that is on CDOT's approved silicone sealant list. See Section 03300. Where color additive is used, color to match.
- 2.6 CURING COMPOUND: Clear Spray Applied Membrane Forming Liquid conforming to ASTM C309, Type 1. Curing Compound shall not reduce bonding or adhesion of finish materials applied to concrete surfaces.
- 2.7 TRUNCATED DOME INSERTS FOR RAMPS: Shall be in conformance with current Public Works standards.

PART 3: EXECUTION

- 3.1 PREPARATION OF SUBGRADE: Excavate to required depth. Remove soft, yielding material and replace with select fill. Compact to min. 95% Standard Proctor within 2% of optimum moisture.
- 3.2 MAINTENANCE OF SUBGRADE: Maintain subgrade in a compacted condition until concrete is placed.
- 3.3 FORMS: Metal or uniform warp free lumber, coated with form release agent. Slope forms to give slabs positive drainage and stake securely. Obtain approval of Owner for alignment and grade before placing concrete. Radii shall be continuous and flowing to avoid angular intersections in the horizontal alignment.
- 3.4 PLACING:
 - A. Concrete shall be formed, placed, vibrated and finished by hand using conventional methods. Concrete shall be placed at the line and grade shown on plans.
 - B. Place concrete on moistened subgrade monolithically between construction joints. Deposit to full depth in one operation. Consolidate immediately. After depositing concrete, screed and darby or bullfloat.
- 3.5 CONCRETE FINISHING:
 - A. After darbying or bullfloating, stop finishing until bleeding has ceased and until concrete can support foot pressure with only about 1/8-inch indentation. During or after the first floating, check planeness of surface with a 10-foot 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 1/8 inch in 10 feet.
 - B. Refloat slab immediately to a uniform sandy texture. Use steel trowel to densify surface, then apply medium broom finish to slab perpendicular to line of traffic.
 - C. Handicap Ramps:

1. Provide score joints in handicap ramps, heavily tooled in a 12" x 12" pattern in accordance with standard City of Denver detail.
 2. Install truncated dome inserts flush with the adjacent ramp surface, taking care to achieve a tight bond with the concrete, free of air pockets.
 - D. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.
- 3.6 FORM REMOVAL: Remove forms after concrete surface is hard enough so as not to be injured in any way. Reasonable care is to be used in removing forms. Repair minor defects with mortar. Plastering will not be permitted on exposed faces.
- 3.7 JOINTS: Construct joints true to line with faces perpendicular to surface.
- A. Expansion Joints: Expansion joint material shall be provided at the following locations and shall be in place prior to the placing of concrete: 1) at each end of curb return; 2) between sidewalk and driveway slabs or service walks; 3) between new concrete and existing concrete; 4) as shown on the plans; 5) between new concrete and fixed vertical objects, 5) at max. 120 foot spacing, or 6) as directed by the Owner.
 1. Thoroughly clean all surfaces prior to installation of caulking material.
 - B. Contraction (Control) Joints in Walks: Contraction joints shall be formed with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 3/8-inch-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 10 feet unless approved by the Owner. Depth of joints shall be one-fourth the slab thickness.
 1. Tooled joints will not be allowed on concrete trails, unless directed by the Owner.
 - C. Curb and Gutter Contraction (Control) Joints: Space curb and gutter joints not more than 12 feet 6 inches 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.
- 3.8 CURING: Thoroughly cure and protect concrete by keeping the surface moist for 7 calendar days or by use of curing compound applied in accordance with manufacturer's written instructions. Cure slabs with integral color in accordance with instructions of the pigment manufacturer using a pigmented membrane-forming curing compound with integral color to match concrete pigment. On exposed slabs with integral color, do not use polyethylene or paper sheeting.
- 3.9 SANDBLASTING: Concrete surfaces to be sandblasted shall be clean, dry and cured not less than 28 days prior to sandblasting operations. All lettering shall be cut using graphic cutting equipment. Font design, size and placement shall be followed as per plans. Easily damaged surfaces in the general proximity of sandblasting operations shall be suitably protected from overspray. During sandblasting operations, non-essential personnel shall be restricted from immediate work site area unless suitably protected from flying debris generated from sandblasting operations. Create sharp edges and a uniform profile to an approximate depth of 3/16 inch. Clean up of spent sandblast debris and materials are to be completed prior to any coatings or applications.

- 3.10 FIELD QUALITY CONTROL: Surfaces shall not vary more than 1/8-inch when tested with a 10 foot straightedge.
- 3.11 PROTECTION: Contractor shall be responsible for protecting the concrete flatwork until it is sufficiently hard. Concrete that is damaged by footprints, writing implements, or weather conditions is subject to replacement at no cost to the City.

END OF SECTION 02520

PART 1 - GENERAL

1.1 RELATED SECTIONS AND DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions apply to work of this section.

1.2 WORK INCLUDED:

- A. This Section specifies layout and paint lines on parking lots and play pads.

1.3 SUBMITTALS

- A. Product Data: Submit Technical Data sheets indicating compliance with the tests specified in Table II of Federal Specification TT-P-115 F.
- B. Samples: Submit sample color chip and standard color chip of Federal Specification 595 for white as applicable to court markings.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Perform pavement markings by installer regularly engaged in this type of work and with proper equipment for striping a project of this size.
- B. Material Compatibility: Verify compatibility of striping paint with sealers, joint sealants, and all other surface treatments specified in Division 2.
- C. Paint Materials: Paint markings shall not fade, crack, flake, or peel within the warranty period.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Material Storage: Store, mix and prepare paints only in areas designated for that purpose.
- B. Furnish clean cans and buckets required for mixing paints and for receiving rags and other waste materials associated with painting. Clean buckets regularly. At the close of each day's work remove used rags and other waste materials associated with painting.
- C. Take precautions to prevent fire in or around painting materials. Furnish and maintain hand fire extinguisher near paint storage and mixing area.

1.6 PROJECT CONDITIONS

- A. Do not apply pavement markings in wet weather or when the ambient or receiving material temperature is below 40 degrees F.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials meeting requirements of FS TT-P-115 F, Type II, for White and Yellow Highway Traffic Paints.
- B. White Paint: Match Federal Standard 595 for white paint and have the daylight directional reflectance specified in FS TT-P-115 F, Type I.
- C. Drying Time: Furnish paint with a no-pick-up maximum drying time of 20 minutes, when tested according to ASTM D711 using a wet film thickness of 0.015" and when applied and tested at 77° F.
- D. Provide Colorado Paint or equal for all additional colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to which paint will be applied and report immediately in writing to the Architect any conditions detrimental to the proper execution of this work. Do not proceed until unsatisfactory conditions are acceptably remedied.

3.2 PREPARATION

- A. Verify that surfaces to be painted are in proper condition to receive painting materials, that surfaces are clean, dry, smooth, and at proper temperature as recommended by paint manufacturer.
- B. Do not paint or finish any surface which is wet or damp.
- C. Clean all surfaces free of adhering foreign matter, dirt and dust.
- D. Lay out all striping, using dimension strings shown on plans, before painting. Report any discrepancies, interferences or changes in striping due to field conditions to Architect prior to painting. Paint Installer shall be required to remove paint, repair surface treatment and repaint stripes not applied in strict accordance with the drawings.

3.3 MIXING

- A. Do not intermix materials of different character or different manufacturer.
- B. Do not thin material except as recommended by manufacturer.

3.4 APPLICATION

- A. Apply painting and finishing materials in accordance with the manufacturer's directions. Use applicators and techniques best suited for the material and surfaces to which applied.

- B. Apply paint with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates.
- C. Minimum wet film thickness shall be 0.015".

3.5 PROTECTION

- A. Provide protections to ensure that work will be without damage or deterioration until final acceptance.

END OF SECTION 02580

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division – 1 Specification sections apply to work of this section.
- 1.2 SUMMARY:
- A. Work Includes: Furnishing and installing subdrainage systems as shown on the Drawings or specified herein, or as required to complete the work.
 - B. Related Work:
 - 1. Excavating, backfilling and compacting for utilities – Section 02220
 - 2. Surfacing materials – Section 02865.

PART 2: PRODUCTS

- 2.1 MATERIALS
- A. PVC Underdrain: ASTM D2729, minimum 4 inch diameter, plain or perforated type as indicated on the Drawings, with required fittings. Perforated pipe shall comply with requirements of ASTM 272a, with 2 rows of evenly spaced 3/8-inch diameter perforations, 120 deg apart, providing a minimum number of holes of 2 per foot (total for both rows).
 - B. Geotextile Fabric: Non-woven fabric equal to Mirafi 140N.
 - C. Filter Material: 3/4" crushed rock around solid pipe. Around perforated pipe, follow manufacturer's recommendations.

PART 3: EXECUTION

- 3.1 INSTALLATION
- A. PVC Underdrain: Install pipe underdrains as shown on the Drawings. Pitch at min. 0.5%.
 - B. Geotextile fabric used for the pipe underdrains system shall be placed in the trench once pipe trench is prepared to receive pipe. The fabric shall be placed in full contact with the trench bottom and sides. The fabric shall be secured to the trench sides or top edge in a manner which does not damage the integrity of the fabric. The fabric shall be protected from damage during the placement of the pipe and granular fill. Fabric edges shall overlap at least 6 inches for the full width of the trench.
- 3.2 CLEANING: Clean and flush out lines before covering. Remove and legally dispose of all waste material and debris offsite.

- 3.3 RESTORATION: Restore all fences, ditches, yards, lawns, and other structures or surfaces to condition equal to or better than before work began.

END OF SECTION 02710

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY: The work of this section consists of constructing one or more surface courses composed of a mixture of aggregate, filler if required, and bituminous material, placed on a prepared base.
- 1.3 REFERENCES: Plant mix pavements for this project shall be done in accordance with MGPEC Item 9 – Hot Mix Pavement (HMA) and Stone Mastic Asphalt (SMA) specifications, latest edition, available from MGPEC at 303-979-2190 or the City Project Manager. Top Lift – “Grading SX, N=75, PG 58-28 binder, 20% maximum RAP.” Bottom Lift – “Grading S, N=75, PG 58-28 binder, 20% maximum RAP.”
- A. The MGPEC specifications to be used for this project are written as a stand-alone document. Included with the specifications are checklists for mix identifying Asphalt Construction Application and Asphalt Mixture Requirements.
- B. All references to measurement and payment in MGPEC Item 9 shall be deleted. Refer to Section 01025 for method of measurement and basis of payment applicable to this contract.

PART 2: PRODUCTS (Not Applicable)PART 3: EXECUTION (Not Applicable)

END OF SECTION 02740

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division-1 Specification sections apply to Work of this Section.

1.2 SUMMARY:

- A. Work of this Section consists of installation of an underground irrigation system including the following:
1. Trenching, stockpiling excavation materials, refilling and compacting trenches.
 2. Complete irrigation system including but not limited to piping, valves, fittings, heads and wiring, and final adjustments to insure complete coverage.
 3. Water connections.
 4. Replacement of unsatisfactory materials.
 5. Cleanup, inspections, and approval.
 6. Tests.
- B. Related Work:
1. Concrete Flatwork: Section 02520
 2. Soil Preparation: Section 02920
 3. Turfgrass Seeding: Section 02932
 4. Native Seeding: Section 02933
 5. Sodding: Section 02935
 6. Trees and Shrubs: Section 02950
 7. Tree Retention and Protection: section 02150

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 ASSURANCE

- A. Irrigation Contractor Qualifications – Irrigation Contractor shall have had considerable experience and demonstrate ability in the installation of irrigation system(s) of specific type(s) in a neat, orderly and responsible manner in accordance with recognized standards of workmanship. To demonstrate ability and experience necessary for this Project, submit if requested by Parks Project Manager, prior to contract award the following:

1. List of 3 projects completed in the last 2 years of similar complexity to this project. Description of projects shall include:
 - a. Name of project.
 - b. Location.
 - c. Owner.
 - d. Brief description of Work and project budget.

B. Special Requirements.

1. Work involving substantial plumbing for installation of copper piping, backflow preventer(s), and related Work shall be executed by licensed and bonded plumber(s). Secure a permit at least 48 hours prior to start of installation.
2. Tolerances - Specified depths of mains and laterals and pitch of pipes are minimums. 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, or planting done under other Sections during Work associated with installation of irrigation system at no additional cost to the City.
5. Water Delivery Interruption – When working on an existing irrigation system, the Irrigation Contractor shall contact the Parks Project Manager and inform him 72 hours in advance of any water interruption that is required.
6. Contractor shall post signage in visible locations on site indicating “IRRIGATION TESTING AND MAINTENANCE IN PROGRESS” when Work (construction or warranty) requires irrigation system operation between the hours of 10AM to 6 PM.
7. Work involving high voltage electrical wiring, grounding and related Work shall be executed by licensed and bonded electrician(s). Secure a permit at least 48 hours prior to start of installation
8. Coordination with other contractors: Irrigation installer shall protect, maintain, and coordinate his work with other work under this contract.
9. Refer to maintenance requirements for water during construction, 1.9.B.1.
10. Contractor to complete central control certification checklist as part of the central control installation. Refer to appendix c for sample checklist.

C. 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 10 days prior to commencement of Work. All parties required to be in attendance shall be notified no later than 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 Parks Project Manager, Contractor's Superintendent, and Installer.
2. Prior to commencement of Work, Contractor shall schedule an on-site conference with Parks Project Manager, Parks Forestry and any other parties designated by Parks Project Manager to discuss tree protection requirements, marshalling locations, traffic control, and equipment access. Provide a minimum of 7 days

notice prior to date of conference.

3. Contractor shall schedule weekly on-site conferences with Parks Project Manager and any other parties designated by Parks Project Manager to review project progress.
4. Contractor or Consultant as designated by Parks shall record Minutes of each conference and distribute to all parties in attendance within five (5) days of conference.

1.5 SUBMITTALS - Prepare and make submittals in accordance with conditions of the Contract prior to installation of any irrigation equipment:

- A. Material List: Submit a complete list of materials, 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.
- B. Shop Drawings: If applicable, submit shop drawings indicating electrical wiring design and assembly of backflow preventer, including plumbing and foundation/support system if the installation differs from the manufacturer's recommended installation.
- C. Samples:
 1. Valve clusters: Provide a completely built electrical valve cluster. This mock-up, to include three electric valves, quick coupler, angle valve, and manifold and riser, may be incorporated into the work toward the end of the project.
 2. Swing joints: Provide a pre-manufactured or constructed swing joint assembly as per detail.
- D. Operation and Maintenance Data: Coordinate scheduling/precipitation instructions with the City's maintenance personnel. Submit three (3) bound brochures to Parks Project Manager including:
 1. Winterization and spring start-up procedures.
 2. Cut sheets of products.
 3. Manufacturer's maintenance and checking instruction for irrigation controller.
 4. Manufacturer's maintenance and operation instruction for weather station and any other water conservation equipment.
 5. Manufacturer's maintenance and checking instruction for backflow preventer (if applicable).
 6. Manufacturer's maintenance and operation instruction for pump station (if applicable).
- E. Warranty: Submit one year written warranty, in accordance with Paragraph 1.8 below.
- F. Record Drawings (As-Built):
 1. At onset of irrigation installation, Contractor will secure Xerox copies of original irrigation design from Parks Project Manager. Contractor to revise hard copy drawings in red ink as Work progresses to show any deviations from the design. Record Drawings shall be brought up-to-date at the close of the working day every Friday by a qualified draftsman. A print of Record Drawings shall be

available at Project Site for review. Updated Record Drawings shall be available for review at all times.

2. Record Drawings shall encompass entire scope of work including any altered existing equipment and altered zones. For systems that are altered less than 50 % of entire site size, the record drawing shall encompass the scope of work, and notate the controller zone number, type of irrigation, GPM, operating PSI for any altered or added zone.
3. Preparation of Record Drawings (As-Builts): Dimension from two permanent points of reference (building corners, sidewalk, road intersections or permanent structures) the location of the following items:
 - a. Point of connection.
 - b. Routing of sprinkler pressure lines. Provide dimensions for each 100 L.F. (maximum) along each routing and for each change of direction.
 - c. Routing of non-pressure lateral lines, layout and size.
 - d. Sprinkler control valves.
 - e. Quick coupling valves.
 - f. Drain valves
 - g. Master valves
 - h. Flow sensors
 - i. Rain sensors/weather station
 - j. Wire splice boxes
 - k. Control wire routing if not with pressure mainline.
 - l. Gate valves.
 - m. Air relief valves.
 - n. Sleeves.
 - o. Flush valves.
 - p. Power service drop.
 - q. Other related equipment as directed.
4. Make dimensions accurately at the same scale used in the original drawings, or larger. Notes and dimension lettering must be legible.
5. 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.
6. Parks Project Manager will not certify any pay request submitted by the Contractor if the As-Built Drawings are not current, and processing of pay request will not occur until As-Built Drawings are updated.
7. Final Submittal: Upon completion of Project, prior to final acceptance, secure digital copy of irrigation design from Parks Project Manager and record As-Built information that reflects all changes made over the course of the construction project, prepared by a qualified draftsman. As-Built Drawings shall include details, including any revisions as per actual installation. Deliver and submit to Parks Project Manager for review one 3 mil. Mylar prints of As-Built, and digital As-Built drawing on disk in both PDF and CAD format (include any related X-ref files, plot files and pen settings.) Make any additional changes to the file as directed by the Parks Project Manager prior to final submittal and approval.
8. Request for final payment will not be certified or processed until all As-Built prints and digital files have been received and approved.

G. Controller Zone Maps and Programming Schedule:

1. Do not prepare zone maps and programming schedules until record drawings have been reviewed and approved by the Parks Project Manager. Project Manager shall provide an example of Controller Charts required.
2. Provide one controller zone map for each automatic controller installed.
 - a. Chart shall be reproduction of record drawing, one page sized 11" by 17". If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility.
 - b. Chart shall be print of actual record drawing of the system, showing the entire area covered by that controller on one sheet.
 - c. Identify controller, all remote valves and lateral lines of each remote control valve, using a distinctly different color for each zone. Include the entire area of the controller's coverage. Provide a legend.
3. Provide one zone map for the entire project.
 - a. Chart shall be reproduction of record drawing, one page maximum 36" by 48", photo reduced to maximum size and legibility.
 - b. Identify all controllers, remote valves and lateral lines using different colors to distinguish adjacent zones.
4. Provide one controller programming schedule for each automatic controller installed, one page maximum, 8-1/2" by 11". Project Manager shall provide an example of Controller Programming Schedule required.
5. Following review of charts and schedules by Parks Project Manager, provide two additional color duplicates of controller charts and controller schedules. One set of controller charts and schedules shall be laminated between two layers of 3 mil. plastic sheet. Provide digital copies of charts and schedules in pdf format.
6. Charts and controller schedules shall be completed and reviewed prior to final review of irrigation system.
7. Request for final payment will not be certified or processed until all prints and files for controller charts and schedules have been received and approved.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. 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.
2. Handling, storage and delivery of PVC pipe:
 - a. Exercise care in handling, loading and storage of PVC pipe.
 - b. Provide 48 hours advance notice of delivery to Parks Project Manager for observation of unloading and handling of PVC materials during delivery.
 - c. All PVC pipe shall be transported in a vehicle which allows length of pipe to lie flat so as not to subject it to undue bending or concentrated external loads. All sections of pipe that have been dented or damaged shall be discarded, and if installed, shall be replaced with new piping.

B. Storage and Protection:

1. 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.

1.7 JOBSITE CONDITIONS:

A. Existing Conditions:

1. Soil Conditions: Investigate the type of soil and conditions in which lines are to be installed and allow for same in proposal. No extra payment will be allowed due to difficulty in trenching, unless approved by the Parks Project Manager.
2. Contractor is responsible for understanding the scope of related operations as specified and indicated in the Drawings and Specifications before beginning Work under this Section.
3. Report unsatisfactory conditions in writing to the Parks Project Manager. Commencement of installation means acceptance of existing conditions by the Contractor

B. Protection of Property:

1. Preserve and protect all trees, plants, monuments, structures, and paved areas from damage due to Work of this Section. In the event damage does occur, all damage to inanimate items shall be completely repaired or replaced to satisfaction of the Parks Project Manager, and all injury to living plants shall be repaired or replaced by the City. All costs of such repairs shall be charged to and paid by Contractor.
2. 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, or other building material surfaces shall be repaired or replaced at no cost to the City. Restore disturbed areas to original condition.

C. Protection of Existing Trees:

1. Consult with Parks' Forestry as requested by Project Manager prior to trenching or boring within tree drip-lines. All trenching or work under limb spread of any and all evergreens or low branching deciduous material shall be done by hand or by other methods so as to prevent damage to limbs or branches.
2. Where it is necessary to excavate adjacent to existing trees, use all possible care to avoid injury to trees and tree roots. Excavation in areas where 2-inch and larger roots occur shall be done by hand. Roots 2 inches or larger in diameter, except directly in the path of pipe of conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a trenching machine is operated close to trees having roots smaller than 2 inches in diameter, wall of trench adjacent to tree shall be hand trimmed, making clean cuts through roots. Trenches adjacent to trees shall be closed within 24 hours, and when this is not possible, side of trench adjacent to tree shall be kept shaded with moistened burlap or canvas.
3. Directional micro-boring is permitted within TPA (tree protection area) must

D. Protection and Repair of Underground Lines:

1. Request proper utility company to stake exact location (including depth) of all underground electric, gas, sewer, and telephone lines. Take whatever precautions are necessary to protect these underground lines from damage. If damage does occur, all damage shall be repaired by Utility Owner. All costs of such repairs shall be paid by Contractor unless other arrangements have been made.
2. Request City, in writing, to locate all private utilities (i.e., electrical service to outside lighting) before proceeding with excavation. If, after such request and necessary staking, private utilities which were not staked are encountered and damaged by Installer, they shall be repaired by the City at no cost to Installer. If Contractor damages staked or located private utilities, they shall be repaired by Utility Owner at Contractor's expense unless other arrangements have been made.

E. Replacement of Paving and Curbs:

1. Where trenches and lines cross existing roadways, paths, curbing, etc., damage to these shall be kept to a minimum and shall be restored to original condition.

1.8 WARRANTY/GUARANTY:

- A. Provide one year written warranty for material and installation from date of Substantial Completion.
- B. Expenses due to vandalism before Substantial Completion shall be borne by Contractor.
- C. Settling of backfilled trenches which may occur during guaranty period shall be repaired at no expense to the City, including complete restoration of damaged property.
- D. City will maintain turf and planting areas during warranty period, so as not to hamper proper operation of irrigation system, unless maintenance by Contractor is specified by contract. Contractor is responsible to monitor and coordinate controller scheduling and maintenance with Parks maintenance staff for any seeding, sodding or planting areas under Contractor's warranty.
- E. The City and County of Denver Department of Parks and Recreation reserves the right to make temporary repairs during the warranty period as necessary to keep systems in operating condition without voiding the Contractor's warranty, nor relieving Contractor of his responsibilities.
- F. Contractor shall make repairs and replacement promptly when notified, within three days of notification. If Contractor fails to make repairs within three days, City may make such repairs at Contractor's expense.

1.9 MAINTENANCE:

- A. Where applicable, furnish the following maintenance items to City prior to Final Acceptance:
 - 1. Two sprinkler heads for each size and type specified. Two nozzles for each type of head.
 - 2. Two wrenches for each type of head cover. Two wrenches for removing and installing each type of head.
 - 3. Two valve keys for operating each type of manual valve.
 - 4. Two keys for valve markers.
 - 5. Two keys for valve box covers.
 - 6. Two valve keys and hose swivels for each type of quick coupling valve, four controller cabinet keys, and one remote control device for each project.

1.10 Maintenance During Project Construction:

- A. Contractor shall fence, water and keep weed free any turf and planting areas within active phases of construction. Coordinate controller scheduling and maintenance operations with Parks maintenance staff and Parks Project Manager for portions of Park property unaffected by current phases 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 72 hours.
- B. Additional Maintenance During Warranty Period:
 - 1. Make repairs and replacements needed due to defective workmanship and materials.
 - 2. Winterization – include cost in bid for winterizing complete system at conclusion of irrigation season (during which system received final acceptance) within 3 days notification by the City. System shall be voided of water using compressed air or similar method accepted by Parks Project Manager. Reopen, operate and adjust system malfunctions accordingly during April of following season within 3 days of notification by City.

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 Drawings, the Drawings shall govern.
- B. All material shall be of the highest grade possible and where applicable, shall be marked accordingly. All material shall be new.

2.2 PIPE AND PIPE FITTINGS:

A. Main and Lateral Lines:

- 1. Main Lines (pressurized, downstream of backflow prevention units):

- a. Class 200 PVC BE (size 1-1/2" through 2-1/2")
 - b. Class 200 PVC RT (size 3" and larger).
 - c. Velocities in PVC mainline shall not exceed 5 FPS.
 - d. All PVC pipe will conform to the requirements of the United States Department of Commerce commercial standard Type 1-ASTM-D-2241.
 - e. HDPE pipe, pressure rating DR 9 (200 PSI) may be used by approval of Project Manager for portions of mainline that require boring such as below trees and paving. HDPE requires fusion butt weld transition to PVC mainline using ISCO Industries IPS Bell MJ Adapter with kit, model #ISMFMJ03IPSBELL.
2. Lateral Lines: 100 PSI High Density NSF Polyethylene Piping - 1" minimum diameter.
 - a. Velocity of water flow in polyethylene pipe shall not exceed 7-1/2 feet per second.
 3. Main line water flow velocity shall not exceed five (5) feet per second.
- B. Sleeving:
1. Horizontal sleeves under paved surfaces: Class 200 PVC.
 2. Vertical sleeves for access to drains and valves: Class 200 PVC.
 3. Horizontal sleeving for boring applications: HDPE
- C. Brass Pipe and Fittings:
1. Brass Pipe - 85% red brass, ANSI Schedule 40 screwed pipe.
 2. Fittings - Medium brass, screwed 125 pound class.
- D. 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. Gasketed End Pipe (Pressurized main line 3" and larger) – Manufactured from virgin Polyvinyl Chloride compound in accordance with ASTM D2241 and ASTM D1784; cell classification 1254-B, Type 1, Grade 1.
 - a. All fittings and service tees (3" and larger) – Harco or Leemco ductile iron, grade 70-55-05 in accordance with ASTM A-536. Fittings shall have deep bell push-on joints with factory installed gaskets meeting ASTM F-477.
 - b. Lubricant – As recommended by manufacturer of pipe fittings.
 - c. Pipe Restraints on all fittings and service tees and pipe to pipe restraints: Harco or Leemco, installation as recommended by manufacturer. Joint Restraint shall be used on all Valves and Ductile Iron Fittings where there is a change of direction (such as a bend or tee) or flow area (such as a reducer, cap/plug). Each fitting bell shall be restrained to the pipe inserted in it per manufacturer's recommendations. See Manufacturer catalog for appropriate selection or chart supplied on plans.

3. SDR21-200 PVC pipe (Pressurized main line 2-1/2" and under).
 - a. Pipe will be assembled with Schedule 80 PVC fittings using ASTM-F-656 purple primer followed with heavy bodied ASTM-D-2564 glue.
 - b. Fittings shall be installed with thrust blocks as per Detail.
4. Flexible Plastic Pipe (non-pressure lateral lines):
 - a. Manufactured from virgin polyethylene in accordance with ASTM D2239, designated as PE 3408. Maximum size 2"; minimum size 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 2 clamps per joint on all insert fittings.
 - d. Risers for Pop-up Heads - Shall be swing pipe, 0.49 ID, operating pressure of 80 PSI, manufactured by Rainbird or equal.

2.3 VALVES:

A. Gate Valve or Isolation Valve:

1. Valve for 3" and larger mainline: Shall be cast iron body, push-on, left-hand opening, square nut operated, rubber resilient seated, mechanical joint AWWA gate valve with clear waterway equal to full diameter of pipe. Able to withstand continuous working pressure of 150 PSI. Wheel type handle is unacceptable.
2. Valve for 2-1/2" and smaller mainline (solvent-weld): Shall be Matco-Norca 10RS resilient wedge gate valve with threaded ends and non-rising stem.

B. Automatic Control Valve:

1. Automatic Valve for Potable Water System: Rain Bird PEB-PRS-D Series Valve having manual flow adjustment and manual bleed nut.
2. Automatic Valve for Non-Potable Water System: Rain Bird PESB-PRS-D Series Valve.
3. Manifold: Manifold to be constructed out of Schedule 80 PVC pipe, fittings, and nipples, with ductile iron riser nipple and angle valve Champion brass body 200RS angle valve with brass unions as per details and plans.

C. Manual Drain Valve:

1. Drain Valve: Mueller Oriseal #H-10283 or MacDonald AY 1" 3061 with brass swing joint assembly.

D. Quick Coupling Valves:

1. Buckner "Wing Thing" Q44LCAR10 brass two-piece body with winged stabilizer, designed for working pressure of 150 PSI; 1" FIP. Equip quick coupler with locking rubber cover, key and brass swivel. Size as shown on Drawing
2. All Quick Coupling Valves to be used for winterization shall be constructed of all brass swing joint and fittings.

E. Master Valve:

1. Mainline 2" and larger Master Valve shall be Bermad 410 normally open valve.

2. Mainline smaller than 2" Master Valve shall be Superior 3100 normally open valve.
- F. Flow Sensor Assembly:
1. Mainline 1-1/2" – 4" and with flow greater than .5 feet per second, flow sensor shall be Data Industrial 228-PV, sized according to mainline size.
 2. Mainline larger than 4", flow sensor shall be Data Industrial 220-B mounted with Harco tapping saddle sized according to mainline size.
 3. Mainline 1" with flow less than .5 feet per second, flow sensor shall be Data Industrial 4000
- G. Valve Boxes:
1. All valve boxes will have a stainless steel hex bolt locking system.
 2. Isolation Valves, Quick Coupling Valves, Drain Valves, Wire Splices and Ground Rods - Carson Brooks 10" round box,
 - a. brand lids: Isolation/Gate Valve with "GV", Quick Coupler Valve with "QC", Manual Drain Valve with "DV", Air Relief Valve with "AR", Master Valve with "MV", Flow Sensor with "FS" and Wire Splice Box with "SB".
 3. Electric Control Valve Box: Shall have locking cover branded with the zone number.
 - a. Single or double valve location only, 3/4 inch through 2 inch: Carson Brooks #1220 jumbo box with 910-4 bolt down T-cover.
 - b. Multiple valve clusters, 3/4 inch through 2 inch, max. three (3) control valves per box: Carson Brooks #1730-18 box with 910-4 bolt down T-cover or Rain Bird VB Max.
 4. Box Color for valves shall be green for potable systems, purple for non-potable systems.
 5. Gravel Leveling Bed and Drainage Sump in Valve Boxes: 3/4" crushed gravel lined in geo-textile, as indicated on Drawings.
- H. Backflow Preventer:
1. High hazard, reduced pressure type, approved by USC or other approved testing laboratory; fully ported, ball-type gate valves on units 2" or smaller, resilient gate valves on units larger than 2"; as manufactured by Febco or approved equal.
 2. Backflow Preventer Cover: Guardshack enclosure of appropriate size, equipped with Lock Shield Brackets, manufactured by BPDI, phone: 800-266-5411. Color: forest green.
 3. For devices 2" and smaller, install Sentry SC75-200 locking device.
 4. Concrete Pad: Comply with Section 02520.
- I. Air Relief Valve:
1. On systems 3" or larger, as per plan: Bermad 4415 (all cast iron) 2" double purpose vacuum air release valve.
- J. Pressure Reducing Valve:

1. Watts commercial grade or equal required where system pressures exceed 100PSI.

2.4 SPRINKLER HEADS:

- A. Heads: Provide fabricated riser units of the type and size as indicated on the 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: Rain Bird 1804 SAM-PRS or 1806 SAM-PRS.
 2. Pop-Up Sprinkler Heads in native grass areas and flower bed areas: Rain Bird 1812 SAM-PRS.
 3. Pop-Up Sprinkler Nozzles shall be Rain Bird U-Series nozzle. Strip series, rotary, MPR and VAN nozzles may be used for specific approved applications.
 4. Gear Driven Heads: Hunter I-20, I-25, I-40 or Rain Bird 3500, 5000 Plus, 5500, or 8005 series with stainless steel risers, SAM, PRS and MPR options as available.
- B. Flexible Connectors to Lateral Pipe:
1. Pop-up Heads: Shall be Rain Bird Swing Pipe, 1/2" SPX Series, connected to lateral pipe with Rain Bird SBE-050 spiral barbed ell PVC insert fittings.
 2. Gear Driven Heads: Shall be field constructed swing joints as per detail, connected to lateral pipe with PVC insert fittings.

2.5 LOW VOLUME IRRIGATION

- A. Valve – Rain Bird X CZ 100 B Com for reuse water and X CZ 150 Com for potable water. Valves shall be installed in Carson Brooks #1220 jumbo box or approved equal with 910-4 bolt down T-cover. Brand lid with zone number.
1. All low volume irrigation shall be zoned independently from turf, and product applications may not be mixed within zone.
- B. Lateral pipe – Flexible polyethylene pipe as per specifications 2.2.D.4. See Drawings for installation depth.
- C. Sub-surface irrigation – Netafim Techline CV, 0.26 or .4 GPH emitter with 12" or 18" spacing. See Drawings for installation and depth of pipe.
1. Requires Netafim 120 mesh filter in Carson 1419-12 valve box with corner hex bolt down cover. Brand lid with "FIL".
 2. Flush valve in Carson round 10" valve box with bolt down T-cover as per Drawings. Brand lid with "FV".
- D. Tree/Shrub Bubblers – Rain Bird 1400 series Tree and Shrub Bubbler or Rain Bird SQ nozzle installed as per Drawings.
1. Discharge rate must not exceed soil infiltration rate.

2. Top of bubbler or nozzle shall not exceed 2" height above mulch/soil surface.

2.6 AUTOMATIC CONTROL SYSTEM:

A. Automatic Controller:

1. Central Control systems shall be Toro Sentinel special build central control with wireless output boards. Update to Sentinel central control is required on all projects unless a variance is granted by Denver Parks Water Conservation.
 - a. Sentinel satellite controller in prefabricated enclosure with pedestal is available exclusively through C.P.S. Distributors. Contractor shall purchase fully assembled enclosure including back panel, terminal strips, power supply unit, interior fused disconnect with 120 volt duplex outlet, heavy duty transient surge protection boards, antenna(s) with cable, louvers and fan kit. Enclosure and pedestal shall be stainless steel with factory applied powder coating finish, color #6005 Tiger Drylack color chart. Enclosure shall have a heavy duty hasp for locking. Model number is per plan as specified by Toro.
 - b. Provide one hand-held remote control unit for each project specified or as specified per plan.
 - c. 450 MHz radio communication shall be fully compatible with Denver Parks and Recreation frequency required by the Operations District.
2. If variance is granted, Controller must have the following minimum characteristics:
 - a. Solid state, 14-day clocks, with multiple programming capabilities.
 - b. Capable of opening normally closed electric solenoid type valve.
 - c. Automatic Timing: Capable of incremental units from 3 to at least 60 minutes per station.
 - d. Water Budgeting: Capable of global program run time changes in percentage increments.
 - e. Ability to provide repeat and/or syringe cycle capabilities and ability to eliminate or isolate one station without disturbing remaining controller features.
 - f. Flow sensing capability with automatic shut-down or alarm signal.
 - g. Minimum 40 VA transformer rating.
 - h. Controller cabinets shall be stainless steel Strongbox or Hoffman enclosure with factory-applied Federal Green powder-coat finish and heavy duty locking hasp. Size cabinet per specification from manufacturer.
 - i. Controller and cabinet require grounding per manufacturer recommendations, outside disconnect, inside fused disconnect, interior duplex GFI outlet.
3. Controller and remote control equipment: Manufacturer and Model shall be noted on Drawing.
4. Contractor shall provide concrete pad, 120V electrical power, conduits, grounding and control wire connections to terminal surge strips .
5. Concrete Pad: Comply with plan detail and Section 02520.

B. Electrical Control Wiring:

1. Low Voltage:

- a. Two Wire wire to be Paige Spec 12 AWG P7350D. Install grounding for two wire system in accordance with plans and per the direction of the project manager and Toro representative.
 - b. Electrical Control Wire for 24VAC solenoid – Golf Course Sprinkler Wire - #14 to #10 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation .045” thickness.
 - c. Electrical Common Wire – Golf Course Sprinkler Wire - #12 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation .045” thickness.
 - d. Data Wires – Paige 7171D-A direct burial shielded and armored signal cable with polyethylene jacket.
 - e. Wire Colors: Consistent color system throughout.
 - 1) Control Wires – Black.
 - 2) Common Wires – White.
 - 3) Spare Control Wires – Red.
 - 4) Spare Common Wires – Purple.
 - 5) Data Wires – Green and Blue
 - 6) Tracer Wire – Yellow
 - f. Control Wire connections and splices shall be made with 3M DBM direct bury splice, or similar UL listed dry splice methods.
2. Splice Box: Carson Brooks 10” round box, branded “SB.”
 3. Mainline Tracer Wire – Install one continuous AWG UL No. 10 tracer wire as detailed above all mainline. Loop wire into control box. Color shall be yellow.
 4. High Voltage – Type required by local codes and ordinances, of proper size to accommodate needs of equipment serviced.

2.7 MISCELLANEOUS MATERIALS:

- A. Rain Sensor: Hunter wireless Rain Klik with by-pass or Mini-Klik (wired) with Sensor Guard or approved equal. Rain sensor shall be installed per manufacturer’s recommendations.
- B. Concrete Thrust Blocks as per plan for all 2-1/2” and smaller PVC solvent weld mainline: Minimum of one cubic foot of cast-in-place concrete in compliance with Section 03300 and 3.3.C below.

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 Drawings does not relieve the Contractor of the responsibility for utility location. Route trenches to avoid existing utilities. Verify with the Parks 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 Parks 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 Parks Project Manager before staking or installation of any irrigation system begins.
- E. Layout: Lay out 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 Parks Project Manager 48 hours in advance and request review of staking. Parks Project Manager will advise installer as to the amount of staking to be prepared. Parks 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.
 - 2. Valve boxes and mainline will not be located in ball fields, and multi-use sport fields, recovery zones, or below playground equipment.
 - 3. If project has significant topography, freeform planting beds, or other amenities which could require alteration of irrigation equipment layout as deemed necessary by Parks Project Manager, do not install irrigation equipment in these areas until Parks Project Director has reviewed equipment staking.
 - 4. Parks Project Manager may request Parks Forestry approval of proposed trenching prior to start of trenching.
 - 5. Review backflow prevention device location and operation with Parks Project Manager prior to mainline installation.

3.2 EXCAVATION AND BACKFILL:

- A. Install mainline pipe and wire sleeving under existing asphalt paving, concrete walks and critical root zones by directional boring. Pot-hole existing utilities for location and depth in advance of boring operations. When pot-holing in cross streets: include all permits, traffic control, backfill, compaction and surface restoration as required by the City and County of Denver Transportation Engineering Standards and Specifications. Compact backfill around end of sleeves to 95% compaction in landscape areas.
- B. Excavation:
 - 1. Trenching:

- a. Trench excavation shall follow, as much as possible, 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. Keep trenches at least 6 feet from trunk of existing trees. Refer to Section 02150: Tree Retention and Protection for additional precautions.
2. Clearances:
3. Main pressure line: Make trenches of sufficient width to properly assemble and position pipe in trench. Clearances:
- a. Piping 3" and Larger: Minimum clearance of piping 3" or larger shall be 5 inches horizontally on both sides of the trench.
 - b. Piping 2-1/2" and Smaller: Trenches shall have a minimum width of 4 inches.
 - c. Line Clearance: Provide min. 6 inches of clearance between each line, and min. 12 inches of clearance between lines of other trades.
 - d. Lateral pipe: Trenches shall have a minimum width of 4 inches.
 - e. Line Clearance: Provide not less than 6 inches of clearance between each line, and not less than 12" of clearance between lines of other trades.
4. Pipe and Wire Depth to finish grade:
- a. Pressure Supply Piping within Parks – 30 inches from top of pipe (maximum variation 2").
 - b. Pressure Supply Piping within Right-of-Way – 24 inches from top of pipe (maximum variation 2").
 - c. PVC Sleeving – at specified pipe or wire depth.
 - d. Non-pressure Piping (gear driven heads) – 18 inches from top of pipe (maximum variation 2").
 - e. Non-pressure Piping (pop-up heads) – 18 inches from top of pipe (maximum variation 2").
 - f. Control Wiring – Side of pressure main when installed in the same trench; 24 inches from top of wire bundle where installed separately from mainline trench.
5. Boring will be permitted only where pipe must pass under obstruction(s) which cannot be removed. In backfilling bore, final density of backfill shall match that of surrounding soil. It is acceptable to use sleeves of suitable diameter installed first by jacking or boring, and pipe laid through sleeves. Observe same precautions as though pipe were installed in open trench.
6. Vibratory Plow: Not permitted without written authorization of Parks Project Manager.

3.3 INSTALLATION OF IRRIGATION EQUIPMENT: Locate all equipment as near as possible to locations designated. Deviations shall be reviewed and approved by Parks Project Manager prior to installation.

A. Sleeving:

- 1. Install sleeving under asphalt paving and concrete walks prior to concreting and paving operations to accommodate piping and wiring.
- 2. Minimum depth to top of pipe shall be determined by depth of mainline and

- lateral lines.
- 3. Lay sleeve to drain at minimum grade of 3" per 100'.
- 4. Sleeving located under areas where asphalt or concrete paving will be installed shall be bedded with sand (a layer 6" below pipe and 6" above pipe).
- 5. Compact backfill material in 6" lifts at 95% maximum density determined in accordance with ASTM D1557, using manual or mechanical tamping devices.
- 6. Sleeving under existing walks or concrete pavement shall be done by jacking, boring or hydraulic driving, but where cutting of asphalt and/or concrete is necessary, it shall be done and replaced at no cost to the City. Obtain permission to cut walks from Parks Project Manager.
- 7. Do not allow sleeves to become filled with soil or other undesirable material. Tape ends of sleeves until commencement of pipe installation.
- 8. Mark sleeves as per plans in a manner to ensure easy location in the future.

B. Installation of Piping:

- 1. PVC Mainlines:
 - a. Snake pipe in trench as much as possible to allow for expansion and contraction. Place manual drain valves at low points and dead ends of pressure supply piping to insure complete drainage of system. When pipe laying is not in progress, or at end of each day, close pipe ends with tight plug or cap. Perform Work in accordance with good practices prevailing in piping trades.
 - b. Slope pipe at minimum 3" per 100' to manual drain valve and drainage sump. Field adjust as needed.
 - c. Solvent Weld PVC Pipe (all pipes 2-1/2" and smaller): Lay pipe and make all plastic to plastic joints in accordance with manufacturer's recommendations. Do not install pipe when air temperature is below 40 degrees (F).
 - d. Gasketed End Pipes: Lay pipe and make pipe-to-fitting or pipe-to-pipe joint, following OR70 recommendations (Johns-Manville Guide for Installation of Ring-Tite Pipe), or pipe manufacturer's recommendations. Install Harco or Leemco fittings and pipe restraints on all fittings and adjacent pipe runs per manufacturer's recommendations. .

C. Thrust Blocks on 2-1/2" and smaller PVC mainline: Construct thrust blocks as per plans.

- 1. Contact Parks Project Manager prior to placing thrust blocks, for observation of thrust block excavation and initial placement. Size thrust blocks per plan:
- 2.

Soil Type	lbs./SF
a. Mulch, Peat, etc.	0
b. Soft Clay	500
c. Sand	1,000
d. Sand and Gravel	1,500
e. Sand and Gravel with Clay	2,000
f. Sand and Gravel Cemented with Clay	4,000
g. Hard Pan	5,000

D. Flexible Plastic (Polyethylene) Pipe –

- 1. Lay pipe and assemble fittings according to manufacturer's recommendations.

E. Control Wiring - Low Voltage Wiring:

1. Bury control wiring between controller and electric valves in pressure supply line trenches, strung as close as possible to main pipe lines with such wires to be consistently located below and to one side of pipe, or in separate trenches.
2. Install tracer wire as per plan detail.
3. Bury control wiring between controller and electric valves in pressure supply line trenches, strung as close as possible to main pipe lines with such wires to be consistently located below and to one side of pipe, or in separate trenches.
 - a. Bundle all 24 volt wires at 10 foot intervals and lay with pressure supply line pipe to one side of the trench.
4. Provide an expansion loop at every pressure pipe angle fitting, every electric control valve location (in valve box), and every 500 feet. Form expansion loop by wrapping 24" of wire around a 3/4 inch pipe and withdrawing pipe.
5. Make all splices and E.C.V. connections using 3M DBY & DBR connectors or similar UL listed dry splice method.
6. Install all control wire splices not occurring at control valve in a separate Carson Industries Model #910-10 body with 910-4 bolt down T-cover wire splice valve box with branded with WS in 1" high letters minimum.
7. Install one control wire for each control valve.
8. Run five (5) spare #14 AWG UFUL control wires and one (1) spare common wire from controller pedestal to the end of each and every leg of mainline. Label spare wires at controller and wire stub box.

F. High Voltage Wiring for Automatic Controller:

1. Provide 120 volt power connection to automatic controller.
2. All electric work shall conform to local codes, ordinances, and authorities having jurisdiction. All high voltage electrical work shall be performed by licensed electrician.

G. Installation of Valves:

1. Electric Control Valves: Install electric control valves as detailed on the Drawings.
2. Quick Coupling Valves: Install quick coupling valves as detailed on the Drawings.
3. Drain Valves: Install manual drain valves as detailed on the Drawings.
4. Install manual drain valves at all low points in pressure supply line, whether indicated on the drawing or necessitated by actual conditions, to ensure proper drainage of the mainline.
5. Isolation/Gate Valves: Install as detailed in locations shown on Drawings.
6. Valve Boxes: Install one valve box for each type of valve installed as detailed. Install gravel compaction and leveling bed after compaction of subgrade and prior to setting of valve box.
 - a. Install valve boxes flush with finish grade and square to adjacent surface features.
 - b. When valve boxes are grouped together, allow at least 24 inches between valve box sides.
 - c. Cutting of valve box to give clearance for piping or valves will not be allowed.

7. Backflow Prevention Device: Contractor must meet all applicable laws, rules and codes, including but not limited to Uniform Building codes, Plumbing Codes and State Water Regulations. Assemblies must be installed per the manufacturer's specifications. Backflow devices shall not be installed within the public right-of-way.
 - a. Install in strict accordance with current requirements of Denver Water. Connections to the Denver Water System are to have an approved assembly for the type protection they provide, either isolation or containment.
 - b. Successful Testing of backflow assembly by a certified Backflow Prevention Assembly Tester is Contractor's responsibility. Test reports shall be forwarded to Denver Water in accordance with the State of Colorado regulations. Copies of the report, the tester's certification and the certification of the testing equipment used are to be forwarded to Parks Project Manager.
 - c. Request for final payment will not be certified or processed until certification reports have been filed with Denver Water and received by Parks Project Manager.

H. Installation of Sprinkler Heads:

1. Install sprinkler heads where designated after Parks Project Manager has approved Staking. Set to finish grade as detailed.
2. Spacing of heads shall not exceed the maximum indicated on Drawing unless re-staked as directed by Parks Project Manager. In no case shall the spacing exceed maximum recommended by manufacturer.
3. Install gear driven heads on swing-joint risers as detailed. Angled nipple relative to non-pressure line shall be no more than 45 degrees or less than 10 degrees.
4. Install pop-up heads on swing pipe as detailed.
5. 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. Parks Project Manager may request nozzle changes or adjustments without additional cost to the City.

I. Backfilling:

1. Do not begin backfilling operations unless authorized by Parks Project Manager and all required systems tests have been completed. Backfilling shall not be done in freezing weather unless authorized by Parks Project Manager. Leave trenches slightly mounded to allow for settlement after backfilling is completed. Trenches shall be finish graded prior to walk-through of system by Parks Project Manager.
2. Materials - Excavated material is generally considered satisfactory for backfill purposes. Backfill material shall be free of rubbish, vegetable matter, frozen materials, and stones larger than 1 inch in maximum dimension. Do not mix subsoil with topsoil. 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.
3. Do not leave trenches open for a period of more than 48 hours. Open excavations shall be protected in accordance with OSHA regulations.
4. Compact backfill to 90% S.P.D., determined in accordance with ASTM D698

utilizing the following methods in landscape areas:

- a. Mainline Pipe: Backfill in three uniform lifts and hydraulically compact the first lift and mechanically compact the second and third lifts.
- b. Secondary Pipe: Backfill in two uniform lifts and hydraulically or mechanically compact each.
- c. Puddling or ponding and/or jetting is prohibited within 20 feet of building or foundation walls.

J. Sleeving:

1. Sleeving shall be installed at mainline or lateral pipe depth.
2. Provide for a minimum cover of 24 inches between the top of the sleeve and the bottom of the aggregate base for all pressure and non-pressure piping installed under asphaltic concrete or concrete paving.
3. Sleeving located under areas where asphalt or concrete paving will be installed shall be bedded with sand (a layer 6" below pipe and 6" above pipe).
4. Compact backfill material in 6" lifts at 95% S.P.D. determined in accordance with ASTM D698 using manual or mechanical tamping devices under pavement.
5. Sleeving under existing walks or concrete pavement shall be done by directional boring. Where cutting or breaking of walks and/or concrete is necessary, it shall be done and replaced at no cost to the City. Obtain permission to cut or break walks and/or concrete from Parks Project Manager.
6. Set in place, cap and pressure test all piping under paving, in presence of Parks Project Manager prior to backfilling and paving operations.
7. Sleeve Size Requirements for wire and pipe (control wire shall be placed in sleeving separate from pipe sleeving):
 - a. $\frac{3}{4}$ "-1 - 1/4" Pipe: 2" PVC (1)
 - b. 1-1/2" - 2" Pipe: 4" PVC (1)
 - c. 2-1/2" - 3" Pipe: 6" PVC (1)
 - d. 4" Pipe: 8" PVC (1)
 - e. 1-25 Control Wires: 2" PVC (1)
 - f. 26-50 Control Wires: 3" PVC (1)

K. Automatic Control System:

1. Sentinel Central Control:
 - a. Contractor is to arrange and pay for C.P.S. Distributors to conduct a signal test and survey to maximize signal quality of any antenna and each Sentinel controller installed, and maximize layout for flow sensing. Contact Brandon Gully, C.P.S. Site Survey is to be conducted or verified prior to construction during summer full tree leaf-out. Design is based on field test. Contractor is responsible to coordinate optimization of central control with Toro and C.P.S.
2. Install controller and controller enclosure in accordance with the Drawings and with the manufacturer's instructions. Concrete pad, 120v electrical power, conduits, grounding and control wire connections to terminal surge strips shall be by contractor.
3. Provide controller to earth ground as per manufacturer recommendation. Central Control Satellite: Provide controller to earth ground in accordance with Article 250 of the National Electrical Code (NEC). Earth ground shall be 10 OHMS or less as measured by a Megger® or similar instrument, or as per manufacturer

recommendation. Contractor shall arrange and perform testing in presence of Denver Parks and Recreation representative or consultant.

- a. Ground rods are to have a minimum diameter of 5/8" and a minimum length of 8 feet. Copper wire shall be connected to the ground rod by the installer using a Cadweld GR1161G "One-Shot Plus" welding kit.
4. Install above ground wiring in rigid conduit in accordance with applicable codes.
- L. Coordinate installation with electrical work to insure electrical power supply line(s) are provided to controller location(s).
- M. Wire control valves in a logical zone sequence.
 1. Permanently engrave date of installation and Xcel service pole number inside controller enclosure.
- N. Miscellaneous Items:
 1. Rain Sensor: Install in accordance with manufacturer's instructions, located as per Drawing.

3.4 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 5 minutes through furthest valves. Cap risers after flushing.
- B. Testing pressurized mainline: Conduct tests in presence of Parks Project Manager. Arrange for presence of Parks Project Manager 48 hours in advance of testing. Supply force pump and all other test equipment.
 1. Set in place, cap and pressure test all piping under paving, in presence of Parks Project Manager prior to backfilling and paving operations.
 2. After backfilling and installation of all control valves, fill pressure supply line with water, and pressurize to 40 PSI over the designated static pressure or 120 PSI, whichever is greater, for a period of 2 hours.
 3. Leakage, Pressure Loss: Test is acceptable if less than 2 pounds of pressure is evident during the test period.
 4. Leaks: Detect and repair leaks. Replace defective PVC pipe with new full length pipe section. No pipe splices will be accepted within pipe sleeve. No PVC pressure couplings or slip-fix repair couplings will be allowed.
 5. Retest system until test pressure can be maintained for duration of test.
 6. Before final acceptance, pressure supply line shall remain under pressure for a period of 48 hours with no evidence of leaks or failures.
- C. Testing Controller Operations:
 1. Functional test of the control system shall be performed and demonstrate that all parts of the control system function as specified or intended, as per Parks **Central Control Certification Checklist**. The functional test for each system shall consist

of not less than 30 days of continuous, satisfactory operation of the complete system serviced by a controller.

2. Any materials determined to be faulty as part of the installation shall be replaced or corrected by the Contractor at his expense in a manner respective to the Plans, Details and other sections of this Specification. In the event of a system failure due to faulty installation, programming or workmanship, the 30 day period will be repeated until testing is complete.

D. System Operations Orientation:

1. System Operation Training Session: A training and orientation session for Parks staff shall be required.
 - a. The Contractor, the irrigation subcontractor, a representative of the manufacturer or distributor, and representatives of Parks maintenance and Water Conservation shall be present. The date and time of the session and attendees present shall be subject to approval by a Parks representative.
 - b. The completed Record Drawings, Controller Zone Maps and Controller Program Schedule shall be reviewed for approval by Parks Water Conservation Unit.
 - c. Controller features, flow sensing, alarms and programming will be reviewed.
 - d. Hand held operation of field units will be demonstrated.

E. Walk-Through for Substantial Completion:

1. Arrange for Parks Project Manager's presence 48 hours in advance of walk-through.
2. Entire system shall be completely installed and operational and trenches shall be finish graded prior to scheduling of walk-through.
3. Electrically operate each zone in its entirety for Parks Project Manager at time of walk-through. Project inspection by Parks Project Manager shall include:
 - a. Review operation, coverage, head/nozzle adjustment, and system adjustment per specifications.
 - b. Open all valve boxes to confirm materials, gravel bedding, compaction, elevation, workspace access within boxes, clearance from lid and bedding, locking mechanisms, and zone branding. Interior of boxes should be free of visible soil. All valves must be tagged with zone identification and valve box lids must be branded with zone valve identification. Verify connections in all zone valve and wire splice boxes.
 - c. Contractor shall resistance test all spare common and hot wires for continuity in the presence of Parks Project Manager.
 - d. Confirm irrigation heads are at specified elevation and distance from paved surfaces and curbs, plumb and soil compacted.
 - e. Inspect concrete size and elevation of pads for backflow assemblies, master valves, and enclosure pads. Confirm quality of concrete, finish, access, spare conduit/sleeving as required for wiring.
 - f. Confirm quality of controller enclosure and mounting (there must be no gap between controller and concrete), grounding, high voltage installation, low voltage wiring, ID tagging of wires in controller, and

- communication set up. Each controller must have a color-coded zone chart and programming chart as per specifications.
 - g. Contractor shall submit written certification for testing that proper grounding for all controllers has been installed to Owner.
 - h. Review trench and related excavation repair including backfill, compaction, fine grade, seed and sod installation.
 - i. Review appropriate use of purple valve lids and other product as required for reuse water applications.
4. Certify Central Control Operation: Central control operation will be verified by Parks Certification of Central Control Checklist.
- a. Generate a punch list of items to be corrected prior to Final Completion.
 - b. Furnish all materials and perform all work required to correct all inadequacies of coverage due to deviations from Contract Documents.

F. Walk-Through for Final Completion:

1. Arrange for Parks Project Manager's presence 48 hours in advance of walk-through.
2. Show evidence to Parks Project Manager that the City has received all accessories, charts, record drawings, and equipment and backflow certification reports and controller grounding assembly certificates as required before Final Completion walk-through is scheduled.
3. Operate each zone, in its entirety for Parks Project Manager at time of walk-through to insure correction of all incomplete items.
4. Items deemed not acceptable by Parks Project Manager shall be reworked to complete satisfaction of Parks Project Manager.
5. If after request to Parks Project Manager for walk-through for Final Completion of irrigation system, Parks Project Manager finds items during walk-through which have not been properly adjusted, reworked, or replaced as indicated on punch list from previous walk-through, 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 by Parks Project Manager to conduct and document further walk-through meetings as deemed necessary to ensure compliance with Contract Documents.

3.5 ADJUSTING:

- A. Upon completion of installation, "fine-tune" entire system by regulating valves, adjusting patterns and break-up arms, 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 +/- 7%.
- B. If it is determined that irrigation adjustments will provide proper coverage and improved water distribution as determined by the Parks Project Manager, Contractor shall make such adjustments prior to Final Acceptance as directed, at no additional cost to the City. Adjustments may also include changes in nozzle sizes, degrees of arc, and control valve throttling.
- C. All sprinkler heads shall be set perpendicular to finish grade unless otherwise designated.

- 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.
- 3.6 CLEANING - Maintain continuous cleaning operation throughout duration of Work. Dispose of, off-site at no additional cost to the City, all trash, excess soil or debris generated by installation of irrigation system.

END OF SECTION 02810

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1-Specification sections, apply to work of this section.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Chain link fencing as shown on the drawings.
- B. Drawings and general provisions of the Construction Contract, and Division-1 Specification sections apply to work of this section.

1.3 SUBMITTALS

- A. Submit manufacturer's technical data, and installation instructions for metal fencing.

1.4 QUALITY ASSURANCE

- A. Provide chain link fences as complete units produced by a single manufacturer including necessary erection accessories, fittings, fastenings and gates.
- B. Except where higher standards are indicated conform to "Product Manual" published by CLMFI for materials and ASTM F567 for installation.

PART 2 - PRODUCTS

2.1 STEEL FENCING

- A. Fence Fabric: No. 9 ga. Galvanized (0.148") steel wires, 2" mesh, with both selvages knuckled.
 - 1. Furnish one-piece fabric widths for fencing up to 12' high.
 - 2. Fabric finish, galvanized, ASTM A392, Class I, with not less than 1.2 oz. zinc per sq. ft.
- B. Framework: Galvanized steel, ASTM A120, with not less than 1.8 oz. zinc per sq. ft. for galvanized fence. Powder coat fence framework 5 mils thickness. Color to be dark green.
- C. Hardware and Accessories: Galvanized, ASTM A153, with zinc weights per Table I for galvanized fence.

2.2 FRAMING AND ACCESSORIES

- A. Space as shown on plans and sections.
- B. Posts

1. End, corner and pull posts
 - a) Schedule 40, 2.875" O.D. minimum for up to 8'-0" height
 - b) Schedule 40, 3.5" O.D. minimum for posts to 10' height
2. Line posts: Schedule 40, 2.375" O.D. minimum
3. Gate Posts
 - a) Single gates: Schedule 40, 2.875" O.D. minimum
 - b) Double gates: Schedule 40, 3.5" O.D. minimum
4. Post caps
 - a) Line posts: Weather tight closure caps with opening for top rails
 - b) Terminal posts: Weather tight closure caps

C. Rails

1. Minimum 1.66" O.D., Schedule 40.
2. Expansion sleeves are prohibited unless approved by DPS Project Manager.
3. Provide bottom rails at backstop and on backstop wings.
4. Intermediate rails are required for fences over 4'-0" in height.

D. Gates

1. Perimeter frame: 1.90" O.D. minimum, Schedule 40
2. Weld corners of frames and touch-up weld spots with black coating.
3. Hardware
 - a) Commercial grade
 - b) Hinges
 - i) Non-lift off
 - ii) 180 degree swing
 - iii) One pair (minimum) up to and including 6'-0" height
 - iv) One and one-half pair (minimum) on gates over six feet 6'-0" height
 - v) Weld in place. Bolt or screw attachment of hinges is prohibited.
 - c) Latches
 - i) Padlock eye
 - ii) Operation either side
 - iii) Single gate: Fork type
 - iv) Double gate: Cane bolt/drop pin assembly mounted to gate, vertical frame, designed to engage strike/ground sleeve that is embedded 18" minimum in concrete (inactive leaf)
 - v) Weld in place. Bolt or screw attachment of latches is prohibited.
 - d) Cantilever gates
 - i) Solid track wheels, cast iron
 - ii) 2 3/8" Minimum O.D. Rail / Frame, Schedule 40
 - iii) 4" minimum support posts
 - iv) If gate is in play area, provide a protective shield over the rollers.

E. Accessories

1. Truss rods: 3/8" diameter with turnbuckle and post anchors
2. Tension bar: Full height, 1/4" x 3/4" (minimum)
3. Tension clamps: 14 gauge x 1" (minimum)
4. Tension wire: 9 gauge (minimum)
5. Tie wires: 12 gauge (minimum)

- F. Concrete
 - 1. Portland cement, ASTM C150; aggregates, ASTM C33; and clean water
 - 2. Mix materials to obtain concrete with a minimum 28-day compressive strength of 3000 psi.
 - 3. Mix shall use at least five (5) sacks of cement per cubic yard and 1" maximum size aggregate.
 - 4. Mix shall have a maximum slump of three inches (3") and between 2% and 4% entrained air.
- G. Post Brace Assembly: Manufacturer's standard adjustable brace at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric.
- H. Use. 1.66" OD pipe for horizontal brace.
- I. Stretcher Bars and Bands: One piece stretcher bars in lengths equal to full height of fabric, with minimum cross-section of 0.188" x 0.75". Provide one stretcher bar for each gate and end post, and 2 for each corner and pull post, except where fabric is integrally woven into post.
- J. Space stretcher bar bands not over 12" o.c., to secure stretcher bars to end, corner, pull, and gate posts. All backstop tension bands to be 1/8" x 1" heavy duty.
- K. Refinishing: Following any damage to post coating, immediately refinish with two coats of plastic coating or rustolium to match original finish.
- L. Gate Accessories: Industrial malleable ball and socket hinge. Malleable gate fork latch for man gates. Industrial latch pressed steel latch assembly for double gates including plunger rod. Industrial gate ells.
- M. Windscreen (Montclair): Douglas Poly-Prot OMPGR Windscreen, 100% polypropylene open weave or approved equal. Color green.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Do not begin installation and erection before final grading is completed, unless otherwise permitted.
- B. For fencing attached to concrete, do not begin work before these materials have been completed, cured and have attained their design strengths.
- C. Excavation: Drill holes for post foundations of diameters and spacing shown, in firm, undistributed or compacted soil.
- D. Post Spacing:
 - 1. General: 10' on center (maximum). All rolling gates: 5" on center (maximum).
 - 2. Include composite lumber on field side of backstop fence (Trex type).
- E. Post foundations:

1. Concrete shall be used for post foundations. The depths listed below are minimum embedment depth of the fence post in concrete for fences without wind screens. The foundation depth shall provide an additional 6" of concrete below the embedment depth.
 - a) 4' & 6' Fence Heights: Minimum 10" diameter by 3'-0" deep.
 - b) 12' Fence Heights: Minimum 18" diameter by 3'-0" deep.
 - c) 18' Fence Heights: Minimum 24" diameter by 4' deep.
 - d) 24' Fence Heights: Minimum 24" diameter by 6' deep.
- F. Gates and other access locations
1. Clear opening <5'-0", single gate
 2. Clear opening , 10'-0" and > 5'-0", double gate
 3. Clear opening 2/3-1/3 gate – vehicle/pedestrian combo gate.
 4. The type of gate or vehicle barrier structure for any access opening in excess of 10' shall be coordinated with the DPS Project Manager. Avoid larger openings wherever possible. Preliminary gate types are as follows:
 - a) Clear opening < 20'-0" and > 10'-0", rolling gate
 - b) Clear opening > 10'-0", cantilever gate
- G Framework: Setting Posts: Center and align posts in holes 3" above bottom of excavation.
- H. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations. Bring top elevation of concrete to 5" below pavement grade except where otherwise shown and trowel smooth with wash away from post.
- I. Pour curb or mow strip to grade indicated. Trowel smooth. Clean posts. Cut one perpendicular control joint to the center of each post.
- J. Top Rails: Run rail continuously through post caps. Use of couplings is acceptable.
- K. Center Rails: Provide center rails only where shown. Install in one piece between posts and flush with post on fabric side, using special offset fittings where necessary.
- L. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.
- M. Fabric: Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, or on the active side for playfields, and anchor to framework so that fabric remains in tension after pulling force is released.
- N. Stretcher Bars: Thread through or clamp to fabric 4" o.c., and secure to posts with metal bands spaced 12" o.c.
- O. Tension Bar Clamps: 15" o.c. (maximum).
- P. Truss Rods: Provide at all terminations and changes in directions, from top of nearest line post to bottom of terminal or corner post.

- Q. Tie Wires: Use U-shaped wire, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least 2 full turns. Bend and put wire to minimize hazard to persons or clothing. Leave no ends exposed past fabric thickness. Line Posts: 12" o.c. (maximum). Rails: 24" o.c. (maximum).
- R. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts; file smooth.
- S. Tension Wire:
1. Tension wire shall be secured with hog rings at 24 o.c. minimum in all applications.
 2. All fencing fabric: Continuous length (no splices permitted), secured with hogs rings to fabric at 2nd diamond, 4" from bottom.
 3. Fencing over 4'0" in height; additional tension wire, continuous length, secured with hog rings to fabric at 2'-0" above bottom of fabric. Hog rings should be closed with hog ring pliers to ensure there is no overlap with exposed, sharp edges.
 4. Backstops: Continuous length, secured with hog rings to fabric at bottom, 18" and 36" above bottom.
 5. Continuous welded pipe may be used in lieu of tension wire.
- T. Remove sharp edges and protrusions.

END OF SECTION 02831

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division - 1 Specification sections apply to work of this section.
- 1.2 SUMMARY:
- A. Work Included: Furnishing and installing sand for volleyball.
 - B. Furnishing and installing Infield mix
 - C. Related Work:
 - 1. Earthwork – Section 02200
- 1.3 SUBMITTALS
- A. Submit 1 cubic foot sample of sand and infield mix material at least one week prior to delivery to the site.

PART 2: PRODUCTS

- 2.1 VOLLEYBALL SAND
- A. New volleyball sand shall be washed concrete sand conforming to the requirements of ASTM 33. Any reused sand shall be clean and free of dirt and debris.
 - B. “Pro Red” infield mix, with stabilizer, available from Golf and Sport Solutions; contact is Jack Wehl and he can be reached at (C) 303.961.0141. Submit a sample for approval. Install at 4” depth.
- 2.2 SOIL SEPARATOR FABRIC:
- A. Geotextile fabric shall be Mirafi 140 N or approved equal.

PART 3: EXECUTION

- 3.1 INSTALLATION OF SAND SURFACING:
- A. Subgrade shall be firmly compacted, pitched to drain and approved by the Project Manager prior to installation of the playground sand.
 - B. Install specified geotextile fabric over compacted subgrade, overlapping fabric edges by 6” minimum.

- C. Place sand loosely over the fabric and spread to level, maintaining a minimum 12” depth. Allow 3” for settlement.

3.2 CLEAN UP

- A. Maintain a neat and orderly work site at all times.
- B. Upon completion of site work, clean up area, remove tools, equipment, materials and debris.

END OF SECTION 02865

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Preparation of soil for the purpose of seeding, sodding or planting operations. Soil preparation consists of ripping, fertilizing, soil conditioning and fine grading the topsoil. Soil preparation as specified herein MUST precede all sodding and planting.
 - B. Related Work:
 - 1. Topsoil – Section 02925
 - 2. Turfgrass Seeding – Section 02932
 - 3. Native Seeding – Section 02933
 - 4. Sodding – Section 02935
 - 5. Trees and Shrubs - 02950
- 1.3 SUBMITTALS:
- A. Quality Control Submittals:
 - 1. Certificates: State, federal and other inspection certificates shall accompany invoice for materials showing source or origin. Submit to Owner prior to acceptance of material.
 - 2. Material Analysis: Provide soil conditioner analysis performed no more than 3 months prior to delivery to site.
- 1.4 DELIVERY, STORAGE AND HANDLING:
- A. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, bearing name and warranty or producer.
 - B. Notify Owner of delivery schedule in advance so material can be inspected upon arrival at project site. Immediately remove unacceptable material from project site.
- 1.5 PROJECT/SITE CONDITIONS:
- A. General: Do not perform work when climate and existing site conditions will not provide satisfactory results.
 - B. Vehicular accessibility on site shall be as directed by the Owner. Repair damage to prepared ground and surface caused by vehicular movement during work under this section to original condition at no additional cost to the City.

PART 2: PRODUCTS

2.1 SOIL MATERIALS:

- A. Topsoil: Shall be as specified under Section 02925 - Topsoil.
- B. Soil Conditioner:
 - 1. Composted material shall consist of aged organic matter, free of weed or other noxious plant seeds, lumps, stones, or other foreign contaminants harmful to plant life, and having the following characteristics based on a nutrient test performed no longer than 3 months prior to its incorporation into the project:
 - a. Organic matter: 25% minimum.
 - b. Salt content: 3.0 mmhos/cm maximum with a 1:5 dilution.
 - c. pH: 5.5 to 8.3.
 - d. Carbon to nitrogen ratio less than 20:1.
 - 2. Mountain peat, aspen humus, gypsum and sand will not be accepted.
 - 3. Acceptable product: Class I compost, such as Ecogro or Bio-comp, as produced by A1 Organics, Eaton, CO, or approved equal.

2.2 FERTILIZER:

- A. General:
 - 1. Fertilizer shall conform to applicable State fertilizer laws. It shall be uniform in composition, dry, and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Fertilizer that has become caked or damaged will not be accepted.
- B. Turf Grass Lawns:
 - 1. Diamonium phosphate (18-46-0). Nitrogen shall be composed of sulphur-coated Urea only. Provide in sufficient quantity to apply at the rate of 100 lbs. nitrogen per acre, unless otherwise indicated by the soils tests.
- C. Native Grass Areas:
 - 1. No fertilizer shall be applied to native grass areas.

2.3 HERBICIDE:

- A. Post Emergent Herbicide: Roundup (Glyphosate) as manufactured by Monsanto Company or approved equal.

PART 3: EXECUTION

3.1 EXAMINATION:

- A. General: Verify that existing site conditions are as specified and indicated before beginning work under this Section.

1. Grades: Inspect to verify rough grading is within +/- 0.1 foot of grades indicated and specified.
 2. Damaged Earth: Inspect to verify that earth rendered unfit to receive planting due to concrete, water, mortar, limewater or any other contaminant dumped on it has been removed and replaced with clean earth from a source approved by the Owner.
- B. Unsatisfactory Conditions: Report in writing to General Contractor with copy to Owner.
- C. Acceptance: Beginning of installation means acceptance of existing conditions by installer.

3.2 PREPARATION

A. Areas of Newly Placed or Existing Topsoil:

1. Protection:
 - a. Locate sewer, water, irrigation, gas, electric, phone and other pipelines or conduits and equipment prior to commencing work.
 - b. Be responsible for proper repair to landscape, utilities, walls, pavements and other site improvements damaged by operations under this section.
2. Weed Control: Remove annual weeds by tilling. Remove perennial weeds by applying herbicide 1 week before soil preparation and as needed, but no sooner than 3 months before beginning work. Water prepared soil to encourage weed germination two weeks prior to applying herbicide.
3. Surface Grade: Remove weeds, debris, clods and rocks larger than 1". Dispose of accumulated debris at direction of Owner.
4. Runoff: Take measures and furnish equipment and labor necessary to control the flow, drainage, and accumulation of water. Insure that all excess water will run off the grades or will percolate within 12 hours.
5. Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site throughout duration of work.
6. Soil Testing: Unless otherwise specified in the Contract, the Contractor shall be responsible for performing horticultural soil tests on a minimum of 4 current soil samples for each source of topsoil to be used in the project. Reference Section 02925 – Topsoil, Paragraph 1.3, for soil analysis report information. Soil test will be used to determine the type and amount of soil organic amendment and fertilizer to be applied prior to seeding and sodding. Locations for testing shall be approved by the Owner.
7. Timing: Perform soil preparation just prior to planting operations and in accordance with final planting schedule. Coordinate with irrigation system installation to avoid damage to work of one by the other.

B. Areas of Compacted Topsoil:

1. If the existing area has turf that is sparse, stunted, anemic, weedy or was used as a construction staging and/or parking area and/or subjected to heavy visitor use, it is likely that the soils are compacted and will require ripping and/or shatter aeration to prepare the soil for revegetation. Scarify compacted soil to a 6-inch depth to loosen and bond topsoil to subsoil.

- C. Areas of Disturbed Topsoil:
 - 1. If the areas are disturbed but not severely compacted, shattering for aerification alone should be sufficient to prepare the soil for revegetation.
- D. Areas of Undisturbed Natural Topsoil:
 - 1. Undisturbed sites that are or were supporting healthy plant growth need only surface seedbed preparation prior to sowing seed.

3.3 INSTALLATION

- A. Soil Preparation in Turf Grass Areas:
 - 1. Apply amendments at the following rates:
 - a. Soil conditioner: 4 cubic yards per 1000 square feet
 - b. Diamonium phosphate: 2 lbs. of nitrogen per 1000 square feet
 - 2. After applying soil conditioner and fertilizer, thoroughly till area to depth of 6" minimum by plowing, harrowing, or disking until soil is well pulverized and thoroughly mixed.
- B. Soil Preparation in Perennial / Shrub beds.
 - 1. Apply soil conditioner at the rate of 4 cubic yards per 1000 square feet.
 - 2. After applying soil conditioner, thoroughly till area to depth of 6" minimum by plowing, harrowing, or disking until soil is well pulverized and thoroughly mixed.
- C. Fine Grading in all Landscape Areas:
 - 1. Do fine grading for all areas prior to seeding or planting. Allow for natural settlement.
 - 2. For ground surface areas surrounding buildings to be landscaped, maintain required positive drainage away from buildings.
 - 3. Establish finish grades to within 0.05 foot of grades indicated, in order to prevent "bird-baths" or ponding.
 - 4. Finish grade to be below edge of pavement prior to sodding, seeding or planting.
 - a. Sodded Areas: Allow 1-½" for sod.
 - b. Shrub Beds: Allow 4" for mulch.
 - 5. Noxious weeds or parts thereof shall not be present in the surface grade prior to seeding.
 - 6. Compaction of Surface Grade Prior to Landscape Installation: Firm, but not hard (85% standard Proctor density within 2% optimum moisture).
 - 7. Hand Raking:
 - a. Turfgrass Lawn Areas: Prior to acceptance of grades, hand rake to smooth, even surface, free of debris, clods, rocks and vegetable matter greater than ½ inch.
 - b. Native Seed Areas: Area shall not be raked smooth but left in a uniform condition after tilling. Rough raking may occur parallel to the contours only.

8. Restore planting areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

3.4 NOTIFICATION AND INSPECTION

- A. Inspection: Provide notice to Owner requesting inspection at least seven (7) days prior to anticipated date of completion.
- B. Deficiencies: Owner will specify deficiencies to Contractor who shall make satisfactory adjustments and shall again notify Owner for final inspection.

3.5 CLEANING

- A. General: Remove debris and excess materials from site. Clean out drainage inlet structures. Clean paved and finished surfaces soiled as a result of work under this Section, in accordance with direction given by Owner.

3.6 PROTECTION

- A. General: Provide and install barriers as required and as directed by Owner to protect completed areas against damage from pedestrian and vehicular traffic until acceptance by City.

END OF SECTION 02920

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Includes: Furnishing, stockpiling and placing topsoil on a previously prepared subgrade.
 - B. Related Work:
 - 1. Soil Preparation and Fine Grading – Section 02920
 - 2. Sodding – Section 02935
 - 3. Trees and Shrubs – Section 02950
- 1.3 QUALITY ASSURANCE: Submit soil analysis report for imported 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, % organic matter, and soluble salts (electric conductivity in millimos/centimeter), and shall include additive recommendations. Testing will be at the expense of the Contractor.
- 1.4 DELIVERY, STORAGE AND HANDLING: Do not deliver or place topsoil in frozen, wet, or muddy condition.

PART 2: PRODUCTS

- 2.1 ON-SITE TOPSOIL: Topsoil previously stripped and stockpiled prior to earthwork operations.
- 2.2 IMPORTED TOPSOIL: All topsoil shall be a loam or sandy loam. At least 10 days prior to topsoil delivery, notify Owner of the source(s) from which topsoil is to be furnished. Topsoil shall be furnished by the Contractor and shall be a natural, friable soil representative of productive soils in the vicinity. It shall be obtained from the top 12" of well drained areas.
- A. Fertile, friable, loamy soil, reasonably free from subsoil, refuse, roots, heavy or stiff clay, stones larger than 1 inch, coarse sand, noxious seeds, sticks, brush, litter, and other deleterious substances; suitable for the germination of seeds and the support of vegetative growth. The pH value shall be between 7.0 and 8.0.
 - B. Soil Texture: Sand, 30 to 50 percent; silt, 30 to 50 percent; clay, 5 to 30 percent.
 - C. Additives: As determined by soil fertility tests.
 - D. % Organic Content: 2.9% minimum.
 - E. Soluble Salts: Electric conductivity shall be less than 3.3 mmhos/cm for dryland areas and less than 5.1 mmhos/cm for irrigated lands.

PART 3: EXECUTION

3.1 PLACING TOPSOIL:

- A. Scarify compacted subgrade to a 6-inch depth to bond topsoil to subsoil. Place topsoil to a minimum depth of 4-inches after settlement. Topsoil shall be free from weeds, sod, clods and stones larger than 1-inch, toxic substances, litter or other deleterious material. Spread evenly and grade to elevations and slopes shown. Hand rake areas inaccessible to machine grading.
- B. Utilize salvaged topsoil as the top layer to the extent available. If sufficient on-site material is not available, the Contractor shall furnish and install imported topsoil in the manner described above.

END OF SECTION 02925

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Installation of turfgrass lawns, hydromulch, and maintenance until Final Acceptance.
 - B. Related Work:
 - 1. Irrigation System - Section 02810
 - 2. Soil Preparation - Section 02920
 - 3. Topsoil - Section 02925
 - 4. Trees and Shrubs - Section 02950
- 1.3 REFERENCES:
- A. Reference Standards: Comply with U.S. Department of Agriculture Rules and Regulations under Federal Seed Act, and be equal in quantity to standards for Certified Seed.
- 1.4 SUBMITTALS:
- A. As specified in Section 01300.
 - B. Submit seed vendor's certification for required grass seed mixture, indicating percentage by weight, and percentages of purity, germination and weed seed for each grass species.
 - C. Contract Closeout Submittals:
 - 1. Operating and Maintenance Data: At completion of work, submit 3 copies in accordance with Section 01700. 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 Seed Areas: At completion of work, furnish written warranty to City based upon requirements as specified.
- 1.5 DELIVERY, STORAGE AND HANDLING
- A. Seed: Deliver seed materials in original unopened containers, showing weight, analysis and name of supplier. Store in a manner to prevent wetting and deterioration.
 - B. 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.

- C. Material will be inspected upon arrival at project site.
- D. Immediately remove unacceptable material from job site.

1.6 PROJECT/SITE CONDITIONS

- A. Existing Conditions: Vehicular accessibility on site shall be as directed by Project Manager. Repair damage to prepared ground and surfaces, caused by vehicular movement during work under this section, to original condition at no additional cost to the City.
- B. Environmental Conditions: Do not drill or sow seed during windy weather or when ground is frozen or otherwise untillable.

1.7 WARRANTY:

- A. Warranty for Turfseed Areas: Warrant areas in seed to be in a healthy, vigorous growing condition, and for consistency and completion of coverage for a period of one year from date of final acceptance as a full stand of grass. After time of seed germination, re-seed any spots where seed has not germinated within the total seeded area. Continue this procedure until a successful stand of grass is growing and accepted by the Project Manager.
 - 1. During the original warranty period, reseed 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. Reseeding will not be required in any season definitely unfavorable for seeding.
 - 3. Reseed in a manner to achieve quality as originally specified.

1.8 MAINTENANCE:

- A. General: The maintenance period shall begin immediately after each area is seeded and continue until Final Acceptance of entire project or a minimum of 90 days, whichever is longer. Final Acceptance of seeded areas will not be given until Project Manager is satisfied with germination and a full stand of grass is in a vigorous growing condition, with consistency and completion of coverage. During this time, be responsible for watering, mowing, spraying, weeding, fertilizing and all related work as necessary to ensure that seeded areas are in a vigorous growing condition. Provide all supervision, labor, material and equipment to maintain seeded areas. After Final Acceptance, maintenance shall become the responsibility of the City.
- B. The seeded areas shall be accepted on the basis of having a uniform plant growth over the entire seeded area. Two (2) months after seeding, the seeded areas shall be reviewed by the Project Manager and the Contractor. Any areas (as determined by the Project Manager) where the seed has failed to germinate shall be reseeded and raked to cover the seed. In any area where the seed has failed to grow, reseeded shall be at the Contractor's expense until grass is established and accepted. Acceptable uniform plant growth shall be defined as when the scattered bare spots, not greater than 1 square foot, do not exceed 5% of the seeded area.
- C. Materials: Conform to specifications or otherwise be acceptable to the City.

- D. Mowing and Trimming: When turfgrasses reach 3-1/2" height, begin weekly mowing program to maintain turf at 2½-2-3/4" height. Do not remove more than 33% of grass leaf in single mowing. Do not mow when grass is wet. Remove clippings from adjacent paved areas.
- E. Fertilizing: Within 45 days of seeding and every 30 days thereafter until final acceptance, apply specified fertilizer to maintain optimal sod vigor.
- F. Weed Control: Control annual weeds by mowing. Do not use herbicides unless approved by the Project Manager.
- G. Insect and Disease Control: As required, apply insecticide and fungicide approved by the Project Manager.

PART 2: PRODUCTS

2.1 MATERIALS:

- A. Lawn Seed:
 - 1. Fresh, clean and new crop mixture mixed by an approved method.
 - 2. Blend: Kentucky bluegrass (min. 90%) and Perennial ryegrass (max. 10%):
 - a. Include at least three (3) improved Kentucky bluegrass cultivars, each of a different type classification. At least one cultivar shall be an aggressive type. Submit list of proposed varieties to Project Manager a minimum of ten (10) days prior to seeding.
 - b. Application rate: Four (4) lbs. pure live seed (P.L.S.) per 1,000 sq.ft.
- B. Mulch: Wood cellulose fiber suitable for hydromulching, in compliance with CDOT 213.02
- C. Fertilizer: Inorganic mixture with following chemical composition: 20-5-10 with 50% sulfur coated urea (no iron), or as recommended by testing lab.
- D. Water: Free of substances harmful to seed growth. Water will be furnished by City, available through quick coupler or previously installed automatic irrigation system. Hoses and other watering equipment to be furnished by Contractor.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Examine finish surfaces, grades and depth. Do not start seeding work until unsatisfactory conditions are corrected. Perform seeding work only after planting and other work affecting ground surface has been completed.

3.2 PREPARATION:

- A. Work notification: Notify Project Manager at least seven (7) working days prior to start of seeding operations.
- B. Limit preparation to areas that can be seeded immediately.
- C. The Contractor shall prepare the soil of all areas to be seeded in accordance with the requirements of Section 02920 - Soil Preparation.
- D. When completed, the soil shall be firmed by rolling and float dragging, followed by steel raking, to provide for the proper seeded surface. The seed bed shall be totally free from rock or clay clods over one-half (½) inch in diameter.

3.3 INSTALLATION:

- A. Seed immediately after preparation of bed. Seed shall be sown between April 15 and June 1, or between August 15 and October 1. Seeding at other times may only be done if approved by the Project Manager.
- B. Seed disturbed areas within contract limits as described. Areas outside Contract Limits disturbed as a result of construction operations shall be seeded at Contractor's expense.
- C. Seed shall be uniformly sown, (half in one direction and other half at right angles to the first sowing). The direction of the final sowing shall always be at right angle to the slope or running in the direction of the contour. Seed shall be raked to a depth of approximately ½".
- D. Seed shall be drill seeded with approved seeder wherever practicable. Areas that are too small or steep may be hand seeded at twice the specified rate.

3.4 MULCHING:

- A. Mulch Application: Utilize an approved hydromulcher to apply cellulose fiber at a rate of 2000 lbs. per acre.
- B. Mulching shall not be done in the presence of free surface water resulting from rains, melting snow or other causes.
- C. Areas not properly mulched, or damaged due to the Contractor's negligence, shall be repaired and remulched in an acceptable manner at the Contractor's expense. Mulching removed by wind prior to acceptance shall be re-established by the Contractor at his own expense.
- D. The seeded area shall be mulched within 8 hours after seeding. Areas not mulched within 24 hours after seeding must be re-seeded with the specified seed mix at the Contractor's expense.
- E. Contractor shall remove all hydromulch from plant materials, fences, paved areas and other objects as directed by Project Manager.

3.5 FERTILIZING:

- A. Distribute 20-5-10 fertilizer uniformly at the rate of 1 lb. actual nitrogen per 1,000 sq.ft. or 5 lbs of material per 1,000 sq.ft. 45 days after initial seeding operations and every 30 days thereafter until Final Acceptance of project by Project Manager.

3.6 PROTECTION:

- A. Protect existing utilities, paving and other facilities from damage caused by seeding operations
- B. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.
- C. Locate, protect and maintain the irrigation system during seeding operations. Repair irrigation system components during seeding operations at Contractor's expense.

3.7 CLEANING:

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris and equipment. Repair damage resulting from seeding operations.

END OF SECTION 02932

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Installation of native grass seed and specified mulch, netting if applicable, and maintenance of the seeded areas until Final Acceptance.
- B. Related Sections:
1. Irrigation System - Section 02810
 2. Soil Preparation - Section 02920
 3. Topsoil – Section 02925
 4. Trees and Shrubs - Section 02950
- 1.3 REFERENCES:
- A. Reference Standards: Comply with U.S. Department of Agriculture Rules and Regulations under Federal Seed Act and be equal or better in quality than standards for certified seed.
- 1.4 SUBMITTALS:
- A. Quality Control Submittals:
1. Certificates: State or Federal Seed Tags or other inspection certificates shall accompany the invoice for materials showing source or origin. Submit to Project Manager prior to acceptance of the material.
- B. Contract Closeout Submittals:
1. Operating and Maintenance Data: At completion of work, submit 3 copies in accordance with Section 01700. Include directions for irrigation, mowing and spraying as required for continued and proper maintenance through full growing season and dormant period.
 2. Warranty for Native Seed in Irrigated Areas: At completion of work, furnish written warranty to Owner based upon requirements as specified.
- 1.5 QUALITY ASSURANCE:
- A. Source Quality Control:
1. Seed Materials: Subject to inspection and acceptance. Project Manager reserves the right to reject at any time or place prior to acceptance, any work and seed which in the Project Manager's opinion fails to meet specification requirements.
 2. Inspection: Primarily for quality; however, other requirements are not waived even though visual inspection results in acceptance.

3. Inspection will be made periodically during seeding, at completion of seeding and at end of warranty period by Project Manager.
- B. Testing Requirements: Seed and seed labels shall conform to current State and Federal regulations and be subject to testing provisions of the Association of Official Seed Analysis.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in sealed standard containers stating correct name and composition on the outside of the container. Seed damaged in transit or storage will not be accepted.
- B. Material will be inspected upon arrival at project site.
- C. Immediately remove unacceptable material from job site.

1.7 PROJECT/SITE CONDITIONS

- A. Existing Conditions: Vehicular accessibility on site shall be as directed by Project Manager. Repair damage to prepared ground and surfaces, caused by vehicular movement during work under this section, to original condition at no additional cost to the City.
- B. Environmental Conditions: Do not drill or sow seed during windy weather or when ground is frozen or otherwise untillable.

1.8 WARRANTY:

- A. Warranty for Native Seed in Irrigated Areas: Warrant seeded areas to be in a healthy, vigorous growing condition, and for consistency and completion of coverage for a period of one year from date of final acceptance as a full stand of grass. After time of seed germination, re-seed any spots where seed has not germinated within the total seeded area. Continue this procedure until a successful stand of grass is growing and accepted by the Project Manager.
1. During the original warranty period, resow at once with same seed species those areas that have failed to achieve a stand of grass or which in the Project Manager's opinion are unhealthy.
 2. Reseeding will not be required in any season definitely unfavorable for seeding.
 3. Reseed in a manner to achieve quality as originally specified.
- B. Warranty for Native Seed in Non-irrigated Areas: No warranty will be required.

1.9 MAINTENANCE:

- A. General: The maintenance period shall begin immediately after each area is seeded and continue until Final Acceptance of entire project or a minimum of 90 days, whichever is longer. Final Acceptance of seeded areas will not be given until Project Manager is satisfied with germination and a full stand of grass is in a vigorous growing condition, with consistency and completion of coverage. During this time, be responsible for watering, mowing, spraying, weeding, and all related work as necessary to ensure that

seeded areas are in a vigorous growing condition. Provide all supervision, labor, material and equipment to maintain seeded areas. After Final Acceptance, maintenance shall become the responsibility of the City.

- B. Irrigated Areas: The seeded areas shall be accepted on the basis of having a uniform plant growth over the entire seeded area. Two (2) months after seeding, the seeded areas shall be reviewed by the Project Manager and the Contractor. Any areas (as determined by the Project Manager) where the seed has failed to germinate shall be reseeded and raked to cover the seed. In any area where the seed has failed to grow, reseeding shall be at the Contractor's expense until grass is established and accepted. Acceptable uniform plant growth shall be defined as when scattered bare spots, not greater than 1 square foot, do not exceed 5% of the seeded area.
- C. Non-irrigated Areas: The seeded areas shall be accepted on the basis of showing evidence of growth of specified seed material over the entire seeded area within three (3) months of seeding during weather conditions that are favorable for seed germination and growth.
- D. Materials: Conform to specifications or otherwise be acceptable to the City.
- E. Mowing and Trimming: Mow native grasses after the grass has gone to seed, cutting back to not less than 4" height. Remove clippings from adjacent pavement or irrigated turf areas.
- F. Weed Control: Control annual weeds by mowing. Control perennial weeds through use of selective herbicides approved by the Project Manager, only after grass stand has matured sufficiently that it will not be harmed by application of herbicides.

PART 2: PRODUCTS

2.1 MATERIALS:

- A. General:
 - 1. Unless otherwise stated in the Contract, the Contractor shall be responsible for selecting the seed mix to be used on the project based on the soil types and seed mixes outlined under Seed Mixes below. The selected seed mix must be approved by the Project Manager prior to its incorporation into the project.
 - 2. All seed shall be furnished in bags or containers clearly labeled to show the name and address of the supplier, the seed name, the lot number, net weight, origin, the percent of weed seed content, the guaranteed percentage of purity and germination, pounds of pure live seed (PLS) of each seed species, and the total pounds of PLS in the container. All brands shall be free from Colorado prohibited noxious weed seeds as Russian or Canadian Thistle, European Bindweed, Johnson Grass, and Leafy Spurge. The Contractor shall furnish to the Project Manager a signed statement certifying that the seed is from a lot that has been tested by a recognized laboratory for seed testing within six months prior to the date of delivery. Seed that has become wet, moldy or damaged in transit or in storage will not be acceptable.
 - 3. Computation for quantity of seed required on the project is based on Pure Live Seed (PLS). The formula used for determining the quantity of PLS shall be:

Pounds of Seed x (Purity x Germination) = Pounds of PLS. If seed available on the market does not meet the minimum purity and germination specified, the Contractor must compensate for a lesser percentage of purity or germination by furnishing sufficient additional seed to equal the specified product. Product comparison shall be made on the basis of PLS in pounds, stated on each seed bag.

B. Seed Mix:

1. Short Grass Mix (Clay, loam soils)

Common Name	Scientific Name	PLS Full Seed Rate	%	PLS lbs/Acre
Blue Grama	Bouteloua gracilis	3.0	25	0.75
Bottlebrush Squirreltail	Elymus elymoides	15.0	5	0.75
Buffalograss	Buchloe dactyloides	16.0	25	4
Green Needlegrass	Nassella viridula	10.0	5	0.5
Prairie Junegrass	Koeleria cristata	4.0	5	0.2
Sand Dropseed	Sporobolus cryptandrus	0.6	5	0.03
Sideoats Grama	Bouteloua curtipendula	9.0	20	1.8
Western wheatgrass	Pascopyrum smithii	16.0	10	1.6
			100	9.63

Drill Seeded Rate: 9.63 PLS#/Acre
 Broadcast Rate: 19.26 PLS#/Acre
 Small Areas Rate: 38.52 PLS#/Acre

Water: Free of substances harmful to plant growth. Be responsible for furnishing water from underground sprinkler system, quick couplers or other source.

- C. Fertilizer: None required.
- D. Mulch: Comply with CDOT 213.02. Straw mulch shall be a clean grass hay or cereal straw and certified weed free before delivery on site and acceptance. Fifty percent of straw length shall be 10 inches or longer.
- E. Tackifier: Comply with CDOT 213.02.
- F. Erosion Control Blanket: As specified under Section 01565, Erosion and Sedimentation Control.

PART 3: EXECUTION

3.1 EXAMINATION:

- A. Verify that existing site conditions are as specified and indicated before beginning work under this section.

1. Layout: Verify layout of seeding areas as indicated prior to starting seeding operations.
 2. Grades: Inspect to verify that fine grading is within 0.1 foot of grades specified and indicated.
- B. Unsatisfactory Conditions: Report in writing to General Contractor with a copy to the Project Manager.
- C. Acceptance: Beginning of installation means acceptance of existing conditions by this Contractor.

3.2 PREPARATION

- A. Protection:
1. Be responsible for proper repair to landscape, utilities, fences, pavements and other site improvements damaged by operations under this section.
 2. Pay for repairs made by Contractor(s) designated by the City.
 3. Identify prepared seeding areas requiring protection and erect barriers for proper protection and traffic control.
- B. 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.
- C. Seeding Areas: Remove weeds, debris and rocks larger than 1" which may hinder seeding or subsequent operations. Dispose of accumulated debris at direction of the Project Manager.
- D. Fine Grading: Perform as required to maintain positive drainage, prevent ponding and direct run-off into catch basins, drainage structures, etc., and to provide smooth well-contoured surface prior to proceeding. A firm weed-free seed bed is required. Tolerance: ± 0.10 foot.

3.3 SEEDING:

- A. General: Accomplish seeding by a rangeland grass drill with double disk openers and depth bands. Rows of seed shall be at right angles to the slope. Seed shall be sown at a depth of 1/4" to 1/2". Furrows left by drill seeding shall be left in place unless otherwise directed by the Project Manager.
- B. In areas too small or steep to operate a drill and if approved by the Project Manager, seeding may be accomplished by broadcast or hydraulic type seeders at twice the rate specified, at no additional cost to project. Broadcast seed to be raked in at a min. 1/4".
- C. Seeding Seasons
1. Irrigated Areas:
 - a. Spring Seeding: Spring thaw to May 31.
 - b. Summer Seeding: July 15 to August 20.
 - c. Fall Seeding (dormant): October 15 to March 31.

2. Non-irrigated Areas:
 - a. Spring Seeding: Spring thaw to May 31
 - b. Fall Seeding (dormant): October 15 to March 31.

D. Dormant Seeding: Upon approval of the Project Manager, dormant seeding may be accomplished between October 15 and March 31. No seeding shall be done when the ground is frozen, muddy, covered with snow, or otherwise in a condition unsuitable for seeding. Dormant seeding will not relieve the Contractor from any of the warranty or acceptance requirements specified elsewhere in this Section, except that Final Acceptance shall not occur until June 1 at the earliest.

3.4 MULCHING:

- A. Straw Mulch Application: Apply straw mulch at the rate of 4,000 lbs. per acre, crimped into the soil at a right angle to the slope.
- B. In areas too small or too steep for crimping, straw may be spread uniformly on the surface at the specified rate. Apply tackifier in accordance with CDOT 213.03.
- C. Hydromulch Application: Use an approved hydromulcher to apply cellulose fiber at a rate of 2000 lbs/acre. Mulch tackifier shall be applied at 200 lb/acre.
- D. Mulching shall not be done in the presence of free surface water resulting from rains, melting snow or other causes.
- E. Areas not properly mulched, or damaged due to the Contractor's negligence, shall be repaired and remulched in an acceptable manner at the Contractor's expense. Mulching removed by wind prior to acceptance shall be replaced by the Contractor at his own expense.
- F. The seeded area shall be mulched within 24 hours after seeding. Areas not mulched within 24 hours after seeding must be re-seeded with the specified seed mix at the Contractor's expense.
- G. Remove oversprayed mulch immediately from trees, shrubs and sod to prevent damage to same.

3.5 EROSION CONTROL BLANKET: Install erosion control blanket on slopes exceeding 4:1 and in swales or other areas of concentrated runoff. Install in accordance with manufacturer's instructions.

3.6 CLEANING: Remove debris and excess materials from site. Clean paved and finished areas soiled as a result from work under this section, in accordance with direction given by the Project Manager. Clean out drainage inlet structures.

3.7 PROTECTION: At no additional cost to the City, provide and install barriers as required and as directed by the Project Manager to protect seeded areas from damage from pedestrian and vehicular traffic.

END OF SECTION 02933

PART 1: GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Furnish and install bluegrass sod, and maintain sodded areas until Final Acceptance.
 - B. Related Work:
 - 1. Irrigation System - Section 02810
 - 2. Soil Preparation and Fine Grading - Section 02920
 - 3. Topsoil – Section 02925
 - 4. Trees and Shrubs - Section 02950
- 1.3 SUBMITTALS
- A. Quality Control Submittals:
 - 1. Certificates: State, Federal and other inspection certificates shall accompany the invoice for materials showing source or origin. Submit to Owner prior to acceptance of material.
 - 2. At least 10 working days before anticipated date of sod delivery, submit list of varieties contained in sod for approval by Owner.
 - B. Contract Closeout Submittals:
 - 1. Warranty: At completion of work, furnish written warranty to Owner based upon requirements as specified.
- 1.4 QUALITY ASSURANCE
- A. Source Quality Control:
 - 1. Sod Materials: Subject to inspection and acceptance. Owner reserves the right to reject at any time or place prior to acceptance, any work and sod which in the Owner's opinion fail to meet these specification requirements.
 - 2. Inspection: Primarily for quality; however, other requirements are not waived even though visual inspection results in acceptance. Notify Owner of intended sod farm prior to cutting for inspection. Inspection at growth site shall not preclude the right of rejection at project site.
 - 3. Promptly remove rejected sod from site.
 - 4. Inspection will be made periodically during sodding, at completion and at end of warranty period by Owner.
 - B. Sod Standards:

1. General: Healthy, thick turf having undergone a program of regular fertilization, mowing and weed control; free of objectionable 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 entomologist of the State Department of Agriculture.
2. Each piece of Sod: Sandy-loam soil base that will not break, crumble or tear during sod installation.
3. Thickness: Minimum 3/4" thick, excluding top growth and thatch.
4. Thatch: Not to exceed 1/2" uncompressed.
5. Size: Cut in strips 18" wide no more than 24 hours prior to delivery.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Sod: Deliver on pallets properly loaded on vehicles and with root system protected from exposure to sun, wind, and heat in accordance with standard practice and labeled with botanical and common name of each grass species in accordance with Federal Seed Act. Sod that has been damaged by poor handling or improper storage is subject to rejection by the Owner.
 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 48 hours.
 4. Do not stack sod more than 2 feet deep.
- 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.
 1. Material shall be inspected upon arrival at job site.
 2. Immediately remove unacceptable material from job site.

1.6 PROJECT/SITE CONDITIONS

- A. Existing Conditions:
 1. Import and place any fill material required to adjust the fine grade to meet drainage requirements or to match hard surface finish grades.
 2. Vehicular accessibility on site shall be as directed by Owner. Repair damage to prepared grounds and surfaces caused by vehicular movement during work under this section to original condition at no additional cost to Owner.
- B. Environmental Requirements:
 1. If possible install sod between spring and fall: April 15 - October 1 or anytime irrigation is available daily for one month and once a week for several months (especially for fall/winter sodding).
 2. Do not install sod on saturated or frozen soil.
 3. Schedule work for periods of favorable weather. Sod placement on days which, in the opinion of the Owner, are too hot, dry or windy for optimal installation may be prohibited.

1.7 MAINTENANCE

A. Substantial Completion:

1. The Owner will inspect all work for Substantial Completion upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date of inspection.
2. Acceptance of material by the Owner will be for general conformance to specified requirements, and shall not relieve the Contractor of responsibility for full conformance to the Contract Documents.
3. Upon completion and reinspection of all repairs or renewals necessary in the judgment of the Owner, the Owner will recommend that the Work of this Section be provisionally accepted.

B. Maintenance:

1. General: The maintenance period shall begin immediately after each area is sodded and continue until final acceptance of entire project or a minimum of 30 days, whichever is later. During this time, Contractor shall be responsible for watering, mowing, spraying, weeding, aerating, fertilizing, and all related work as necessary to ensure that sodded areas are in a vigorous growing condition. Furnish all supervision, labor, material and equipment to maintain turf areas.
2. Materials: Conform to specification or otherwise be acceptable to Owner.
3. Watering: Initially water sod upon completion of convenient work areas until installation is complete and the irrigation system can be operated under full control. Water sod sufficiently to moisten subsoil at least 4" deep in a manner not to cause erosion or damage to adjacent finished surfaces. Water shall be free of substances harmful to plant growth. Be responsible for furnishing water from underground sprinkler system, quick couplers or other source.
4. Fertilizing: Within 30 days of sodding and every 30 days thereafter until final acceptance, apply specified fertilizer to maintain optimal sod vigor.
5. Mowing and Trimming: Mow and trim around trees (keeping mulch in saucers and beds), walls, fences, etc., maintaining turf at 2½-2¾" height. Do not remove more than 33% of grass leaf in single mowing. Remove grass clippings from pavement areas.
6. Resodding: Resod spots larger than 1 sq. ft. not having healthy, uniform stand of grass.
7. Weed Control: As required, using selective herbicides approved by Owner.
8. Insect and Disease Control: As required, using insecticides and fungicides approved by Owner.

C. Final Acceptance:

1. At the end of the Maintenance Period, the Owner will, upon written notice of end of Maintenance Period, inspect the work for Final Acceptance. Request shall be received at least ten calendar days before the anticipated date for Final Inspection.
2. Upon completion and reinspection of full repairs or replacements necessary in the judgement of the Owner at that time, the Owner will recommend that Final Acceptance of the Work of this Section be given.

3. Sod areas will be accepted when in compliance with all the following conditions:
 - a. Roots are thoroughly knit to the soil.
 - b. Absence of visible joints.
 - c. All areas show a uniform stand of specified grass in healthy condition, free of weeds, diseases and other visible imperfections.
 - d. At least 30 days have elapsed since the completion of Work under this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sod: Colorado grown Kentucky Bluegrass blend having a healthy, vigorous root system. Blend shall contain a minimum of 3 improved varieties, of which at least one variety is an aggressive type.
- B. Water: Free of substances harmful to plant growth. Be responsible for furnishing water from underground sprinkler system, quick couplers or other source.
- C. Fertilizer: Inorganic mixture with following chemical composition: 20-5-10 with 50% sulfur coated urea (no iron).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General - Verify that existing site conditions are as specified and indicated before beginning work under this section.
 1. Layout: Verify layout of sodded areas as indicated prior to starting operations.
 2. Grades: Verify that grades are within 0.04 ft. of grades indicated and specified.
- B. Unsatisfactory Conditions: Report in writing to General Contractor with copy to Owner.
- C. Beginning of installation means acceptance of existing conditions by this Contractor.

3.2 PREPARATION

- A. Protection:
 1. Be responsible for proper repair to landscape, utilities, walls, pavements, and other site features damaged by operations under this section.
 2. Identify prepared sod areas requiring protection and erect barriers for proper protection and traffic control.
- B. Sodded Areas: Remove weeds, debris and rocks larger than ½". Dispose of accumulated debris at direction of Owner.
- C. Repair: Re-establish grade and specified conditions to damaged sod areas prior to placing

sod.

- D. 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.
- E. Fine Grading: Perform as required to maintain positive drainage, prevent ponding and direct run-off into catch basins, drainage structures, etc., and as required to provide smooth well-contoured surface prior to proceeding. Tolerance: ± 0.04 foot.

3.3 SODDING

- A. Sodding:
 - 1. Soil on which sod is laid: Slightly moist.
 - 2. Lay with longest dimension parallel to contours and in continuous rows.
 - 3. Tightly butt ends and sides of sod together. Stagger and compact vertical joints between sod strips by rolling so sod will be incorporated with the ground surface, insuring tight joints between adjacent pieces. Ensure that sod is neither stretched nor overlapped.
 - 4. Exposed joints due to shrinkage will require replacement of sod in affected areas.
- B. Topsoil: Add along exposed edges to match adjacent grade. Feather topsoil out approximately 1 ft. from edge of sod. Broom screened topsoil over entire sodded area to fill voids but do not smother sod.
- C. Rolling: When soil and sod are moist, roll sod lightly as soon as possible after it is laid. Roller shall weigh 100 to 160 lb per foot of roller. Delay rolling until just before the second watering.
- D. Drainage: Assure that finished areas of sod are graded such that positive drainage of storm and irrigation water will occur and ponding of water will be minimized.
- E. Watering: Thoroughly water sod immediately after laying to a depth sufficient that the underside of the new sod strips and soil below the sod are thoroughly wet.

3.4 FERTILIZING

- A. Fertilizer Applications: Distribute 20-5-10 fertilizer uniformly at the rate of 1 lb. actual nitrogen per 1,000 SF (or 5 lbs. of material per 1000 SF) 30 days after sodding and every 30 days thereafter until Final Acceptance of project by Owner.

3.5 REPAIR OF EXISTING LAWN AREAS DISTURBED BY RENOVATION

- A. Repair existing lawn areas disturbed by renovation work (utilities, paving, etc) as indicated, in accordance with specifications of this section.

3.6 CLEANING

- A. Cleaning: Remove pallets, unused sod, and other debris from site. Clean paved and finished surfaces soiled as a result of work under this Section in accordance with directions

3.7 PROTECTION

- A. General: Provide and install barriers as required and as directed by Owner to protect sodded areas against damage from pedestrian and vehicular traffic until Final Acceptance.

END OF SECTION 02935

PART 1 – GENERAL

1.1 DOCUMENTS: The General Contract Conditions, Drawings and Division 1 Specification Sections apply to Work of this Section.

1.2 SUMMARY:

A. Work Includes: Furnishing, installing, and maintaining live woody plant material.

B. Related Work:

1. Tree Retention & Protection - Section 02150
2. Irrigation System - Section 02810
3. Soil Preparation - Section 02920
4. Topsoil - Section 02925
5. Sodding – Section 02935

1.3 SUBMITTALS

A. Delivery tickets for all bulk materials with Owner's approval or acknowledgment that materials were received in satisfactory condition.

B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.

1. Manufacturer's certified analysis for standard products, where applicable.
2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Samples: 1 cubic foot of mulch for each mulch type required for the project, and 1 cubic foot of organic soil amendment, in labeled plastic bags, boxes, or buckets.

D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of Owner, and other information specified.

E. Analysis of existing surface soil for plant growth.

F. Planting schedule indicating anticipated dates and locations for each type of planting.

G. Three (3) sets of maintenance instructions recommending procedures by the City for maintenance of landscaping during an entire year. Submit before expiration of required maintenance period.

H. Three (3) copies of a written warranty stating all items included in the warranty, conditions of the warranty, and beginning and ending of warranty period(s).

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.
- B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Owner's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- C. Provide quality, size, genus, species, and variety of trees indicated, complying with current applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock", and all applicable state and local rules and regulations.
- D. Inspection: Owner may inspect plants either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, cultivar, size, and quality.
 - 1. The Owner reserves the right to reject, at any time or place prior to final acceptance, all plant materials that fail to meet these specifications in the Owner's opinion. Inspection of materials is primarily for quality, size, and variety, but other requirements are not waived even though visual inspection results in approval. Plants are to be inspected where available; however, inspection at the places of supply shall not preclude the right of rejection at the site or at a later time prior to final acceptance. Rejected material shall be removed from the site within 24 hours.
 - 2. The Contractor shall schedule inspection of the plants, at either the supplier or on-site, to be completed in one visit. Any further inspection required due to plants being unavailable or rejected as not meeting specifications shall be charged to the Contractor at the current hourly rate for the City personnel performing the inspection.
 - 3. The Contractor shall pay all expenses for the Owner to visit the source for plants including airfare, taxi, hotels and meals.
- E. Soil Analysis: The Contractor shall furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any other elements or soil amendments to be added to produce satisfactory topsoil.
 - 2. Provide testing from 4 locations per direction of Owner.
 - 3. The Contractor shall perform soil tests 30 days prior to mobilizing for landscape construction.
 - 4. Soil testing shall be provided by Colorado Analytical Laboratory, 240 S. Main Street, Brighton, CO 80601, (303) 659-2313, or other approved testing facility. Soil shall be tested for soluble salts and nutrient levels. Testing facility shall provide interpretation of results and recommendation for soil amendments for

each type of planting.

5. Deficient nutrients shall be corrected with the addition of appropriate fertilizer and amendment materials. The Contractor shall submit a Change Order Request for all additional materials that are recommended but are not included in this Specification.

F. Measurements: Measure trees according to the requirements of the Colorado Nursery Act, with branches and trunks in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree for height and spread; do not measure branches or roots tip-to-tip.

G. Pre-installation Conference: Contractor shall attend pre-installation conference at location specified by Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site. The Owner reserves the right to inspect containers before or after installation to verify compliance with Specifications.

1.6 PROJECT CONDITIONS

A. Utilities: Determine location of above grade and underground utilities and perform work in a manner that will avoid damage. Hand excavate, as required. Maintain grade stakes until their removal is mutually agreed upon by parties concerned. Contractor shall be responsible for utility locating, repair of utilities damaged by Contractor, and establishment of grade controls.

B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Owner before planting.

C. Protection: Erect and maintain barricades, warning signs and lights, and provide guards as necessary or required to protect all persons on the site.

1.7 COORDINATION AND SCHEDULING

A. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

1.8 WARRANTY

A. General Warranty: The warranty specified in this Article shall not deprive the City of other rights the City may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Warrant plant material and shrubs for a period of one year after date of Final Acceptance, against defects including death and unsatisfactory growth. Warranty shall not cover defects resulting from lack of adequate maintenance, neglect or abuse by

City, hail, or incidents that are beyond Contractor's control.

- C. Replace plant materials that are excessively pruned, more than 20 percent dead, or in an unhealthy or declining condition immediately upon notice from the Owner.
- D. All plants shall be true to name and meet all conditions of these specifications. Any plant that is not true to name as indicated by form, leaf, flower, or fruiting characteristics shall be replaced at the Contractor's expense.
- E. Inadequate or improper maintenance by the City shall not be cause for replacement, provided the Contractor shall have submitted a letter or report to the City on improper or inadequate maintenance practices and recommended remedial actions.
- F. The warranty shall not be enforced should any plant die due to vandalism after Final Acceptance.

PART 2 - PRODUCTS

2.1 PLANT MATERIALS

- A. General: Furnish nursery-grown trees and shrubs conforming to the requirements of the Colorado Nursery Act, with healthy root systems developed by transplanting or root pruning. Provide well shaped, symmetrical, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, girdling, and defects such as sun scald, injuries, abrasions, and disfigurement. Plants of a larger size than that specified in the plant list may be used with a proportionate increase in size of roots and balls, if acceptable to Owner. The additional cost of such larger plants shall be borne by the Contractor.
- B. Label at least 1 plant of each variety and caliper with a securely attached waterproof tag bearing legible designation of botanical and common name.
- C. All plants shall be the species designated on the Drawings. No substitutions will be accepted without the prior written approval of the Owner. Contractor must provide proof of non-availability.

2.2 SHRUBS

- A. Provide plants well established and rooted in removable containers with not less than the minimum number and length of branches required by the Colorado Nursery Act for the pot size indicated.

2.3 MULCH

- A. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of chipped bark and/or wood material not larger than four inches (4") in length. Submit 1.0 CF sample for approval.

2.4 PLANT PIT BACKFILL MATERIAL

- A. Unless otherwise directed by the Owner, the plant pit backfill material shall consist of the

following, thoroughly mixed:

1. Soil originally excavated from the pit (two thirds proportion of total mix)
2. Compost material as specified in Section 02920 (one third proportion of total mix)

B. If imported topsoil is required, it shall meet the requirements specified in Section 02925.

2.5 WATER

A. During the irrigation season (generally May through September), water will be available from on-site quick couplers. When the system is not charged, it shall be the Contractor's responsibility to supply adequate amounts of water (10 gallons per caliper inch) from a water truck or other approved source. Hoses and other watering equipment shall be supplied by Contractor.

B. Water shall not contain any substances injurious to plant growth.

2.6 MISCELLANEOUS MATERIALS

A. Pre-Emergent Herbicide: Treflan as manufactured by Elanco Company, or an approved substitution.

B. Herbicides and Pesticides: EPA registered and approved, of type recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Cooperate with any other contractors and trades, who may be working in and adjacent to the landscape work areas. Examine drawings which show the development of the entire site and become familiar with the scope of all work required.

3.2 FINISH AND FINE GRADING

A. Tillable Soil: Mechanically rip or disk subsoil in all areas to be planted to minimum depth of 6 inches prior to placing top soil and soil amendments.

B. Topsoil Placement: Place topsoil to a depth of 4" over all areas to be landscaped (turf and shrub beds).

C. Positive Surface Drainage: Finish and fine grade the project area to establish an even and well matched gradient over the entire surface. Provide positive surface drainage, with no depressions, settling, or irregularities in the finished grade.

D. Transitional Areas: At any transitional point or line where one plane intersects another, such as from a sloping area or berm to a level area, a smooth and gentle transition shall

be made. There shall be no abrupt changes in grade unless specifically noted otherwise. Match the grades of new work with existing areas outside the project area.

- E. Finish Grade Tolerance: The finish grade elevation shall not vary above or below the proposed grade more than 0.04 foot.

3.3 PREPARATION:

- A. Lay out individual tree locations and areas for multiple plantings. Stake locations, outline areas, and secure Owner's acceptance before the start of planting work. Make adjustments as directed at no additional cost to the City.

3.4 WEED CONTROL

- A. In areas that have been regraded and/or have existing weed growth, weed control measures appropriate to the amount of growth and/or species shall be provided. Submit weed control plan to Owner for approval.
- B. Clear and grub, apply pre-emergent herbicide, and/or apply post emergent herbicide as necessary to eliminate weeds. Do not proceed with landscape work until weed growth has been controlled.

3.5 EXCAVATION FOR PLANT MATERIAL

- A. Container-Grown Plant Material: Excavate approximately 2 times as wide as container diameter. The depth of all plant pits shall be 1 inch less than depth of container.
 - 1. Where drain tile is shown or required under planted areas, excavate to top of porous backfill over tile.
- B. Obstructions: Notify Owner if unexpected rock or obstructions detrimental to plant material are encountered in excavation.
- C. Drainage: Notify Owner if subsoil conditions show evidence of water seepage or retention in plant pit.
 - 1. Fill the pit with water and allow it to completely drain before planting occurs.
 - 2. If water does not drain out of pit within 24 hours, notify Owner.

3.6 PLANTING SHRUBS

- A. Container Grown Stock:
 - 1. Carefully remove containers so as not to damage root balls.
 - 2. Lightly scratch sides of exposed root ball to loosen surface roots.
 - 3. Set plants plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
 - 4. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed.

Water again after placing and tamping final layer of backfill.

3.7 PRUNING OF PLANTS: Prune only damaged or dead branches as directed by Owner.

3.8 MULCHING

- A. Mulch backfilled surfaces of pits, planted areas, non-irrigated zones, and other areas indicated.
- B. Pre-Emergent Herbicide: Apply pre-emergent herbicide to all shrub beds at the rate recommended by the manufacturer. Do not apply to annual, perennial, or ground cover areas.
- C. Mulch in shrub bed areas: Apply 4" thick layer of mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.
- D. Mulch in Tree Pits: Create 48" diameter saucer around tree and fill with 4" deep specified wood mulch. Mulch shall be kept 6" away from tree trunk.

3.9 INSTALLATION OF MISCELLANEOUS MATERIALS

- A. Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.
 - 1. When deciduous plants are moved in full-leaf, Owner may direct the use of an antidesiccant at nursery before moving and again 2 weeks after planting.

3.10 CLEANUP AND PROTECTION

- A. During landscaping, keep pavements clean and work area in an orderly condition.
- B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.
- C. At the time of the final inspection of the work, clean all paved areas by sweeping and washing. Remove construction equipment, excess materials, debris or rubbish from the site.

3.11 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION 02950

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Section includes delivery, storage and installation of site furnishings.
 - 1. Volleyball net
 - 2. Removable bollard
 - 3. Basketball goal
 - 4. Bases and base anchors

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 02200: Earthwork.
- B. Section 02515: Concrete.
- C. Section 02950: Trees, Shrubs and Ground Cover.
- D. Drawings and general provisions of the Construction Contract, and Division-1 Specification sections apply to work of this section.

1.3 SUBMITTALS

- A. Provide soil compaction tests as required in the general conditions.

1.4 QUALITY ASSURANCE

- A. Coordination: All metal edging to be placed after final grades are established.
- B. Perform work with personnel experienced in the work required under direction of a skilled foreman.

1.5 EXISTING CONDITIONS

- A. Contractor shall approve existing conditions prior to beginning all landscape work. Beginning work indicates acceptance of existing conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Volleyball Net: Bison model # SVB 2000 available through Churchich Recreation LLC 303-550-4414 or approved equal.
- B. Removable Bollard: Internal locking removable bollards, Carbon Steel IBR series. Cal Pipe security bollards 877-283-8518.

- C. Basketball Goal: Bison Model # PR 55 on PA 777 available through Churchich Recreation LLC 303-550-4414 or approved equal.
- D. Bases and base anchors:
 - a. Home Plate Bolco No. 300 AS
 - b. Base anchors – Hollywood 11” square
 - c. Pitchers Plate – Bolco No. 430-FYG

PART 3 - EXECUTION

3.1 PREPARATION

- A. Excavate for footings. Moisten base, compact to 90% of Standard Proctor Density.

3.2 INSTALLATION

- A. Volleyball Net install per manufacturer’s recommendations.
- B. Removable bollards install per manufacturer’s recommendations.
- C. Basketball goal install per manufacturer’s recommendations.
- D. Bases and base anchors install per manufacturer’s recommendations.

3.3 FIELD QUALITY CONTROL

- A. All items must be protected from staining, cracking, chipping, vandalism, and other drainage during progress of the work and left in a first class condition upon completion.

END OF SECTION 02960

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings, and Division-1 Specification sections apply to Work of this Section.
- 1.2 SUMMARY:
- A. The work of this section consists of furnishing and placing formwork, shoring, bracing and anchorage, concrete reinforcement, accessories, and placing concrete in connection with cast-in-place concrete installation including installation of joints, concrete curing and concrete finishing.
 - B. All work provided under this Section must also comply with all other Contract requirements.
 - C. Related Work:
 - 1. Concrete Walks, Curbs, and Miscellaneous Flatwork: Section 02520
- 1.3 REFERENCES:
- 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. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
 - K. ASTM C33 - Concrete Aggregates.
 - L. ASTM C94 - Ready-Mixed Concrete.
 - M. ASTM C150 - Portland cement.
 - N. ASTM C260 - Air Entraining Admixtures for Concrete.

- O. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- P. ASTM C494 - Water Reducing Admixtures for Concrete.
- Q. ASTM C618 - Fly Ash Mineral Admixture for Concrete.
- R. ASTM C672 - Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
- S. FS TT-C-800 - Curing Compound, Concrete, for New and Existing Surfaces.
- T. CRSI - Manual of Standard Practice.

1.4 QUALITY CONTROL:

- A. Requirements of Regulatory Agencies: Comply with all applicable provisions of the state and local building and safety codes.
- B. Reference Standards: Comply with following standards except where more stringent requirements are shown or specified:
 - 1. ACI 301, "Specification for Structural Concrete for Buildings." Contractor shall make a copy of ACI 301 available at the project field office for the duration of the project.
- C. The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.
 - 1. Inspection or testing does not relieve the Contractor of his responsibility to perform the Work in accordance with the Contract Documents.
- D. Testing: The Contractor shall contact a testing lab per sections 01400 at least 48 hours prior to installing concrete to arrange for testing.
 - 1. Contractor shall provide and pay for all testing required.
- E. Record of Work: A record shall be kept by the General 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 Owner for examination at any time.

1.5 SUBMITTALS:

- A. Mix Designs:
 - 1. Submit substantiating data for each concrete mix design contemplated for use to the Engineer not less than 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, including all admixtures used.
 - d. Wet and dry unit weight.
 - e. Entrained air content.

- f. Design slump.
 - g. Strength qualification data.
- B. 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.

1.6 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 will be kept free of mud and damage.
- C. Hauling Time for Concrete: Discharge all concrete transmitted in a truck mixer, agitator, or other transportation device not later than 1-1/2 hours, or 300 revolutions of the drum after the 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 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 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.

1.7 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 40° F or when the average outdoor temperature is expected to drop below 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 20° F.
 - c. Subject to acceptance of Owner an accelerating admixture may be used. Admixtures shall meet requirements of Part 2. Calcium Chloride and other chloride-type accelerating admixtures will not be allowed.
 - d. Comply with concrete protection temperature requirements of ACI 306R.

Record concrete temperatures during specified protection period at intervals not to exceed 16 hours and no less than twice during any 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 85° F.
 - c. When air temperatures on day of placement are expected to exceed 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 Owner. 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 rain 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. Plywood Forms: Douglas Fir or Spruce species; solid one side grade; sound, undamaged sheets with straight edges.
- B. Lumber: Douglas Fir or Spruce species; construction grade; with grade stamp clearly visible.
- C. 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 40 for, ties and stirrups; grade 60 for all other bar; billet-steel deformed bars, uncoated finish.
- B. Welded Steel Wire Fabric: ANSI/ASTM A185 plain type; in flat sheets or coiled rolls; uncoated finish.
- C. Tie Wire: ASTM A82, minimum 16 gage annealed type.
- D. Chairs, Bolsters, Bar Supports, 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 CONCRETE MATERIALS:

- A. ACI 301: 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 564 lbs. per cubic yard.
 - 3. Fly ash: ASTM C618 Class C or F. Fly ash shall not exceed 20% of total cementitious material by weight.
 - 4. Aggregate: ASTM C33. Obtain from same source throughout project.
 - a. Fine Aggregate: Natural sand.
 - b. Coarse Aggregate: Gravel or crushed stone containing no deleterious substances which cause surface spalling.
 - 5. Water: Clean and not detrimental to concrete.

2.4 ADMIXTURES:

- A. General: Unless specified, no admixtures may be used without specific approval of the Owner.
- 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" - Euclid Chemical Co.
 - 2. Darex ARA" - W. R. Grace
 - 3. "Micro-Air" - Master Builders
- D. Water Reducing Admixture: ASTM C494, Type A. Subject to compliance with requirements, provide one of the following:
 - 1. "Eucon WR-75" - Euclid Chemical Co.
 - 2. "Rheobuild 1000" - Master Builders
 - 3. "Plastocrete 106" - Sika Chemical Co.
- 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" - Euclid Chemical Co.
 - 2. "Pozzolith 400N" - Master Builders
 - 3. "Sikament" - Sika Chemical Co.
- F. Use of admixtures will not relax cold weather placement requirements.

2.5 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" - Protex
 2. "Cast Off" - Sonneborn or
 3. "Debond" - L&M Construction Chemicals
- B. Epoxy Adhesive: ASTM C881; two-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" - Sika Chemical Corp.
 2. "Patch and Bond Epoxy" - Burke
 3. "Epoxitite" - A.C. Horn
 4. "Sure-Poxy" - Kaufman Products, Inc., or
 5. "Euco Epoxy 463 or 615" - Euclid Chemical Co.
- C. Expansion Joints:
1. Interior Use or Exterior Use Where Sealants Are Specified: Bituminous saturated fiber conforming to ASTM D1751, 1/2 inch thickness. 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, 1/2 inch thickness.

2.6 CURING AND SEALING MATERIALS

- A. Curing and Sealing Compound - Interior Slabs to Remain Exposed and Exterior Concrete: Minimum 30% solids content, maximum moisture loss of 0.030 grams per square centimeter (300 square feet per gallon coverage): Subject to compliance with requirements, use one of the following:
1. Euclid Super Rex Seal or Super Pliocure
 2. Master Builders Masterseal
 3. Approved substitute in accordance with the General Conditions.

2.7 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94 and ACI 301 Chapter 3.
- B. Cement Content: Type II cement, minimum of 564 pounds per cubic yard.
- C. Maximum water-cement ratio: 0.45.
- D. Slump: 4 inches maximum.
- E. Air Entrainment: 4 to 6 percent.
- F. Aggregate Size: 3/4" maximum.
- G. Deliver concrete and discharge entire load within 1-1/2 hours, or before drum has turned 300 revolutions, whichever occurs first, after introduction of mixing water.
- H. During cold weather (below 45 degrees F.), use heated water and aggregates if necessary

to maintain concrete temperature between 60 degrees F. and 90 degrees F.

- I. Concrete for Footings, Walls, and Interior Slabs-on-Grade shall be Class B.
- J. Concrete for Exterior Flatwork, including Pavement, Curb and Gutter, and Drainage Pans shall be Class P.

PART 3 - EXECUTION

3.1 FORMWORK ERECTION:

- A. Construct formwork to maintain tolerances in accordance with ACI 301.
- B. Verify lines, levels, and measurement before proceeding with formwork.
- C. Minimize form joints. Symmetrically align form joints and make watertight to prevent leakage of mortar.
- D. Provide chamfer strips on all exposed corners.
- E. 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.
- F. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, dowels, anchors, and other inserts and embedded materials.
- G. 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.
- H. 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.

3.2 REINFORCEMENT:

- A. Place, support, and secure reinforcement against displacement.
- B. Locate reinforcing splices per ACI 318 unless indicated otherwise on the Drawings.

3.3 PLACING CONCRETE

- A. Owner's Review: Contractor shall provide minimum of 24 hour notice to Owner to allow him to review forms and reinforcement before concrete is placed and to observe placing of concrete.
- B. Contractor's Review: Contractor shall inspect forms and reinforcing prior to concrete placement to assure accurate placement of embedded items and overall acceptability.
- C. Place concrete in accordance with ACI 301 and 304.

- D. Hot Weather Placement: ACI 301 and ACI 305R.
- E. Cold Weather Placement: ACI 301 and ACI 306R.
- F. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.

3.4 FINISHING:

- A. Rough Form Finish: Texture imparted by form facing material, with tie holes and defective areas repaired and patched, and all fins and other projections exceeding 1/4 inch 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.

3.5 SLAB FINISHING:

- A. Definitions: Refer to ACI 301 11.7 for definition of slab surface finishes.
- B. Provide trowel finish slab surface on all slabs scheduled to receive floor finish. Provide broom finish for all exterior concrete unless otherwise noted.
- C. Trowel Finish: Consolidate surface by final hand or power-driven troweling operation, free of trowel marks, uniform in texture and appearance. Tolerance to be Class AX, 0.188 inch in 10 feet.
- D. Broom Finish: Immediately after float finishing and tooling control joints, roughen surface with fiber-bristle broom. Confirm direction or pattern of broom finish with Owner prior to commencing slab placement.
- E. Conform to ACI 301 and ACI 117 tolerance requirements.

3.6 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 70% of the specified 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. 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" lap over adjacent absorptive covers.
 2. Provide moisture retaining cover curing as follows: Over concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practical width with sides and ends lapped at least 3" 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 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 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: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

3.7 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 50 degrees F. for 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.

3.8 TOLERANCES:

- A. Formed Surfaces and Building Lines: Conform to ACI 301 4.3.
- B. Slab Finishing Tolerances: See Section 02520.
- 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: +/- 1/8".
 - b. Location and alignment of anchor bolt groups from designated location and alignment: +/-1/4".

3.9 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. Testing Agency: Per Section 1400. Sampling and testing for quality control during placement of concrete shall include the following.
 - 1. Slump: ASTM C143; at least one test at point of discharge for each day's pour of each type of concrete; additional tests at the Quality Control Inspector's discretion when concrete consistency seems to have changed. Test when taking samples for compression tests.
 - 2. Air Content: ASTM C173, volumetric method for normal weight concrete; ASTM C231 pressure method for normal weight concrete; at least one for each day's pour of each type of air-entrained concrete. Test when taking samples for compression tests.
 - 3. Concrete Temperature: Test hourly when air temperature is 40° F (4 degrees C) and below, and when 80° F (27 degrees C) and above; and each time a set of compression test specimens is made.
 - 4. Compression Test Specimen: ASTM C31; one set of 3 standard cylinders for each compression strength test unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimen are required. If additional cylinders are required by the Contractor for any reason, they shall be done at the contractor's expense.
- B. Compressive Strength Tests: ASTM C39; one set for each day's pour exceeding 5 cubic yards. Two specimens tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

END OF SECTION 03300

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Metal fabrications work as shown on drawings for items fabricated from iron and steel shapes, plates, bars, strips, tubes, pipes and castings.
- B. Products Furnished But Not Installed Under This Section: Placement of metal fabrications in concrete including anchors and supports for precast concrete. Placement of metal fabrications in masonry. See details.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 02520: Concrete.
- B. Drawings and general provisions of the Construction Contract, and Division-1 Specification sections apply to work of this section.

1.3 SUBMITTALS

- A. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others. Base on field measurements wherever possible.

1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting wherever taking field measurements before fabrication might delay work.
- B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
- C. Clearly mark units for reassembly and coordinated installation.
- D. Welder Qualifications: Welding only by Certified Welding Operators, AWS Code Qualified.
- E. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings," and including "Commentary on the AISC Specification."
- F. AISI "Specification for the Design of Cold-Formed Steel Structural Members."
- G. AWS "Code for Welding in Building Construction."
- H. ASTM A-6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."

- I. Welders shall be AWS Code qualified.
- J. Fabricators shall be experienced in fabrication of miscellaneous metal.
- K. Reference Standards:
 - 1. Welding: Conform to "AWS Structural Welding Code."

1.5 DELIVERY, STORAGE AND HANDLING

- A. Materials to be installed by Others: Deliver anchor bolts and other anchorage devices which are embedded in cast-in-place concrete or masonry construction to the project site in time to be installed before the start of cast-in-place concrete operations or masonry work.
- B. Storage of Metals: Metals which are stored at the project site shall be above ground on platforms, skids, or other supports. Protect steel from corrosion. Store other materials in a weathertight and dry place, until ready for use.
- C. Store package materials in their original unbroken package or container.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Metal Surfaces: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

2.2 FERROUS METALS

- A. Steel Plates, Shapes and Bars: ASTM A36.
- B. Steel Plates to Bent or Cold-Formed: ASTM A283, Grade C.
- C. Steel Bar Grating: ASTM A569 or A36.
- D. Steel Pipe: ASTM A53; type as selected; Grade A; black finish, Schedule 40, unless otherwise indicated.
- E. Non-Metallic Shrinkage Resistant Grout: U.S. Grout Corp. "Five Star Grout", L & M "Crystex", Masterbuilders "Masterflow 713", "Propak" by Protex, or approved equal.
- F. Fasteners: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
- G. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.
- H. Machine Screws: Cadmium plated steel, FS FF-S-92.
- I. Wood Screws: Flat head carbon steel, FS FF-S-111.

- J. Lag Bolts: Square head type, FS FF-B-561.
- K. Plain Washers: Round, carbon steel, FS FF-W-92.
- L. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
- M. Toggle Bolts: Tumble-wing type, FS FF-W-84.

2.3 PAINT

- A. Metal Primer Paint: Rust-oleum.
- B. Primer selected must be compatible with finish coats of paint.
- C. Finish Paint: Powder coat color per plans.

2.4 FABRICATION

- A. Workmanship: Use of materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
- B. Form exposed work to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Philips flat-head (countersunk) screws or bolts.
- E. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- F. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- G. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- H. Handrails: Design and fabricate handrails, supports and anchorages to meet requirements of ASTM E985.

2.5 FINISHING

- A. Galvanizing: Provide a zinc coating for those ferrous items shown or specified to be galvanized, as follows:

ASTM A386 for galvanizing assembled steel products.

- B. Shop Painting: Shop Paint miscellaneous ferrous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.

Follow procedures for preparation and painting published by SSPC PA1. Provide dry paint film thickness of 2 mils minimum.

Prepare items exposed to view in accordance with SSPC SP-1 and SP-6.

Prepare concealed items in accordance with SSPC SP-1 and SP-2 or 3 or better.

Spray apply paint to items exposed to view.

2.6 MISCELLANEOUS METAL FABRICATIONS

- A. Rough Hardware: Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.

Manufacture or fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

- B. Steel Handrails: Fabricate to lines, levels and patterns as shown on drawings and to conform to applicable codes. Cut, miter and weld joints. Fill, grind and smooth as required. Provide wall returns at ends of wall mounted rails and close all ends except where otherwise indicated.

Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.

S At tee and cross intersections provide coped joints.

– At bends interconnect pipe by means of prefabricated elbow fittings or flush radius bends, as applicable, or radiuses indicated.

S Fabricate from 1.25" NPS round pipe unless otherwise shown.

- C. Miscellaneous Steel Items: Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.

Equip units with integrally welded anchors as required for securing to adjacent construction.

Fabricate precast concrete anchors, except those cast into precast members, as detailed and as required by final precast shop drawings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment, elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.

Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.

Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

- C. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

D. Steel Pipe Railings and Handrails: Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated, or if not indicated, as required by design loadings. Plumb posts in each direction. Secure posts and railing ends to building construction.

Anchor posts in concrete by means of pipe sleeves preset and anchored into concrete or drilled into concrete. Provide sleeves or holes not less than 0.75" greater than outside diameter of pipe and 6" or more deep. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with shrinkage resistant, non-metallic grout, mixed and placed to comply with grout manufacturer's directions.

END OF SECTION 05500

APPENDIX A:

EROSION CONTROL NARRATIVE

APPENDIX B:

SAMPLE INSPECTION REPORT

APPENDIX C:

**CENTRAL CONTROL
CERTIFICATION CHECKLIST**

APPENDIX A:

Erosion Control Narrative

Narrative Report Information Worksheet

City and County of Denver Construction Activities Stormwater Management Plan

APPLICANT

Company Name: Denver Parks and Recreation
Ruth Murayama

Mailing Address: 201 W Colfax Ave

City, State, Zip Code: Denver, CO 80202

Phone Number: (720) 913-0613 *FAX Number* ()

LOCAL CONTACT/PROJECT MANAGER

Name: _____

Mailing Address: _____

City, State, Zip Code: _____

Phone Number: () *FAX Number* ()

CONSULTANT

Company Name: JVA, Inc

Mailing Address: 1319 Spruce St

City, State, Zip Code: Boulder, CO

Phone Number: (303) 444-1951 *FAX Number* (303) 444-1957

Project Engineer: Chad Cantrell

PROJECT LOCATION

Name of Project or Development: Swansea Park

Street Address*: 2650 East 49th Avenue

**Township: _____ Range: _____ Section: _____ Quarter Section: _____

**Latitude (+/- 15"): _____, Longitude (+/- 15"): _____

Metropolitan District: _____

*Submission of an Address Assignment Slip issued by the City Engineer's Office is required.

** Required if Street Address is unavailable.

NATURE OF CONSTRUCTION

Check the appropriate description(s) or provide a brief description that indicates the general nature of the construction activities. A full description of activities must be included in the Stormwater Management Plan.

- Single Family Residential Development
- Multi-Family Residential Development
- Commercial Development
- Oil and Gas Production and/or Exploration (including pad sites and associated infrastructure)
- Highway/Road Development (not including roadways associated with commercial or residential development)
- Other, Describe: Park

LOCATION DESCRIPTION

1. Acreage

a. Total Site Acreage: 11.39

b. Acreage Subject to Disturbance: 3.50

c. Acreage Determination (Public Utility Projects):

Area bounded by predefined construction limits: _____

or

Pipe/Conduit Length x Right of Way Width: _____

or

Paving Length x Cartway (Paving Operation only): _____

Calculations shall include all areas proposed for contractor laydown, materials storage, equipment storage, areas where equipment repair and fueling will occur, ingress, and egress (include haul roads and borrow pits.)

2. Current Site Conditions:

a. Historical Land Use: (may be for partial site)

Known Landfill site: YES _____ NO x

Has any of the following activities occurred on site:

- Metal Refining YES _____ NO x

- Petroleum Refining YES _____ NO x

- Petroleum Storage YES _____ NO x

- Chemical Manufacturing YES _____ NO x

- Pesticide/Fertilizer Manufacture/Storage YES _____ NO x

- Rail Yard YES _____ NO x

If the response to any of the above is YES, Please describe:

b. Possible Site Contamination: Is the site part of any of the following:

Known Denver Radium Site YES _____ NO x

Known Denver LUST Site YES _____ NO x

Known Superfund Site YES _____ NO x

Known CERCLA Site YES _____ NO x

Known RCRA Site YES _____ NO x

If the response to any of the preceding is YES, Please describe:

Describe any other known site contamination:

No known site contaminants

c. Current Land Use:

Describe existing use: Park with recreational facilities

Are there any building/structures on site? YES X NO _____

Existing Topography

- Description: Existing site is in a slight bowl with a fairly flat drainage path to the north

- Highest Elevation: 5183 Lowest Elevation: 5178

- Steepest Slope: 4:1 Average Slope: 0.5%

- Direction North

d. Vegetation:

Identify the types of vegetation found on-site:

Irrigated sod with a mix of trees and shrubs

Estimate the existing density of vegetation:

Approximately 95%

Submittal of Photographs is not required but highly recommended

e. Drainage:

Identify all adjacent surface water flows (run-on) that may impact and/or runoff from the subject site:

No known runon flow due to alley in the east and grading along south and west

Identify the State Receiving Waters:

South Platte River

Describe the flow routing from the site to the Receiving Waters:

Overland flow to FES at north end of site entering the public storm sewer system

Are there any springs or seeps located on-site? YES _____ NO X

Are there any defined drainage channels on-site? YES _____ NO X

Does the site fall within a Regulatory Floodplain? YES _____ NO X

If the answer is YES, a Floodplain Development Permit issued by the Public Works Department may be required.

f. Wetlands:

Identify all on-site wetlands/wetlands channels:

Define the dimensions/surface areas for each identified wetland

1. _____
2. _____
3. _____

Tributary or adjacent Wetlands Areas

- Upstream of the site? YES _____ NO X

- Downstream of the site? YES _____ NO X

Will the proposed construction work impact any of the on-site wetland areas?

YES _____ NO X

If the answer is YES, attach copies of correspondence with the State of Colorado and U.S. Army Corps of Engineers concerning permits and approvals for the work.

g. Soils:

Identify the predominant Hydrologic Soil Group found on site.

A _____ B _____ C X D _____

What is the runoff coefficient for the undeveloped site?

100 Year runoff coefficient is approximately 0.55

Describe the soil texture found on-site.

No geotech report was prepared for the site. Assumed Type C soils due to urban nature

Is there any outcropping of bedrock on site? YES _____ NO X

Will grading or excavation on site reach bedrock? YES _____ NO X

If YES, what is the depth of the bedrock? _____

Will grading or excavation penetrate the Water Table? YES _____ NO _____

If YES, what is the depth of the Water Table? _____

h. Erosion Potential:

Provide estimates of the potential annual soil loss from the site for the following conditions:

Erosion by water from an unprotected site _____ tons per acre per year.

Erosion by water from a protected ¹ site _____ tons per acre per year.

Identify the procedures/formulas used to produce these estimates.

If the Universal Soil Loss Equation (USLE) has been used, provide the values used for the following.

R (Annual Erosion Index) _____

K (Soil Erodibility Factor) _____

LS (Length/percent Slope Factor) _____

C (Soil Cover Factor) _____

Provide estimates of the potential annual soil loss from the site for the following conditions:

Erosion by wind from an unprotected site _____ tons per acre per year.

Erosion by wind from a protected ² site _____ tons per acre per year

Identify the procedures/formulas used to produce these estimates.

Minimal Erosion due to urban nature of the site and minimal amount of grading

G. PROJECT DESCRIPTION

Proposed Construction

Identify which of the following activities will occur during development of the site:

Clearing and Grubbing YES _____ NO X

Mass Overlot Grading YES _____ NO X

Cut Operations YES X NO _____

If YES, estimate volume of cut (cubic yards) 800

Fill Operations YES _____ NO X

If YES, estimate volume of fill (cubic yards) _____

Building Demolition YES _____ NO X

41 _____

¹ protected site: calculations shall be based on the measures proposed for use on the site

² protected site: calculations shall be based on the measures proposed for use on the site

Foundation Excavation YES _____ NO x
 Utility Construction YES _____ NO x
 Street Construction and Paving YES _____ NO x
 Building Construction YES _____ NO x
 Parking Lot Construction/Paving YES _____ NO x
 Landscaping YES x NO _____
 Will Storm and Sanitary Sewer systems be constructed as Public Sewers? YES _____ NO x
 If YES, identify the SP or W Project Numbers assigned* by WMD for each project

If sewers are private or being constructed by a governmental agency other than Public Works identify the PR, M, or O Project Numbers assigned* by Public Works.

**if Public Works Project Numbers have not been assigned but will be in the future, please indicate as "Not Assigned."*

2. Construction Scheduling

a. Grading Operations

Proposed Start Date: September 2010
 Proposed Completion Date: September 2010

b. Utility/Infrastructure Construction

Proposed Start Date: NA
 Proposed Completion Date: NA

c. Building Construction

Proposed Start Date: NA
 Proposed Completion Date: NA

d. Landscaping/Site Stabilization

Proposed Start Date: September 2010
 Proposed Completion Date: September 2010

e. Detailed Construction Schedule (attach to application)

Submission of a Detailed Construction Schedule is required. The schedule shall include all major construction activities as well as the installation of proposed erosion control measures, sediment/pollutant control measures, interim and final site stabilization measures, permanent erosion prevention measures, and permanent water quality enhancement facilities.

3. Spill Prevention and Management (attach to application)

Submission of a Spill Prevention and Management Plan is required. The plan shall identify the measures proposed to prevent the discharge of pollutants resulting from spills and expedite the cleanup and proper disposal of soils contaminated by chemical, petroleum or hazardous materials.

4. Required Best Management Practices (BMP)

As listed, under Section 3 of Information Guide document.

5. Construction BMP Phasing

Denver recognizes 3 basic phases for all construction sites. A discussion of each phase should be included. These phases are.

a. Site Preparation/Grading

Describe the types and placements of BMPs proposed for use during clearing, grubbing, demolition, and grading operations.

Silt fence along north and south sides, VTC at parking lot w/ concrete washout and stabilized staging area

Describe all measures proposed for interim site stabilization.

Installed BMPs will be maintained and left in place until tributary areas are stabilized

Describe the inspection and maintenance schedule proposed for BMPs on-site.

Inspections every 14 days and after each significant rain event. Street sweeping on a daily basis

b. Infrastructure/Building Construction

Describe the types and placements of BMPs proposed for use during utility construction, roadway construction, building construction and paving operations.

Existing BMPs to remain in place.

Describe all measures proposed for interim site stabilization.

Existing BMPs to remain in place until tributary areas are stabilized.

Describe the inspection and maintenance schedule proposed for BMPs on-site.

Inspections every 14 days and after each significant rain event. Street sweeping on a daily basis

c. Site Stabilization/Landscaping

Describe the types and placements of BMPs proposed for use during site stabilization and landscaping, as well as describing all permanent water quality enhancement facilities.

Existing BMPs to remain in place. Irrigated sod will be installed.

Describe all measures proposed for final site stabilization.

Existing BMPs to remain in place until tributary areas are stabilized.

Describe the inspection and maintenance schedule proposed for BMPs on-site.

Inspections every 14 days and after each significant rain event.

Identify any annual grasses proposed for use in stabilizing the site.

Bluegrass sod at irrigated areas

List the perennial grasses seed mix proposed for site stabilization.

Identify the estimated date for seeding. September 2010

6. Post Construction Water Quality

a. Identify permanent water quality BMPs proposed for site sediment control:

Grass Buffer	YES <u> </u>	NO <u> x </u>
Grass Swale	YES <u> </u>	NO <u> x </u>
Modular Block Porous Pavement	YES <u> </u>	NO <u> x </u>
Porous Pavement Detention	YES <u> </u>	NO <u> x </u>
Porous Landscape Detention	YES <u> </u>	NO <u> x </u>
Extended Detention Basin	YES <u> </u>	NO <u> x </u>
Sand Filter Extended Detention Basin	YES <u> </u>	NO <u> x </u>
Constructed Wetlands Basin	YES <u> </u>	NO <u> x </u>
Retention Pond	YES <u> </u>	NO <u> x </u>
Constructed Wetlands Channel	YES <u> </u>	NO <u> x </u>
Innovative/Proprietary Technology *	YES <u> </u>	NO <u> x </u>

*Use of Innovative/Proprietary Technology will require the submission of the technology developer's technical data, specifications, design criteria and installation requirements for review.

H. Certifications

MATERIAL HANDLING AND SPILL PREVENTION PLAN

Whenever significant quantities of fuels, raw materials, vehicle fluids, fertilizers, pesticides, ash, slag, concrete washout, paints, solvents, waste piles, or other pollutants are to be used onsite, specific procedures for material containment and spill prevention shall be developed and implemented. The following Spill Prevention and Response Plan shall be implemented during construction:

SPILL PREVENTION AND RESPONSE PLAN

INTRODUCTION

The following Spill Prevention and Response Plan shall be implemented during the construction of the City and Count of Denver Department of Parks and Recreation's (DPR) Swansea Park renovations. This plan will be implemented to meet the requirements of the City of Denver, National Response Center, and Colorado Department of Public Health and Environment (CDPHE).

MATERIALS ON-SITE

The contractor will store construction materials and equipment in confined areas onsite from which runoff will be contained and filtered. Materials will be stored off the ground and protected from the weather by a covered or stored in a container such as a van or trailer. Spill control procedures will be implemented when materials are stockpiles or when chemicals and/or fluids are used in the construction area.

STOCKPILES OF DRY MATERIALS

All materials will be stockpiled in designated areas, with BMPs used to reduce and minimize the runoff of contaminants. BMPs such as silt fence and sediment control logs will be installed according to City of Denver criteria using the details shown in the erosion control plans. Loading and unloading operations shall be performed in a manner to limit materials from being spilled. Any spilled material shall be swept up immediately after the operations are performed.

VEHICLE FUELING

All vehicle fueling will be done offsite as much as possible. All on-site fueling operations will be performed in designated areas. Measures will be taken where necessary to reduce and minimize spills during vehicle fueling operations. These measures may include the placement of a temporary berm around the fueling area, covering the fueling area under a temporary portable structure, and/or the placement of drip pans under valves and tank openings. Berms will be constructed around all fueling areas. An adequate supply of absorbents will also be stockpiles at each fueling area.

ROUTINE VEHICLE AND EQUIPMENT MAINTENANCE

All vehicle maintenance will be performed offsite when possible. However, there may be occasions where construction equipment and vehicles may break down at the site and onsite repairs are more feasible. Onsite vehicle and equipment maintenance, if needed, will be performed in designated areas, where practical, and enclosed by earthen berms. All maintenance

areas will maintain an adequate supply of drip pans. These pans will be placed underneath vehicles as needed and absorbents will be used in the event of a minor spill or leak.

SPILL RESPONSE

IN CASE OF FIRE, EVACUATE ALL PERSONNEL FROM THE IMMEDIATE AREA, RENDER FIRST AID TO ANYONE WHO IS INJURED AND DIAL 911 IMMEDIATELY. TAKE APPROPRIATE STEPS TO PROTECT HUMAN LIFE AND CONTROL FIRES FIRST. SPILL CONTROL IS A SECONDARY CONCERN.

CLEANUP AND REMOVAL PROCEDURES

Upon detection of any spill, the first action is ensuring personal safety. All possible ignition sources, including running engines, electrical equipment (including cellular telephones, etc.), or other hazards will be immediately turned off or removed from the area. The extent of the spill and the nature of the spilled material will be evaluated to determine if remedial actions could result in any health hazards, escalation of the spill, or further damage that would intensify the problem. If such conditions exist, a designated employee will oversee the area of the spill and the construction supervisor will be notified immediately.

The source of the spill will be identified and if possible the flow of pollutants stopped if it can be done safely. However, no employee will attend to the source or begin cleanup of the spill until ALL emergency priority (fire, injuries, etc.) have been addressed.

SMALL SPILLS

Small spills, usually less than 5 gallons, consists of minor quantities of gasoline, oil, anti-freeze, or other materials than can be cleaned up by a single employee using readily available materials.

The following procedures shall be used for cleanup of small spills:

1. Ensure personal safety, evaluate the spill, and if possible stop the flow of pollutants.
2. Contain the spread of the spill using absorbents, portable berms, sandbags, or other available measures.
3. Spread absorbent materials on the area to soak up as much of the liquid as possible and to prevent or minimize infiltration into the soil.
4. Once the liquids have been absorbed, remove all absorbents from the spill and place the materials in a suitable storage container. On paved areas, wipe any remaining liquids from the surface and place the materials in a storage container. Do not spray or wash down the area using water. For open soils areas, excavate any contaminated soil as soon as possible and place the soil in a suitable storage container. All materials will then be transported offsite for disposal.
5. If immediate transfer and storage of the contaminated soil is not practical, excavate and place the contaminated soil on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm should be formed around the outer edges of the soil

stockpile, underneath the film, to ensure that contaminants are not washed from the site during precipitation events and that materials do not seep through the berm.

6. Record all significant facts and information about the spill, including the following:
 - a. Type of pollutant
 - b. Location
 - c. Apparent source
 - d. Estimated volume
 - e. Time of discovery
 - f. Actions taken to clean up spill
7. Notify the supervisor of the spill and provide the information from Item #6. The supervisor will then contact the DPR Environmental Compliance Manager.

MEDIUM TO LARGE SPILLS

Medium to large spills consist of larger quantities, usually 5 to 25 gallons, of materials that are used onsite that cannot be controlled by a single employee. Generally, a number of facility personnel will be needed to control the spill and a response may require the suspension of other facility activities.

The following procedure shall be used for the cleanup of medium to large spills:

1. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
2. Immediately dispatch a front-end loader or similar equipment to the spill and construct a berm or berms down gradient of the spill to minimize the spread of potential pollutants. On paved surfaces, portable berms, sandbags, booms, or other measures will be used to control the lateral spread of the pollutants.
3. When the spread of the spill has been laterally contained, contact the supervisor or designated facility employee and provide them information on the locations, type and amount of spilled material, and a briefing on the extent of the spread and measures undertaken to contain the contaminants.
4. Depending on the nature of the spill, mobilize additional resources as needed to contain the contaminants.
5. Cleanup will commence when the lateral spread has been contained and the notification to the supervisor has been made.
6. Freestanding liquid will be bailed or pumped into 55-gallon storage drums, steel tanks, or other suitable storage containers. When all the liquid has been removed from the pavement or soil layer, absorbents will be applied to the surface and transferred to the storage containers when they have soaked up as much of the spill as possible.
7. On paved surface the remaining contaminants will be removed to the extent possible, with rags, sweeping, or similar measures. The area of the spill will not be sprayed or washed down using water. Any contaminant soaked materials will be placed into the storage containers with the other absorbents.

8. The remaining contaminated soils will be excavated and loaded into a dump truck(s) for disposal offsite at a designated facility. If transport offsite is not immediately available, the remaining soils will be stockpiled on a double thickness sheet of 3-mil or higher polyethylene film. In additions, a small berm will be formed around the outer edges of the contaminated soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation and do not seep through the berm.
9. Record all significant facts and information about the spill, including the following:
 - a. Type of pollutant
 - b. Location
 - c. Apparent source
 - d. Estimated volume
 - e. Time of discovery
 - f. Action taken to clean up spill
10. Provide the supervisor or designated employee with the information from Item #9. The supervisor will then contact the DPS Environmental Compliance Manager.

NOTIFICATION

Notification to the Colorado Department of Public Health & Environment (CDPHE) is required if there is any release or suspected release of any substance, including oil or other substances that spill into or threaten State waters. Unless otherwise noted, notifications are to be made by the supervisor and only after emergency responses related to the release have been implemented. This will prevent misinformation and assures that notifications are properly conducted.

The notification requirements are as follows:

1. **Spills into/or Threatens State Waters:** Immediate notification is required for releases that occur beneath the surface of the land or impact or threaten water of the State or threaten the public health and welfare. Notifications that will be made are:
 - a. For any substance, regardless of quantity, contact CDPHE at 1-877-518-5608. State as follows:
 - i. Give your name
 - ii. Give location of spill
 - iii. Describe the nature of the spill, type of product, and estimated size of spill
 - iv. Describe type of action taken thus far, type of assistance or equipment needed
 - b. For any quantity of oil or other fluids, call the Nation Response Center at 1-800-424-8802. State as follows:
 - i. Give your name
 - ii. Give location of spill (name of city and state)
 - iii. Describe the nature of the spill, type of product, and estimate size of spill

- iv. Describe type of action taken thus far, type of assistance or equipment needed
2. **Reportable Quantity Spill on Land Surfaces:** Immediate notification is required of a release upon the land surface of an oil quantity that exceeds 25 gallons, or of a hazardous substance that equals or exceeds 10 pounds or its reportable quantity under Section 101(14) of the *Comprehensive Environmental Response, Compensation Liability Act (CERCLA) of 1980* as amended (*40 CFR Part 302*) and Section 329(3) of the *Emergency Planning and Community Right to Know Act of 1986 (40 CFR Part 355)* whichever is less. The requirement does apply at a minimum to the substances listed below:

Substances Required Notification

Substance	Reportable Quantity
Motor Oil	25 Gallons
Hydraulic Oil	25 Gallons
Gasoline/Diesel Fuel	25 Gallons

The notification procedures to be followed are:

1. Give your name
 2. Give location of spill (name of city and state)
 3. Describe nature of the spill, type of product, and estimate size of spill
 4. Describe type of action taken thus far, type of assistance or equipment needed
 5. Give name of land owner
 6. Specify department responsible for any facilities that may be impacted
3. Notification is not required for release of oil upon the land surface of 25 gallons or less that will not constitute a threat to public health and welfare, the environment, or a threat of entering the waters of the State.
4. Notification, as required in paragraphs 1 and 2 above, will be made to the CDPHE using the 24-hour telephone number to report environmental spills. All information known about the release at the time of discovery is to be included, such as the time of occurrence, quantity and type of material, location and any corrective or cleanup actions presently being taken. The table below lists these phone numbers:

Emergency Notification Contacts

Name/Agency	Number
City of Denver Fire Department	911
City of Denver Police Department	911
Ambulance	911
Hospital	911
National Response Center	1-800-424-8802
CDPHE-24-hour Report Line	1-877-518-5608

It is the responsibility of the supervisor to contact DPS, CDPHE, and/or the National Response Center.

REPORTS

The CDPHE requires written notification of a spill or discharge of oil or other substance that may cause pollution of the waters of the State of Colorado. A written report must be submitted to the Water Quality Control District (WQCD) within five days after becoming aware of the spill or discharge.

The CDPHE requires a written final report within 15 days for all releases of an oil or hazardous substance that require implementation of a contingency plan. The CDPHE may also require additional reports on the status of the cleanup until any required remedial action has been completed.

Written notification of reports must contain at a minimum:

1. Date, time, and duration of the release
2. Location of the release
3. Person or persons causing and responsible for the release
4. Type and amount of oil or substance released
5. Cause of the release
6. Environmental damage caused by the release
7. Actions taken to respond, contain, and clean up the release
8. Location and method of ultimate disposal of the oil or other fluids
9. Actions taken to prevent a recurrence of the release
10. Any known or anticipated acute or chronic health risks associated with the release
11. When appropriate, advice regarding medical attention necessary for exposed individuals

MINIMUM SITE BMP REQUIREMENTS

The following minimum BMP requirements shall be implemented during construction for Swansea Park:

VEHICLE TRACKING CONTROL

A stabilized construction entrance will be provided at the parking lot with access from East 49th Avenue. Vehicle tracking control pads are used to control sediment tracking from disturbed areas onto paved sections. Vehicle tracking control pads are provided at all entrance/exit points from paved sections to disturbed areas. The pad consists of 9" minimum depth of 6" and minus rock installed over a bedding layer of non-woven geotextile material. The rock shall consist of hard, angular, dense and durable stone. Rock shall be groomed in place such that the rock is locked down. The pad will be repaired as necessary and refreshed as it becomes exhausted to maintain function and integrity.

INLET PROTECTION

Drop and area inlet protection is established to provide a sediment barrier and control the discharge of sediment-laden waters into the storm drain from any adjoining areas that may not have established vegetative cover. Drop and area inlet protection is to consist of wire mesh with a maximum opening of 1/2" to 3/4" with 1-1/2" crushed rock fill formed into wattles 10" minimum in diameter and typically 48" in length. Drop and area inlet protection will be placed on existing inlets prior to any land disturbing activities. Protection will be placed on newly constructed inlets within 72 hours of placing the inlet. Rock wattles are to be monitored for correct placement or rupture and adjusted, replaced, or repaired as needed. Sediment accumulated upstream of the inlet protection shall be removed when the sediment depth upstream of the wattle is within 5" of the crest. Inlet protection will remain in place until significant vegetative cover has been uniformly established or stabilization of adjacent land has occurred.

Interim inlet protection is installed after an inlet is poured or placed and prior to paving. Concrete blocks or rock wattles block the entire throat will prevent large clumps of dirt from entering the storm sewer during grading procedures and other construction activities. This temporary feature should be modified to on-grade inlet protection or sump inlet protection after paving is complete. Interim inlet protection needs to be monitored for placement of concrete blocks or misplaced or ruptured wattles. Protection is to be adjusted, replaced, or repaired as needed.

Sump inlet protection consists of rock wattles with a 6-inch minimum diameter, concrete masonry units spaced 24" apart, with an untreated wood 2x4 laid flat and stretched between the hollow portion of the concrete block. Sump inlet protection is intended to maintain inlet capacity by allowing flow to convey over or through rock wattle. Top-side protection is required in the form of a rock wattle along the top of the inlet along the throat edge. Plastic delineators shall be installed for high traffic areas. Accumulated sediment upstream of the protection is to be removed as necessary to prevent bypass. Inlet protection is to be monitored for correct placement or rupture of curb socks and adjusted, replaced, or repaired as needed. Inlet protection is to remain in place until upstream disturbed areas are stabilized and ground cover is approved.

SITE STABILIZATION

If no work is being done for an extended period of time, the area should receive temporary seeding and mulching. Site planning and phasing should include measures to ensure that disturbed areas are seeded within fourteen calendar days after final grading and earthwork activities have been completed or when work is suspended for longer than thirty days. Stockpiles will be seeded and mulched once specified volume is achieved. Seeding should only be applied after appropriate seedbed and soil preparations have occurred to ensure the seedbed is conducive to plant growth. The seedbed shall be well settled and firm, but friable enough that seed can be placed at the appropriate depth. The seedbed shall be reasonably free of weeds. Soils that have been over-compacted by traffic or equipment shall be tilled to breakup rooting restrictive layers and then harrowed, rolled, or packed to prepare the required firm seedbed. Seed shall be applied by drill seeding equipment. Seeded areas shall be covered with crimped straw mulch or erosion control blankets on the same day as the seeding to protect the seedbed and facilitate germination. Mulching consists of evenly distributing straw over a disturbed area for temporary stabilization. The straw shall be clean, weed and seed free, long stemmed grass or hay, or long-stemmed straw of oats, wheat, or rye. At least 50% of mulch, by weight, shall be 10 inches or longer. The straw must be adequately secured by crimping the mulch into the ground to provide immediate protection against rain and wind erosion for exposed soils and promote the growth of vegetation by providing moisture retention and protection of seedbeds against extremes in temperatures. Mulch shall not be bunched and should be applied along the contour of the grade or slope and mechanically anchored using a v-type wheel land packer or a scalloped-disk land packer design to force mulch to a depth of at least 3-inches. Mulch should be at a rate of coverage that will allow no more that 10% of the surface to be exposed, 2-1/2 tons per acres minimum. Hydro-mulching is not appropriate unless an irrigation systems id operated to facilitate germination. Seeded and mulched areas shall be inspected to verify germination, vegetative growth, and adequate cover. Seeded areas that fail to develop uniform, established cover shall be reseeded and re-mulched. Final soil stabilization shall be the final ground cover defined by the site plan, landscaping plan, and/or associated documents. The seed mix and rate of application shall be as follows:

Temporary Seeding:

Common Name	Botanical Name	Variety	Pounds of PLS/acre
Arriba western wheatgrass	<i>Agropyron smithii</i>	Arriba	8.0
Arrhenatherum Elates	<i>Tall oatgrass</i>		3.0
Lolium Perenne	<i>Perennial Ryegrass</i>	Pennfine	2.0

SPILL PREVENTION/CONTAINMENT

A Spill Prevention and Containment Plan is provided in a separate attached document.

CHUTE WASHOUT CONTAINMENT

The purpose of a concrete washout area is to isolate concrete truck washout operations. The concrete washout area is a designated, shallow excavation with a perimeter berm to contain waste from concrete trucks, small concrete mixers, and other washout operations. No concrete waste or washout is to be discharged from a delivery truck, pump truck, or small batch mixer onto the ground outside of a designated washout area. The concrete washout area is combined with the vehicle tracking control pad to control tracking of mud. Signs will be placed at the construction entrance, at the concrete washout area, and elsewhere as necessary to clearly indicate the location of the concrete washout area to operators of concrete trucks and other contractors. The washout area may not be located in such a way that a spill or overflow will be allowed to enter a drainage way or swale. Watertight manufactured bins may be used in place or an earthen excavation. The concrete washout area will be repaired, enlarged, or cleaned out as necessary to maintain capacity for waste concrete and other liquid wastes. Concrete waste from the washout area shall be removed from the site in a watertight container and disposed of at an approved waste site. Solids will be disposed of separately from liquids. When concrete operations are complete, the concrete washout area shall be removed and the disturbed area restored.

STREET SWEEPING

Sediment that leaves the site and enters the public right-of-way will be removed on a daily basis either by hand or with a street sweeper. Street sweepers using water is the preferred method to reduce dust migration. Washing or flushing off paved surfaces with water is prohibited.

PERIMETER CONTROL

Runon entering the site is minimal as it is bounded to the east by an alley with a typical cross section and is protected on other sides by grading. Areas near the drainage channel to the north and the baseball field to the south will be protected with silt fence. Construction fencing will be used to delineate the limits of construction and to control access to the construction site. Construction fence may also be used to designation of tree or other vegetation protection. Construction fence is to be monitored for proper installation and repaired or replaced as necessary. Construction fence may be removed once construction control is no longer necessary and/or at the end of construction.

Silt fence is a temporary sediment barrier constructed of woven fabric stretched across and secured to supporting posts. The bottom edge of the fabric is buried and secured in an anchor trench that is backfilled with soil and compacted. When joints are necessary, filter cloth should be spliced together only at support posts and securely sealed. Silt fence will be provided at the limits of work and around the perimeter of the property and shall be installed prior to any land-disturbing activities. Holes and other areas of compromise shall be promptly repaired, or sections replaced to maintain the silt fencing integrity. Sediment accumulated upstream of silt fencing shall be removed when the upstream sediment reaches a depth of 6-inches.

APPENDIX B:

Sample Inspection Report

Stormwater Construction Site Inspection Report

General Information			
Project Name			
NPDES Tracking No.		Location	
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			
Type of Inspection:			
<input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, provide:			
Storm Start Date & Time:	Storm Duration (hrs):	Approximate Amount of Precipitation (in):	
Weather at time of this inspection?			
<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds			
<input type="checkbox"/> Other: _____ Temperature: _____			
Have any discharges occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, describe:			
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, describe:			

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
13		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
14		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
15		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
16		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
17		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
18		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
19		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
20		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Are discharge points and receiving waters free of any sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Is the construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Print name and title: _____

Signature: _____ **Date:** _____

APPENDIX C:

Central Control Certification Checklist

CENTRAL CONTROL CERTIFICATION CHECKLIST

Required for Substantial Completion—to be completed before final walk through.

PROJECT / LOCATION: _____ DATE: _____

PROJECT FOREMAN/COMPANY: _____ PHONE #: _____

DENVER PARKS' REPRESENTATIVES: _____

DISTRICT/CONTROLLER UNIT ID: _____ CONTROLLER MODEL# _____ SERIAL #: _____

ENCLOSURES

- Enclosure securely mounted on concrete pad per detail, adequate slope exists, and metal mounting template is removed. Inspect conduit size and use and verify spare conduit. For wall mount enclosures – proper size conduits and connectors have been used ensuring a waterproof insect free environment. Enclosure has been mounted away from direct hit by irrigation heads. Controller has waterproof label inside door with date of install, model #, contractor & contact number.

- 110 VAC power connected to enclosure and in conduit as required by Electrical Code. The 110 electrical ground is connected to the controller ground wire and not connected to the “ground” lug in the controller.

- Multiple wire connections are secure and made with waterproof gel filled connectors (DBY or DBR for more than 3 wires).

- Enclosure has louvers and an operational fan, with electrical to City standards installed by manufacturer.

- Communications: (Circle the one that applies)
 - If required, an Ethernet connection has been installed and is operational at the Sentinel or SRTA/CTM.
 - If required, the external antenna has been installed with the proper antenna cable and connections and in a waterproof manner. Cable is routed through top port, and is not nicked or damaged.

- Ground rods and plate are installed to specifications, have been CAD welded, ground wire. Grounding rods are minimum 8' from controller, 16' from other grounding rods. Path of ground wire is smooth and not kinked or bundled in ground box and controller. Copper ground wire is connected to “ground” lug in controller. Controller wires are not installed within the grounding rod's sphere of influence.

- Contractor has provided grounding test results (with Megger meter) and grounding provided is 10 OHMS or less- Results: _____

- Zone wiring connections are appropriately installed (90 degree bend, no excessive bare lead length) and all wires are tagged with Zone labels, including spare wire.

- All zone wiring has been tested for resistance with OHMS within the manufacturer range for new installation, 13-33 depending on solenoid (31-36 OHMS for Rainbird PEB series). Master valve has been tested for resistance (Bermad valve resistance is 14-16 OHMS). A dated log of test results by zone has been furnished. Continuity of spare wires has been tested.

- Master Valve Wire is connected to “MV” position (not to the terminal or to signal cable wires.) Blue master valve wire is connected to yellow common, and green master valve wire is connected to red 24 VAC wire. Confirm controller utility is programmed as N/O.

- All station outputs are in the “Auto” position.

- The flow sensor wires have been connected to the “Flow” side of the alarm terminal strip (red +; Black -), or if using multiple sensors to the MSI/Flowulator assembly. Flow sensor wires are armored signal cable, Paige 7171D-A.

- If Map-To units are required, distance between the Satellite and each Map-to is (specify units and distances) _____

- If required, the rain sensor (with bypass switch) is properly installed and connected to the “alarm” side of the alarm terminal strip and green light indicates sensor is functional and synchronized. If wireless, the rain sensor is within 200 feet of the controller, installed a minimum of 15 feet above ground and not obstructed from rain collection by tree canopy or any other cover.

FLOW SENSORS

- Flow sensor is Data Industrial, model as specified, and installed vertical position. _____
- Flow sensor is installed at proper depth and in an unobstructed meter run (10X pipe diameter upstream and 5x pipe diameter downstream), and has been installed in the correct direction.

- Polarity of wiring is consistent between Flow Sensor & the Sentinel Satellite.

- The flow sensor wire is Paige P-7171D-A or equivalent and is connected at **BOTH** ends.

- If required, additional interface equipment such as MSI/Flowulator has been installed. Specify:

- Flow sensor has been calibrated and set up correctly in field to accurately register flow. Flow sensing has been visually verified at the at Sentinel satellite.

- Wire splices are made with 3MDBY-6 or equivalent

WEATHER STATION – if required

- Weather station is installed per manufacturer's specifications, including grounding and Paige 7171D-A wire.

- As required, a direct cable connection, wireless connection or other acceptable connection is installed and connection between weather station, console and central computer is visually verified at the console and at the central computer.

PROGRAMMING AND COMMUNICATION

- All satellite units have complete irrigation programs, including start times, run times, zone schedules, and flow constraints. All zone data has been input (including zone location, soil type, microclimate, product type, precipitation rate, etc.) Post-establishment schedules have been entered with water use within site water budget. If applicable, establishment schedules have also been programmed as a separate program.

- All equipment has been programmed with correct frequency, and communication between central control, Satellites, Map-to units and hand held remote's has been confirmed.

- All software has been installed, controller manuals, and controller charts per specifications have been supplied.

- As-built has been overlaid on aerial of site on electronic file and imported into the control computer for this site.

Completed By: _____ Date: _____
Contractor Representative Print Name/Company

Completed By: _____ Date: _____
Toro Representative Print Name

Completed By: _____ Date: _____
Parks Representative Print Name