

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Contract Documents

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019



NOTICE TO APPARENT LOW BIDDER

**Sturgeon Electric Company, Inc.
12150 East 112th Avenue
Henderson, CO 80640**

The EXECUTIVE DIRECTOR OF THE DEPARTMENT OF TRANSPORTATION & INFRASTRUCTURE has considered the Bids submitted on **December 19, 2019**, for work to be done and materials to be furnished in and for:

CONTRACT 201952606 - Yale Station Pedestrian Safety

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: **Seventy-One (71) bid items (201-00000 through 700-70589)** the total estimated cost thereof being: **Five Hundred Twenty-Eight Thousand Six Hundred Seventy-Six Dollars and Fifty Cents (\$528,676.50)**.

It will be necessary for you to appear forthwith at the office of the Department of Transportation & Infrastructure, 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 Transportation & Infrastructure, Contract Administration within the time limit set forth in the Bid Package Documents.

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

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

All construction Contracts made and entered into by the City and County of Denver are subject to Affirmative Action and Equal Opportunity Rules and Regulations, as adopted by the Manager of the Department of Transportation & Infrastructure, 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).

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



NOTICE TO APPARENT LOW BIDDER

CONTRACT NO. 201952606

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 24 day of January 2020.

CITY AND COUNTY OF DENVER

By: 

Eulois Cleckley

Executive Director of Department of Transportation & Infrastructure

cc: (CAO), Treasury (taxadmin@denvergov.org), Todd Johnson, Prevailing Wage (prevailingwage@denvergov.org), File

Department of Transportation & Infrastructure/Office of the Executive Director
201 West Colfax Avenue, Dept 608 | Denver, CO 80202

www.denvergov.org/dpw

p. 720.865.8630 | f. 720.865.8795

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Bid Form Package

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019

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

**TABLE OF CONTENTS
FOR
BID FORM AND SUBMITTAL PACKAGE**

Table of Contents	BF-1
Bidder's Checklist	BF-2 through BF-3
Bid Form and Submittal Package Acknowledgment Form	BF-4 through BF-5
Bid Form	BF-6 through BF-8
List of Proposed Minority/Women Business Enterprise(s)	BF-9 through BF-12
Commitment to Minority/Women Business Enterprise Participation	BF-13
Minority/Women Business Enterprise Letter(s) of Intent & Checklist	BF-14 through BF-15
Joint Venture Affidavit	BF-16
Joint Venture Eligibility Form	BF-17 through BF-19
Bid Bond	BF-20
Diversity and Inclusiveness in City Solicitations Form	BF-21 through BF-24



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

BIDDER'S CHECKLIST

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

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

Textura® Construction Payment Management System (“Textura”)

Bidder recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System (“Textura”) for this Project to request payment from the City and to pay subcontractors. All certified subcontractors or suppliers who are listed for participation towards any assigned program goal must be paid via Textura. All fees associated with Textura are to be paid by the bidder for billings for work performed. Bidders are required, when preparing a bid, to enter the price of Textura on the line provided for the service. The fee is all inclusive of all subcontractor, project and subscription fees associated with Textura. The bidder will calculate the fee based on their total bid (not including any alternates, if applicable) and the table below, and then include it on the line item provided in the bid form labeled **“Textura® Construction Payment Management System Fee”**. This expense becomes part of the contract and billable to the City. All costs including, but not limited to, costs associated with training, entering data, and/or utilizing Textura other than the Textura Construction Payment Management System Fee are overhead and shall not be reimbursed by the City. Bidder will be responsible for any tax on the Textura fee. As with other taxes, the City will not reimburse bidder for this cost and therefore this cost should be included in bidder’s bid. Textura will invoice the awarded bidder directly.

Project Value	Project Fee (GC + Sub Usage)
\$100,000 – 249,999.99	\$780
\$250,000 - \$499,999.99	\$1,625
\$500,000 - \$999,999.99	\$3,250
\$1,000,000 - \$2,999,999.99	\$5,850
\$3,000,000 - \$4,999,999.99	\$9,100
\$5,000,000 - \$9,999,999.99	\$12,220
\$10,000,000 - \$19,999,999.99	\$20,345
\$20,000,000 - \$49,999,999.99	\$32,500
\$50,000,000 - \$99,999,999.99	\$48,750
\$100,000,000 - \$199,999,999.99	\$69,095
\$200,000,000 - \$299,999,999.99	\$85,345
\$300,000,000 - \$399,999,999.99	\$109,720
\$400,000,000 - \$499,999,999.99	\$142,220
\$500,000,000 - \$999,999,999.99	\$162,500
\$1,000,000,000 - \$1,999,999,999.99	\$345,345
\$2,000,000,000 - \$4,999,999,999.99	\$650,000
\$5,000,000,000 - \$9,999,999,999.99	\$1,015,625
\$10,000,000,000 or greater	\$1,503,125

For more information:

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

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

BID FORM AND SUBMITTAL PACKAGE ACKNOWLEDGMENT

CONTRACT NO. 201952606

YALE STATION PEDESTRIAN SAFETY

BIDDER: Sturgeon Electric Company, Inc.
(Legal Name per Colorado Secretary of State)

ADDRESS: 12150 East 112th Avenue
Henderson, CO. 80640

CONTACT PERSON FOR ALL MATTERS RELATING TO THIS DOCUMENT:

NAME: Timothy McGinn **TITLE:** Estimator

EMAIL: tmcginn@myrgroup.com **PHONE NUMBER:** 720-601-8666

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. 201952606, Yale Station Pedestrian Safety, made available to the undersigned bidder pursuant to Notice of Invitation for Bids dated November 19, 2019.

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

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

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

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

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

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

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

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

BIDDER: Sturgeon Electric Company, Inc.

ATTEST:

Name: Jim Bushnell

By: 

Title: Vice President, CO Traffic

By: 

Krysta Brewer
Assistant Secretary

[SEAL]

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

BID FORM

**CONTRACT NO. 201952606
YALE STATION PEDESTRIAN SAFETY**

BIDDER Sturgeon Electric Company, Inc.
(Legal Name per Colorado Secretary of State)

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

The Undersigned Bidder, having examined the plans, technical specifications, and remainder of the proposed Contract Documents as designated and enumerated in the General and Special Contract Conditions and any and all addenda thereto; having investigated the location of and conditions affecting the proposed Work; and being acquainted with and fully understanding the extent and character of the Work covered by this bid, and all factors and conditions affecting or which may be affected by Work, HEREBY SUBMITS THIS BID, pursuant to an advertisement of a Notice of Invitation for Bids as published on **November 19, 2019**, to furnish all required materials, tools, appliances, equipment and plant; to perform all necessary labor and to undertake and complete: **Contract No. 201952606, Yale Station Pedestrian Safety**, in Denver, Colorado, in full accordance with and conformity to the Plans, Technical Specifications, and Contract Documents hereto attached or by reference made a part hereof, at and for the following price(s) set forth on this Bid Form.

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

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

Item No.	Description and Price	Estimated Quantity	Estimated Cost
201-00000	Clearing and Grubbing at the unit price of \$ <u>3,450.00</u> per LUMP SUM	1 LS	\$ <u>3,450.00</u>
202-00195	Removal of Median Cover at the unit price of \$ <u>154.00</u> per SQUARE YARD	2 SY	\$ <u>308.00</u>
202-00200	Removal of Sidewalk at the unit price of \$ <u>67.00</u> per SQUARE YARD	17 SY	\$ <u>1,139.00</u>
202-00203	Removal of Curb and Gutter at the unit price of \$ <u>67.00</u> per LINEAR FOOT	39 LF	\$ <u>2,613.00</u>
202-00206	Removal of Concrete Curb Ramp at the unit price of \$ <u>154.00</u> per SQUARE YARD	5 SY	\$ <u>770.00</u>
202-00220	Removal of Asphalt Mat at the unit price of \$ <u>181.00</u> per SQUARE YARD	56 SY	\$ <u>10,136.00</u>
202-00240	Removal of Asphalt Mat (Planing) at the unit price of \$ <u>18.00</u> per SQUARE YARD	276 SY	\$ <u>4,968.00</u>
202-00250	Removal of Pavement Marking at the unit price of \$ <u>6.00</u> per SQUARE FOOT	1,041 SF	\$ <u>6,246.00</u>
203-00100	Muck Excavation at the unit price of \$ <u>151.00</u> per CUBIC YARD	10 CY	\$ <u>1,510.00</u>
202-00810	Removal of Ground Sign at the unit price of \$ <u>265.00</u> per EACH	1 EA	\$ <u>265.00</u>
203-01597	Potholing at the unit price of \$ <u>300.00</u> per HOUR	75 HR	\$ <u>22,500.00</u>
203-02330	Laborer at the unit price of \$ <u>97.00</u> per HOUR	40 HR	\$ <u>3,880.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
208-00035	Aggregate Bag at the unit price of \$ <u>17.50</u> per LINEAR FOOT	30 LF	\$ <u>525.00</u>
208-00045	Concrete Washout Structure at the unit price of \$ <u>950.00</u> per EACH	1 EA	\$ <u>950.00</u>
208-00051	Storm Drain Inlet Protection (Type 1) at the unit price of \$ <u>109.00</u> per LINEAR FOOT	3 LF	\$ <u>327.00</u>
208-00205	Erosion Control Supervisor at the unit price of \$ <u>111.00</u> per HOUR	40 HR	\$ <u>4,440.00</u>
210-00861	Reset Wiring - Fiber Optic at the unit price of \$ <u>5,500.00</u> per LUMP SUM	1 LS	\$ <u>5,500.00</u>
210-04010	Adjust Manhole at the unit price of \$ <u>2,400.00</u> per EACH	1 EA	\$ <u>2,400.00</u>
214-00000	Landscape Maintenance at the unit price of \$ <u>5,500.00</u> per LUMP SUM	1 LS	\$ <u>5,500.00</u>
214-00145	Plant Protect Fence at the unit price of \$ <u>10.50</u> per LINEAR FOOT	60 LF	\$ <u>630.00</u>
304-06007	Aggregate Base Course (Class 6) at the unit price of \$ <u>220.00</u> per CUBIC YARD	10 CY	\$ <u>2,200.00</u>
403-00721	Hot Mix Asphalt (Patching) (Asphalt) at the unit price of \$ <u>395.00</u> per SQUARE YARD	56 SY	\$ <u>22,120.00</u>
403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22) at the unit price of \$ <u>525.00</u> per TON	40 TON	\$ <u>21,000.00</u>
412-00190	Concrete Pavement (Patching) at the unit price of \$ <u>241.00</u> per SQUARE YARD	6 SY	\$ <u>1,446.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
412-00600	Concrete Pavement (6 Inch) at the unit price of \$ <u>220.00</u> per SQUARE YARD	3 SY	\$ <u>660.00</u>
503-00024	Drilled and Vacuumed Caisson (24 Inch) at the unit price of \$ <u>505.00</u> per LINEAR FOOT	7 LF	\$ <u>3,535.00</u>
503-00036	Drilled and Vacuumed Caisson (36 Inch) at the unit price of \$ <u>561.00</u> per LINEAR FOOT	39 LF	\$ <u>21,879.00</u>
607-11580	Construction Limit Fencing at the unit price of \$ <u>16.50</u> per LINEAR FOOT	25 LF	\$ <u>412.50</u>
608-00010	Concrete Curb Ramp at the unit price of \$ <u>353.00</u> per SQUARE YARD	32 SY	\$ <u>11,296.00</u>
608-00015	Detectable Warnings at the unit price of \$ <u>278.00</u> per SQUARE FOOT	44 SF	\$ <u>12,232.00</u>
609-21010	Curb and Gutter Type 2 (Section I-B) (6" Curb and Gutter - 1' Spill Pan) at the unit price of \$ <u>67.00</u> per LINEAR FOOT	188 LF	\$ <u>12,596.00</u>
609-21020	Curb and Gutter Type 2 (Section II-B) (6" Curb and Gutter - 2' Catch/Spill Pan) at the unit price of \$ <u>67.00</u> per LINEAR FOOT	31 LF	\$ <u>2,077.00</u>
610-00030	Median Cover Material (Concrete - 6 Inch) at the unit price of \$ <u>32.00</u> per SQUARE FOOT	480 SF	\$ <u>15,360.00</u>
613-XXXXX	Electric Meter Pedestal Cabinet and Base at the unit price of \$ <u>5,200.00</u> per EACH	1 EA	\$ <u>5,200.00</u>
613-00206	2 Inch Electrical Conduit (Bored) at the unit price of \$ <u>18.00</u> per LINEAR FOOT	195 LF	\$ <u>3,510.00</u>
613-00306	3 Inch Electrical Conduit (Bored) at the unit price of \$ <u>20.00</u> per LINEAR FOOT	365 LF	\$ <u>7,300.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
613-01200	2 Inch Electrical Conduit (Plastic) at the unit price of \$ <u>12.00</u> per LINEAR FOOT	115 LF	\$ <u>1,380.00</u>
613-01300	3 Inch Electrical Conduit (Plastic) at the unit price of \$ <u>13.00</u> per LINEAR FOOT	185 LF	\$ <u>2,405.00</u>
613-07000	Pull Box (Special) at the unit price of \$ <u>1,624.00</u> per EACH	3 EA	\$ <u>4,872.00</u>
613-07002	Type Two Pull Box at the unit price of \$ <u>1,207.00</u> per EACH	4 EA	\$ <u>4,828.00</u>
613-07003	Type Three Pull Box at the unit price of \$ <u>1,294.00</u> per EACH	5 EA	\$ <u>6,470.00</u>
613-10000	Wiring at the unit price of \$ <u>10,500.00</u> per LUMP SUM	1 LS	\$ <u>10,500.00</u>
613-13000	Luminaire (LED) at the unit price of \$ <u>825.00</u> per EACH	4 EA	\$ <u>3,300.00</u>
614-00011	Sign Panel (Class I) at the unit price of \$ <u>34.50</u> per SQUARE FOOT	38 SF	\$ <u>1,311.00</u>
614-00012	Sign Panel (Class II) at the unit price of \$ <u>51.50</u> per SQUARE FOOT	28 SF	\$ <u>1,442.00</u>
614-00216	Steel Sign Post (2x2 Inch Tubing) at the unit price of \$ <u>40.00</u> per LINEAR FOOT	23 LF	\$ <u>920.00</u>
614-70150	Pedestrian Signal Face (16) (Countdown) at the unit price of \$ <u>711.00</u> per EACH	4 EA	\$ <u>2,844.00</u>
614-70336	Traffic Signal Face (12-12-12) at the unit price of \$ <u>865.00</u> per EACH	8 EA	\$ <u>6,920.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
614-70448	Traffic Signal Face (12-12-12-12) at the unit price of \$ <u>1,075.00</u> per EACH	2 EA	\$ <u>2,150.00</u>
614-72855	Traffic Signal Controller and Cabinet at the unit price of \$ <u>24,000.00</u> per EACH	1 EA	\$ <u>24,000.00</u>
614-72860	Pedestrian Push Button at the unit price of \$ <u>425.00</u> per EACH	3 EA	\$ <u>1,275.00</u>
614-72863	Pedestrian Push Button Post Assembly at the unit price of \$ <u>1,850.00</u> per EACH	2 EA	\$ <u>3,700</u>
614-72866	Fire Preemption Unit and Timer at the unit price of \$ <u>3,550.00</u> per EACH	3 EA	\$ <u>10,650.00</u>
614-72895	Intersection Detection System (FLIR Camera) at the unit price of \$ <u>7,650.00</u> per EACH	2 EA	\$ <u>15,300.00</u>
614-81000	Traffic Signal-Light Pole Steel at the unit price of \$ <u>5,687.00</u> per EACH	1 EA	\$ <u>5,687.00</u>
614-81120	Traffic Signal-Light Pole Steel (1-20 Foot Mast Arm) at the unit price of \$ <u>18,500.00</u> per EACH	2 EA	\$ <u>37,000.00</u>
614-81140	Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm) at the unit price of \$ <u>21,600.00</u> per EACH	1 EA	\$ <u>21,600.00</u>
614-86105	Telemetry (Field) at the unit price of \$ <u>5,975.00</u> per EACH	1 EA	\$ <u>5,975.00</u>
614-86800	Uninterrupted Power Supply at the unit price of \$ <u>5,900.00</u> per EACH	1 EA	\$ <u>5,900.00</u>
614-87333	Closed Circuit Television Camera (Traffic Monitoring) at the unit price of \$ <u>5,450.00</u> per EACH	1 EA	\$ <u>5,450.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
614-87690	Ethernet Managed Switch at the unit price of \$ <u>4,700.00</u> per EACH	1 EA	\$ <u>4,700.00</u>
623-00000	Mobilization at the unit price of \$ <u>32,000.00</u> per LUMP SUM	1 LS	\$ <u>32,000.00</u>
625-00000	Construction Surveying at the unit price of \$ <u>8,000.00</u> per LUMP SUM	1 LS	\$ <u>8,000.00</u>
627-00005	Epoxy Pavement Marking at the unit price of \$ <u>350.00</u> per GALLON	6 GAL	\$ <u>2,100.00</u>
627-30405	Preformed Thermoplastic Pavement Marking (Word-Symbol) at the unit price of \$ <u>22.00</u> per SQUARE FOOT	47 SF	\$ <u>1,034.00</u>
627-30410	Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line) at the unit price of \$ <u>11.00</u> per SQUARE FOOT	339 SF	\$ <u>3,729.00</u>
629-01001	Survey Monument (Type 1) at the unit price of \$ <u>700.00</u> per EACH	3 EA	\$ <u>2,100.00</u>
630-XXXXX	Construction Traffic Control at the unit price of \$ <u>38,000.00</u> per LUMP SUM	1 LS	\$ <u>38,000.00</u>
630-00003	Uniformed Traffic Control at the unit price of \$ <u>139.00</u> per HOUR	16 HR	\$ <u>2,224.00</u>
700-70082	Force Account - Furnish & Install Electrical Service at the unit price of \$ <u>19,780.00</u> per FORCE ACCOUNT	1 FA	\$ <u>19,780.00</u>
700-70589	Force Account - Environmental Health & Safety Management at the unit price of \$ <u>5,000.00</u> per FORCE ACCOUNT	1 FA	\$ <u>5,000.00</u>

Bid Items Total Amount (201-00000 through 700-70589 (Seventy-One [71]) total bid items)

Textura ® Fee from table on Page BF-3 (based on Bid Items Total Amount)

Bid Items Total Amount plus Textura® Fee equals Total Bid Amount

~~\$ 531,280.00~~ ^{525,421.50} *JR*

\$ 3,250.00

\$ 528,676.50

Total Bid Amount:

Five Hundred Twenty-Eight Thousand, Six Hundred Seventy-Six Dollars and fifty cents.

Dollars (\$ 528,676.50)

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 Liberty Mutual Surety, a corporation of the State of Mass., is hereby offered as Surety on said bond. If such surety is not approved by the Manager, another and satisfactory surety company shall be furnished.

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

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

Name: NONE Name: _____

Address: _____ Address: _____

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

NO such persons

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
Directional Drilling	3.7%	Drilltech Directional Drilling
		7080 York Street, Denver CO. 80229
Concrete and Asphalt Patching	15%	Chato's Concrete, LLC.
		8326 Quivas Way Denver, CO. 80221
Pavement Markings	1.95%	Colorado Barricade Co.
		2295 South Lipan Street Denver, CO. 80223
Erosion Control	1.7%	Land Ethics of Colorado
		P.O. Box 2423 Elizabeth, CO. 80107
Traffic Control	4.94%	Colorado Barricade Co.
		2295 South Lipan Street Denver, CO. 80223
Surveying	1.2%	Arrow Point Surveying, Ltd
		6078 Blue Terrace Pl. Castle Rock, CO 80108

(Copy this page if additional room is required.)



DENVER
OFFICE OF ECONOMIC
DEVELOPMENT

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

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

City & County of Denver Contract No.: 201952606

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

Prime Bidder

Business Name: Sturgeon Electric Company, Inc.

Address: 12150 East 112th Avenue
Henderson, CO. 80640

Contact Person: Timothy McGinn

Type of Service: Electrical/Traffic Signal

Dollar Amount: \$219,000.00

Percent of Project: 41.42%

Certified MWBE Prime Bidder

Business Name:

Address:

Contact Person:

Type of Service:

Dollar Amount: \$:

Percent of Project:

Subcontractors, Suppliers Manufacturers or Brokers (check one box)

XX

Subcontractor (✓)

Supplier (✓)

Manufacturer (✓)

Broker (✓)

Business Name: Chato's Concrete, LLC

Address: 8326 Quivas Way Denver, CO 80221

Type of Service: Concrete/Asphalt Patching

Contact Person: Marlene Andrade

Dollar Amount: \$: 80,000.00

Percent of Project: 15.13%

Subcontractor (✓)

Supplier (✓)

Manufacturer (✓)

Broker (✓)

Business Name:

Address:

Type of Service:

Contact Person:

Dollar Amount: \$:

Percent of Project:

Subcontractor (✓)

Supplier (✓)

Manufacturer (✓)

Broker (✓)

Business Name:

Address:

Type of Service:

Contact Person:

Dollar Amount: \$:

Percent of Project:

Rev 031816JE

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

Rev 031816JE

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

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

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

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

Business Address of Bidder: 12150 East 112th Ave
City, State, Zip Code: Henderson, CO 80640
Telephone Number of Bidder: 303-286-8000 Fax No. 303-286-1811
Social Security or Federal Employer ID Number of Bidder: 84-0681206

Name and location of the last work of this kind herein contemplated upon which the Bidder was engaged:
York and Josephine - Denver; Mill Levy 7 - Denver

For information relative thereto, please refer to:

Name: Brenda Hageman
Title: Contracts Administrator
Address: City and County of Denver, 201 W. Colfax., Dept 614, Denver, CO. 80202

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

Addenda Number 1 Date 11/25/19
Addenda Number 2 Date 12/10/19
Addenda Number _____ Date _____

Dated this 19th day of December, 2019

Signature of Bidder:

If an Individual: _____ doing business
as _____

If a Partnership: _____
by: _____ General Partner.

If a Corporation: Sturgeon Electric Company, Inc.
a Michigan Corporation,

by: Jim Bushnell, its ~~President~~
Jim Bushnell, Vice President, CO Traffic

Attest:

Krysta Brewer
Assistant Secretary Krysta Brewer (Corporate Seal)

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

Firm: _____

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

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

Firm: _____

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

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

Firm: _____

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

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



DENVER
OFFICE OF ECONOMIC
DEVELOPMENT

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

COMMITMENT TO MWBE PARTICIPATION

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

The Bidder/Proposer is committed to the minimum 15 % **MWBE** utilization on the project, and will submit Letters of Intent (LOI) for each subcontractor/subconsultant listed in the Bid Forms as follows:

Hard Bids: Three (3) business days after the bid opening.

Request for Proposals/Qualifications: With the proposal when due.

Compliance Plans: With each task/work order

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

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

Bidder/Proposer (Name of Firm): Sturgeon Electric Company, Inc.

Firm's Representative (Please print): Timothy McGinn

Signature (Firm's Representative): 

Title: Estimator

Address: 12150 East 112th Ave.

City: Henderson

State: CO.

Zip: 80640

Phone: 303-286-8000

Fax: 303-286-1811

Email: tmcginn@myrgroup.com

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



DENVER
OFFICE OF ECONOMIC
DEVELOPMENT

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

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

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

Contract No.: 201952606		Project Name: Yale Station Pedestrian Safety	
A. The Following Section Is To Be Completed by the Bidder/Consultant This Letter of Intent Must be Signed by the Bidder/Consultant and M/WBE, SBE, EBE or DBE			
Name of Bidder/Consultant: Sturgeon Electric Company, Inc.		Self-Performing: <input type="checkbox"/> Yes <input type="checkbox"/> No	Phone: 303-286-8000
Contact Person: Timothy McGinn		Email: tmcginn@myrgroup.com	Fax:
Address: 12150 East 112th Ave.		City: Henderson	State: CO Zip: 80640
B. The Following Section is To Be Completed by the M/WBE, SBE, EBE or DBE, at any Tier This Letter of Intent Must be Signed by the M/WBE, SBE, EBE or DBE and Bidder/Consultant			
Name of Certified Firm: Chato's Concrete, LLC		Phone: 720-252-7959	
Contact Person: Marlene Andrade		Email: marlene@chatosconcrete.com	Fax: 303-427-7156
Address: 8326 Quivas Way		City: Denver	State: CO Zip: 80221
Please check the designation which applies to the certified firm.		M/WBE (Y) <input checked="" type="checkbox"/>	SBE (Y) <input checked="" type="checkbox"/>
		EBE (Y) <input checked="" type="checkbox"/>	DBE (Y) <input checked="" type="checkbox"/>
Indirect Utilization: If this M/WBE, SBE, EBE or DBE is not a direct first tier subcontractor/subconsultant, supplier or broker to the Bidder/Consultant, please indicate the name of the subcontractor/subconsultant, supplier or broker which is utilizing the participation of this firm:			
A Copy of the M/WBE, SBE, EBE or DBE Letter of Certification must be Attached			
Identify the scope of the work to be performed or supply item that will be provided by the M/WBE/SBE/DBE. <u>On unit price bids only, identify which bid line items the M/WBE/SBE/EBE/DBEs scope of work or supply corresponds to.</u>			
202-00195, 202-00200, 202-00203, 202-00206, 202-00220, 412-00190, 412-00600, 608-00010, 608-00015, 609-21010, 609-21020, 610-00300			
<input checked="" type="checkbox"/>	Subcontractor/Subconsultant (Y)	<input type="checkbox"/>	Supplier (Y)
<input type="checkbox"/>		<input type="checkbox"/>	Broker (Y)
Bidder intends to utilize the aforementioned M/WBE, SBE, EBE or DBE for the Work/Supply described above. The cost of the work and percentage of the total subcontractor M/WBE, SBE, EBE or DBE bid amount is:		\$ 80,000.00 15.13% %	
Consultant intends to utilize the aforementioned M/WBE, SBE, EBE or DBE for the Work/Supply described above. The percentage of the work of the total subconsultant M/WBE, SBE, EBE or DBE will perform is:		N/A %	
If the fee amount of the work to be performed is requested, the fee amount is:		N/A	
Bidder/Consultant's Signature: <i>[Signature]</i>		Date: 12/19/2019	
Title: Estimator			
M/WBE, SBE, EBE or DBE or Self-Performing Firm's Signature: <i>[Signature]</i>		Date: 12.19.19	
Title: Cowner/Partner			
If the above named Bidder/Consultant is not determined to be the successful Bidder/Consultant, this Letter of Intent shall be null and void.			



201 W. Colfax Avenue, #907
Denver, CO Zip 80202
p: 720.913.1999
f: 720.913.1809
www.denvergov.org/dsbo

Denver International Airport
Airport Office Building, Suite 7810
8500 Pena Boulevard
Denver, CO Zip 80249
p: 303.342.2180
f: 303.342.2190
www.Nydenver.com

January 14, 2019

Eleazar Villalobos
Chato's Concrete, LLC DBA N/A
8326 Quivas Way
Denver, CO 80221

Dear Eleazar Villalobos:

SUBJECT: Minority/Women Business Enterprise (M/WBE) Certification, Pursuant to Article III of Chapter 28, Div. 3 of the D.R.M.C. Construction, Reconstruction, Remodeling and Professional Design, Construction Services and Concessions

The City and County of Denver's Division of Small Business Opportunity (DSBO) has approved Chato's Concrete, LLC DBA N/A for certification as a **Minority/Women Business Enterprise (M/WBE)**. Chato's Concrete, LLC DBA N/A will be listed in the City and County of Denver's Minority/Women Business Enterprise (M/WBE) Certification Directory. Your firm is certified with the following certification dates:

January 14, 2019 to January 13, 2020

Listed below is each NAICS code for which Chato's Concrete, LLC DBA N/A is certified. Please verify your NAICS codes as this letter showing the following codes is required for bidding on City projects:

NAICS CODES:

DENVER 237310: CONCRETE PAVING (I.E., HIGHWAY, ROAD, STREET, PUBLIC SIDEWALK)
DENVER 237310: CURBS AND STREET GUTTERS, HIGHWAY, ROAD AND STREET, CONSTRUCTION
DENVER 237310: GUARDRAIL CONSTRUCTION
DENVER 238990: SIDEWALK CONSTRUCTION, RESIDENTIAL AND COMMERCIAL
DENVER 484220: DUMP TRUCKING (E.G., GRAVEL, SAND, TOP SOIL)
DENVER 484220: GRAVEL HAULING, LOCAL
DENVER 484220: SAND HAULING, LOCAL
DENVER 484220: TOP-SOIL HAULING, LOCAL

Concrete Contractor: flatwork, sidewalks, curb ramps, curb and gutter; material hauling; concrete curb paving.hot bituminous paving (Patching Only).

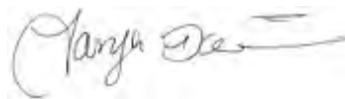
This Certification is intended to be used only for participation in city funded projects, and/or certain privately funded projects on city-owned property for contracts with construction, reconstruction, remodeling and professional design and construction services.

Your business enterprise is required to maintain an accurate mailing address, email address and telephone number information with DSBO. If any changes occur in the firm's legal structure, ownership, management, control, or work performed, you must notify DSBO immediately. Failure to report any of these changes may result in removal of your business enterprise from the Certification Directory and possible revocation of certification of your business enterprise as an M/WBE.

Please be aware that your M/WBE **Certification is valid for a period of one (1) year, and must be renewed annually**. It is your responsibility to request and submit a renewal application and all of the documents required within the renewal application in order for your renewal to be processed. Your application and accompanying documents should be sent electronically to our office at least thirty (30) days prior to the expiration date of your M/WBE Certification.

You may visit www.work4denver.com to view upcoming Construction/Professional Service bidding opportunities, or www.denvergov.org/purchasing for upcoming Goods & Services bid opportunities. This letter must be attached to your Letter of Intent (LOI) for bidding opportunities in which you may be utilized for goal participation.

Sincerely,

A handwritten signature in black ink, appearing to read "Tanya Davis", with a long horizontal flourish extending to the right.

Tanya Davis
Director

Letter of Intent (LOI) Checklist

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

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

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

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



Joint Venture Affidavit

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

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

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

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

Name of Firm: _____		
Print Name: _____	Title _____	
Signature: _____	Date: _____	
Notary Public		
County of _____	State of _____	My Commission Expires: _____
Subscribed and sworn before me this _____ day of _____, 20____		
Notary Signature: _____		
Notary Commission #: _____		
Address: _____		



JOINT VENTURE ELIGIBILITY FORM

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

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

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

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

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

Joint Venture Information

Name: _____ Contact Person: _____

Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

Joint Venture Participants

Name: _____ Contact Person: _____

Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

% Ownership: _____ Certifying Entity: _____ Type Certification & Date: (S/E/M/W or DBE)

Type of Work for which Certification was granted: _____

Name: _____ Contact Person: _____

Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

% Ownership: _____ Certifying Entity: _____ Type Certification & Date: (S/E/M/W or DBE)

Type of Work for which Certification was granted: _____

General Information

SBE/EBE/MBE/WBE/DBE Initial Capital Contributions: \$ _____ %

Future capital contributions (explain requirements) (attach additional sheets if necessary):

--	--

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

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

--	--

Describe the portion of the work or elements of the business controlled by non-SBE/EBE/MBE/WBE or DBE: (attach additional sheets if necessary)
JOINT VENTURE ELIGIBILITY FORM
General information
Describe the SBE/EBE/MBE/WBE or DBE's involvement in the overall management of the joint venture (e.g., participation on a management committee or managing board voting rights, etc.) (attach additional sheets if necessary)
Describe the SBE/EBE/MBE/WBE or DBE's share in the profits of the joint venture:
Describe the SBE/EBE/MBE/WBE or DBE's share in the risks of the joint venture:
Describe the roles and responsibilities of each joint venture participant with respect to managing the joint venture (use additional sheets if necessary):
a. SBE/EBE/MBE/WBE or DBE joint venture participant:
b. Non- SBE/EBE/MBE/WBE or DBE joint venture participant:
Describe the roles and responsibilities of each joint venture participant with respect to operation of the joint venture (use additional sheets if necessary):
a. SBE/EBE/MBE/WBE or DBE joint venture participant:
b. Non- SBE/EBE/MBE/WBE or DBE joint venture participant:

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

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

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

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

JOINT VENTURE ELIGIBILITY FORM

General Information

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

Who will they be employed by?

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

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

Number of employees	Position	Employed By

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

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

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

COMP-FRM-015

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

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT Sturgeon Electric Company, Inc., as Principal, and Liberty Mutual Insurance Company, a corporation organized and existing under and by virtue of the laws of the State of Massachusetts and authorized to do business within the State of Colorado, as Surety, are held and firmly bound unto the City and County of Denver, Colorado, as Oblige, in full and just sum of five percent of the accompanying bid amount Dollars, (\$ 5%), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents:

WHEREAS, the said Principal is herewith submitting its bid, dated December 19, 2019, for the construction of: Contract No. 201952606, Yale Station Pedestrian Safety, as set forth in detail in the Contract Documents for the City and County of Denver, Colorado, and said Oblige has required as a condition for receiving said bid that the Principal deposit specified bid security in the amount of not less than five percent (5%) of the amount of said bid, as it relates to work to be performed for the City, conditioned that in event of failure of the Principal to execute the Contract, for such construction and furnish required Performance and Payment Bond if the contract is offered him that said sum be paid immediately to the Oblige as liquidated damages, and not as a penalty, for the Principal's failure to perform.

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

Signed, sealed and delivered this 19th day of December, 2019.

ATTEST

[Signature]
Secretary

Sturgeon Electric Company, Inc.
Principal
By [Signature]
Krysta Brewer
Title Assistant Secretary

Liberty Mutual Insurance Company

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

Surety
By [Signature]
Sheree Hsieh, Attorney-in-Fact
[SEAL]

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Not valid for mortgage, note, loan, letter of credit, bank deposit, currency rate, interest rate or residual value guarantees. To confirm the validity of this Power of Attorney call 610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Michael M. Bill, Michael H. Bill, Edward L. Mounighan, Cynthia L. Jenkins, Ginger J. Krahn, Brenda Johnston, Cindy Stellhorn, Sheree Hsieh, Rebecca A. Virt, Kimberly E. Kinkead, Michael J. Marsella of the city of Indianapolis, state of Indiana its true and lawful attorney-in-fact, with full power and authority hereby conferred to sign, execute and acknowledge the following surety bond:

Principal Name: Sturgeon Electric Company, Inc.
Obligee Name: City and County of Denver
Surety Bond Number: n/a Bond Amount: five percent of the accompanying bid amount (5%)

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 7th day of December, 2017.



The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 7th day of December, 2017, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 19th day of December, 2019.



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary



Office of Economic Development
 Division of Small Business Opportunity
 201 W. Colfax Ave, Dept. 907
 Denver, CO 80202
 p: 720.913.1888
 f: 720.913.1809
www.denvergov.org/dsbo

Diversity and Inclusiveness * in City Solicitations Information Request Form

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

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

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

Business Email Address: ccervera@myrgroup.com

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

Agency Name:

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

Project Name: Yale Station Pedestrian Safety

BID / RFP No.: 201952606

Name of Contractor/Consultant: Sturgeon Electric Company, Inc.

What industry is your business? Electrical Contractor

Address:
12150 East 112th Ave
Henderson, CO 80640

Business Phone No.: 303-286-8000

Business Facsimile No.: 303-286-1811

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

1. How many employees does your company employ?

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

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

Full-time 100% Part-Time _____

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

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

If Yes, does it address:

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

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

See Attached Supplier Diversity Program and Equal Opportunity Employment Policy

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

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

- Employee Training
- Pamphlets
- Public EEO postings
- Other
- Not Applicable

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

N/A

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

- Monthly Annually
 Quarterly Not Applicable Other As Needed

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

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

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

See Attached Supplier Diversity Program & Equal Opportunity Employment Policy

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

8.1 If Yes, how often does it meet?

- Monthly Annually No Committee
 Quarterly Other _____

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

None

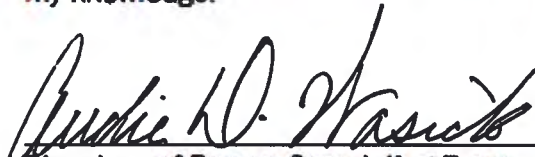
9. Do you have a budget for diversity and inclusiveness efforts? Yes No

10. Does your company integrate diversity and inclusion competencies into executive/manager performance evaluation plans? Yes No

11. Would you like information detailing how to implement a Diversity and Inclusiveness program? Yes No

If yes, please email X0101@denvergov.org.

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



Signature of Person Completing Form

Dec. 19, 2019

Date

Audia Wasick, Administrative Assistant

Printed Name of Person Completing Form

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

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

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Bid Documents Package

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS


TABLE OF CONTENTS FOR CONTRACT DOCUMENTS

BID FORM AND SUBMITTAL PACKAGE	<u>PAGE</u>
Bid Form and Submittal Package (bound separately and attached as part of these Bid Documents)	
Table of Contents	BF-1
Bidder's Checklist	BF-2 through BF-3
Bid Form and Submittal Package Acknowledgment Form	BF-4 through BF-5
Bid Form	BF-6 through BF-8
List of Proposed Minority/Women Business Enterprise(s)	BF-9 through BF-12
Commitment to Minority/Women Business Enterprise Participation	BF-13
Minority/Women Business Enterprise Letter(s) of Intent & Checklist	BF-14 through BF-15
Joint Venture Affidavit	BF-16
Joint Venture Eligibility Form	BF-17 through BF-19
Bid Bond	BF-20
Diversity and Inclusiveness in City Solicitations Form	BF-21 through BF-24
 BID DOCUMENTS	
Table of Contents	BDP-1
Statement of Quantities	SQ-1 through SQ-4
Notice of Invitation for Bids	BDP-2 through BDP-3
Instructions to Bidders	BDP-4 through BDP-16
Equal Employment Opportunity Provisions	BDP-17 through BDP-26
Appendix A	
Appendix F	
Contract Form	BDP-27 through BDP-31
Index of the General Contract Conditions	BDP-32 through BDP-36
Special Contract Conditions	BDP-37 through BDP-54
Final/Partial Release and Certificate of Payment Forms (Samples)	BDP-41 through BDP-42
Performance and Payment Bond Form	BDP-48 through BDP-49
Performance and Payment Bond Surety Authorization letter (Sample)	BDP-50
Notice to Apparent Low Bidder (Sample)	BDP-51 through BDP-52
Notice to Proceed (Sample)	BDP-53
Certificate of Contract Release (Sample)	BDP-54
Prevailing Wage Rate Schedule	7 pages
 <u>TECHNICAL SPECIFICATIONS</u>	
Special Provisions	126 Pages
Contract Drawings	26 Pages



STATEMENT OF QUANTITIES

Item No.	Description	Estimated	Quantity
201-00000	Clearing and Grubbing	1	LS
202-00195	Removal of Median Cover	2	SY
202-00200	Removal of Sidewalk	17	SY
202-00203	Removal of Curb and Gutter	39	LF
202-00206	Removal of Concrete Curb Ramp	5	SY
202-00220	Removal of Asphalt Mat	56	SY
202-00240	Removal of Asphalt Mat (Planing)	276	SY
202-00250	Removal of Pavement Marking	1,041	SF
203-00100	Muck Excavation	10	CY
202-00810	Removal of Ground Sign	1	EA
203-01597	Potholing	75	HR
203-02330	Laborer	40	HR
208-00035	Aggregate Bag	30	LF
208-00045	Concrete Washout Structure	1	EA
208-00051	Storm Drain Inlet Protection (Type 1)	3	LF
208-00205	Erosion Control Supervisor	40	HR
210-00861	Reset Wiring - Fiber Optic	1	LS
210-04010	Adjust Manhole	1	EA
214-00000	Landscape Maintenance	1	LS
214-00145	Plant Protect Fence	60	LF




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

Item No.	Description	Estimated	Quantity
304-06007	Aggregate Base Course (Class 6)	10	CY
403-00721	Hot Mix Asphalt (Patching) (Asphalt)	56	SY
403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)	40	TON
412-00190	Concrete Pavement (Patching)	6	SY
412-00600	Concrete Pavement (6 Inch)	3	SY
503-00024	Drilled and Vacuumed Caisson (24 Inch)	7	LF
503-00036	Drilled and Vacuumed Caisson (36 Inch)	39	LF
607-11580	Construction Limit Fencing	25	LF
608-00010	Concrete Curb Ramp	32	SY
608-00015	Detectable Warnings	44	SF
609-21010	Curb and Gutter Type 2 (Section I-B) (6" Curb and Gutter - 1' Spill Pan)	188	LF
609-21020	Curb and Gutter Type 2 (Section II-B) (6" Curb and Gutter - 2' Catch/Spill Pan)	31	LF
610-00030	Median Cover Material (Concrete - 6 Inch)	480	SF
613-XXXXX	Electric Meter Pedestal Cabinet and Base	1	EA
613-00206	2 Inch Electrical Conduit (Bored)	195	LF
613-00306	3 Inch Electrical Conduit (Bored)	365	LF
613-01200	2 Inch Electrical Conduit (Plastic)	115	LF
613-01300	3 Inch Electrical Conduit (Plastic)	185	LF



STATEMENT OF QUANTITIES

Item No.	Description	Estimated	Quantity
613-07000	Pull Box (Special)	3	EA
613-07002	Type Two Pull Box	4	EA
613-07003	Type Three Pull Box	5	EA
613-10000	Wiring	1	LS
613-13000	Luminaire (LED)	4	EA
614-00011	Sign Panel (Class I)	38	SF
614-00012	Sign Panel (Class II)	28	SF
614-00216	Steel Sign Post (2x2 Inch Tubing)	23	LF
614-70150	Pedestrian Signal Face (16) (Countdown)	4	EA
614-70336	Traffic Signal Face (12-12-12)	8	EA
614-70448	Traffic Signal Face (12-12-12-12)	2	EA
614-72855	Traffic Signal Controller and Cabinet	1	EA
614-72860	Pedestrian Push Button	3	EA
614-72863	Pedestrian Push Button Post Assembly	2	EA
614-72866	Fire Preemption Unit and Timer	3	EA
614-72895	Intersection Detection System (FLIR Camera)	2	EA
614-81000	Traffic Signal-Light Pole Steel	1	EA
614-81120	Traffic Signal-Light Pole Steel (1-20 Foot Mast Arm)	2	EA
614-81140	Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm)	1	EA
614-86105	Telemetry (Field)	1	EA



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

Item No.	Description	Estimated	Quantity
614-86800	Uninterrupted Power Supply	1	EA
614-87333	Closed Circuit Television Camera (Traffic Monitoring)	1	EA
614-87690	Ethernet Managed Switch	1	EA
623-00000	Mobilization	1	LS
625-00000	Construction Surveying	1	LS
627-00005	Epoxy Pavement Marking	6	GAL
627-30405	Preformed Thermoplastic Pavement Marking (Word-Symbol)	47	SF
627-30410	Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	339	SF
629-01001	Survey Monument (Type 1)	3	EA
630-XXXXXX	Construction Traffic Control	1	LS
630-00003	Uniformed Traffic Control	16	HR
700-70082	Force Account - Furnish & Install Electrical Service	1	FA
700-70589	Force Account - Environmental Health & Safety Management	1	FA

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

**NOTICE FOR INVITATION FOR BIDS
FOR CONTRACT NO. 201952606**

YALE STATION PEDESTRIAN SAFETY

**BID SCHEDULE:
11:00 AM, LOCAL TIME
DECEMBER 19, 2019**

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

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

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

GENERAL STATEMENT OF WORK:

This project includes the installation of a new traffic signal at E Yale Ave and E Yale Circle, an approximately 95' long concrete median, rebuilt curb ramp (removal of existing and installation of realigned new), full-depth patching of asphalt pavement, milling of asphalt pavement, an overlay of asphalt paving, and associated signing and striping.

ABOUT ELEVATE DENVER BOND PROGRAM:

Elevate Denver is a 10-year, \$937 million general obligation bond program approved by voters in 2017, that will enhance the City and County of Denver by providing critical improvements to the city's infrastructure – improving our roads, sidewalks, parks, recreation centers, libraries, cultural centers, public-owned buildings and safety facilities.

ESTIMATED CONSTRUCTION COST:

The estimated cost of construction for this project is between \$410,000.00 and \$510,000.00.

TEXTURA CONSTRUCTION PAYMENT MANAGEMENT:

Bidders are required, when preparing a bid, to agree it shall use the Textura® Construction Payment Management System ("Textura") to request payment from the City and to pay subcontractors. All certified subcontractors or suppliers who are listed for participation towards any assigned program goal must be paid via Textura. All fees associated with Textura are to be paid by the awarded Contractor. Bidders shall use the pricing scale provided in Instructions to Bidders to price the Textura service appropriately. For details on the company and service, contact the Textura® Corporation at 866-TEXTURA or www.texturacorp.com.

DOCUMENTS AND BID INFORMATION AVAILABLE:

Contract Documents complete with Technical Specifications and, if applicable, construction drawings will be available on the first day of publication at: www.work4denver.com. To download digital Contract Documents at a cost of \$15 per download, reference eBid Document Number #6585544. 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 10:00 AM, local time, on November 26, 2019. This meeting will take place at: WEBB Building, 201 W. Colfax Ave., 4th Floor Conference Room 4.I.4, Denver, Colorado 80202.

DEADLINE TO SUBMIT QUESTIONS: December 3, 2019 by 10:00 AM local time.

MINORITY/WOMEN BUSINESS ENTERPRISE PARTICIPATION:

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

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

15% Minority/Women Business Enterprise (M/WBE) Participation

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

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

MISCELLANEOUS:

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

City contracts are subject to payment of City Minimum Wage established pursuant to Section 20-82 through 20-84 D.R.M.C.

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

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

Publication Dates: November 19, 20, 21, 2019
Published In: The Daily Journal

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

INSTRUCTIONS TO BIDDERS

IB-1 INSTRUCTION TO BIDDERS

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

IB-2 BIDDING

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

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

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

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

IB-3 CONTRACT DOCUMENTS AS PUBLISHED BY CITY

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

IB-4 COMPLETING AND SIGNING THE BID FORMS

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

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

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

IB-5 UNACCEPTABLE BIDS

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

IB-6 INFORMAL AND UNBALANCED BIDS

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

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

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

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

IB-7 ONLY ONE BID ACCEPTED

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

IB-8 BID GUARANTEE

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

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

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

IB-9 SITE INSPECTION AND INVESTIGATIONS

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

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

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

IB-10 INCONSISTENCIES

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

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

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

IB-11 WITHDRAWAL OF BID

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

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

IB-12 CONTRACTOR'S BULLETIN BOARD

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

IB-13 PRE-BID MEETING

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

IB-14 ADDENDA

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

IB-15 BID OPENING

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

IB-16 EVALUATION OF BIDS AND BASIS OF BID SELECTION

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

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

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

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

IB-17 NOTICE TO APPARENT LOW BIDDER

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

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

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

IB-18 EXECUTION OF CONTRACT

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

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

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

IB-19 BONDING REQUIREMENTS

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

IB-20 INSURANCE REQUIREMENTS

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

IB-21 PERMITS AND LICENSES

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

IB-22 PREVAILING WAGE REQUIREMENTS

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

Date bid or request for qualifications/proposals was advertised: November 19, 2019.

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

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

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

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

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

IB-23 PAYMENT OF CITY MINIMUM WAGE

Contractor shall comply with, and agrees to be bound by, all requirements, conditions, and City determinations regarding the City's Minimum Wage Ordinance, Sections 20-82 through 20-84 D.R.M.C., including, but not limited to, the requirement that every covered worker shall be paid no less than the City Minimum Wage in accordance with the foregoing D.R.M.C. Sections.

Instances in which a worker is covered by both Prevailing Wage rate requirements and City Minimum Wage rate requirements, Contractor shall pay every covered worker the greater of the two.

The services being requested in this solicitation may involve services that are covered pursuant to Division 3.75 of Article IV of Chapter 20 of the Denver Revised Municipal Code ("D.R.M.C."), which is designed to address the issue of wage equity and cost of living affordability in the City & County of Denver. Contractor agrees that any contract with the City shall include a requirement that Contractor will comply with the provisions of D.R.M.C. §§20-82 through 20-84, including, but not limited to, paying all covered workers no less than the City Minimum Wage for all covered services rendered in connection with the Contract. Additionally, Contractor agrees that the contract shall require compliance with all current and future federal and state laws and City ordinances.

IB-24 TAX REQUIREMENTS

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

Sales and Use Tax. The City of Denver imposes consumer use tax on all construction and building materials used on any construction project located in Denver. Denver does not exempt governmental or charitable projects.

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 include Denver sales/use tax, Occupational Privilege taxes, and 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 \$500 or more working in Denver during a calendar month, is subject to the payment of the Employee Occupational Privilege Tax. The Contractor and any subcontractor must pay the Business Occupational Privilege Tax for each of its employees who are subject to such tax.

IB-25 DIVERSITY AND INCLUSIVENESS IN CITY SOLICITATIONS

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

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

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

IB-26 MINORITY/WOMEN BUSINESS ENTERPRISE (M/WBE) REQUIREMENTS

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

Meeting Established Goal

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

1. Under the M/WBE Ordinance, the Director of DSBO (“Director”) is directed to establish project goals for expenditures on construction, reconstruction, and remodeling work performed for the City and County of Denver. The specific goal for this project is stated in the Notice of Invitation for Bids bound herein.
2. In preparing its bid, each bidder shall list on the Bid Form pages entitled “List of Proposed MWBE Bidders, Subcontractors, Suppliers, Manufacturers, Manufacturers’ Representatives or Brokers” the name, address, work description/supply, committed level of participation and other required information for each M/WBE of any tier which the bidder intends to use in performing the work on this Project. **Only the M/WBEs identified and the precise levels of participation listed for each on the Bid Form page, at the time of bid opening, will be considered in determining whether the bidder has met the designated participation goal. Additional, revised or corrected participation submitted after bid opening will not be considered.** M/WBE bidders may count self-performance or joint venture activity in meeting the M/WBE project goal, but only for the scope of work performed as a commercially useful function and at a percentage level the M/WBE will be performing itself.

3. Any agreement between a bidder or proposer and an MBE or WBE in which the bidder or proposer requires that the MBE or WBE not provide subcontracting quotations to other bidders or proposers is prohibited and shall render a bidder's bid or proposer's proposal nonresponsive. D.R.M.C. 28-63(f)
4. If a bidder/proposer is participating in a joint venture with a certified M/WBE firm, complete the Joint Venture Eligibility Form and Joint Venture Affidavit contained in this bid document/RFP. Submit the aforementioned forms with the firm's Joint Venture Agreement, to the DSBO Director, **at least 10 working days prior to the proposal submittal**. The Joint Venture must be approved prior to the bid opening or proposal submittal by the DSBO Director. Approval by the DSBO Director includes determining the amount the Joint Venture will count towards meeting the project goal.
5. All M/WBEs listed on the Bid Form must be properly certified by the City on or before the date bids are opened in order to count towards meeting the designated goal. DSBO maintains an M/WBE Directory ("Directory"), which is a current listing of M/WBEs that have been certified by the City. A copy of the DSBO Directory is located at DSBO web site at <https://www.denvergov.org/dsbo>. Bidders are encouraged to use the Directory to assist in locating M/WBEs for the work and supplies required on the Project. Bidders are reminded that changes may be made to the Directory at anytime in accordance with the City's M/WBE Ordinance and procedures established to administer this program and a current copy of the Directory must always be used in preparing a bid. M/WBE certification or listing in the Directory is not a representation or warranty by the City as to the qualifications of any listed M/WBE.
6. In accordance with the provisions of the M/WBE Ordinance, DSBO will evaluate each bid to determine the responsiveness of the bid to the requirements of the M/WBE Ordinance. In determining whether a bidder's committed level of participation meets or exceeds the stated M/WBE goal, DSBO shall base its calculation of applicable amounts and percentages on the total base bid amount, not including any listed alternates, of each bid as follows:
 - a. The bid information provided by the agency will be used to determine the total base bid amount of each bid. Each bidder's total base bid amount will be multiplied by the M/WBE percentage established for the project to determine the exact dollar amount of required M/WBE participation for the Project. This amount will then be compared against the exact dollar amounts for the M/WBE committed for participation by the bidder. If the total dollar amount of participation listed meets or exceeds the established M/WBE dollar amount goal listed, then DSBO will determine that the goal has been met.
 - b. In addition, DSBO will determine the exact commitment percentage for each listed M/WBE by dividing the dollar amount listed for each M/WBE by the total base bid dollar amount submitted by the bidder. These individual percentages, when totaled for all listed M/WBE, will establish the total committed percentage level of M/WBE participation that the bidder must comply with during the life of the contract. In all cases, the committed percentage level of M/WBE participation must equal or exceed the assigned M/WBE goal for the Project.
 - c. In providing the exact dollar amount of participation for each listed M/WBE, a bidder should take care never to round up in determining whether or not the total of these amounts meets or exceeds the established percentage goal. The goal must be met or exceeded by dollar amounts and percentages in order for DSBO to determine that the bidder has met or exceeded the applicable M/WBE goal.
 - d. As previously mentioned, compliance with the M/WBE goal will be determined on the base bid alone. If a bid contains alternates, participation contained in any alternate will not count towards satisfaction of the Project goal. However, should any designated alternate be selected by the City for inclusion in the contract ultimately awarded, the M/WBE goal percentage level submitted at bid time, on the base bid, will also apply to the selected alternates and must be maintained for the life of the contract on the total contract amount,

including any alternate work. Thus, even though such participation will not be considered in evaluating bids, bidders are urged to consider participation in preparing bids for designated alternates.

- d. On projects where force account or allowance bid items have been included, bidders must meet the M/WBE goal percentage based upon the total base bid, including all such items that are submitted to the City. However, when a force account or allowance is designated by the City to be either performed or purchased from a specific company, the bidder may back out the dollar amount of the force account or allowance from the total base bid and meet the M/WBE goal on the remaining reduced amount.
 - e. On bids which, at the time of bid opening, are equal to or exceed Five Million Dollars (\$5,000,000.00), including any alternates which may be selected, only sixty percent (60%) of the value of the commercially useful function performed by M/WBE suppliers shall count toward satisfaction of the Project goal. On Projects under Five Million (\$5,000,000.00) the value of the commercially useful function of M/WBE supplier(s) will count at a one hundred percent (100%) level. Manufacturer's representatives and packagers shall be counted in the same manner as brokers.
 - f. In utilizing the M/WBE participation of a Broker only the bona fide commissions earned by such Broker for its performance of a commercially useful function will count toward meeting the Project goals. The bidder must separate the bona fide brokerage commissions from the actual cost of the supplies or materials provided to determine the actual dollar amount of participation that can be counted towards meeting the goal.
7. On or before the third (3rd) working day after bid opening, all of the Bidders are required to submit an executed "Letter of Intent" for each M/WBE listed on the Bid Form as a joint venture member, subcontractor, supplier, manufacturer, manufacturers' representative or broker of any tier. **An MBE or WBE Prime Bidder needs to submit a Letter of Intent for itself for self-performed work**, and must identify their level of participation on the designated M/WBE participation page bound herein. A Letter of Intent shall be submitted only for the M/WBEs listed at the time of bid opening, since this is the only participation that will be counted toward satisfaction of the project goal. A form for the M/WBE Letter of Intent is included with the Bid Form. The M/WBE Letter of Intent is a written communication from the Bidder to the City evidencing an understanding that the Bidder has or will enter into a contractual relationship with the M/WBE or that its subcontractor(s) and supplier(s), manufacturer(s), manufacturers' representative(s) and broker(s) will do so. Each M/WBE Letter of Intent shall be accompanied by a copy of the City and County of Denver's M/WBE certification letter for each proposed M/WBE identified at bid time. Bidders are urged to carefully review these Letters before submission to the City to ensure that they are properly completed and executed by the appropriate parties.

Good Faith Effort

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

1. If the bidder or proposer has not fully met the project goal as provided in section 28-60, then it shall demonstrate that it has made good faith efforts to meet such goal. The bidder or proposer shall furnish to the director, within three (3) working days after bid opening by the City or on or before the time of the final project-specific proposal submitted to and authorized by the City pursuant to a competitive selection process, or bid selection by a private owner, a detailed statement of its good faith efforts to meet the project goal set by the director. This statement shall address each of the items in subsection (b) and any additional criteria that the director may establish by rule or regulation consistent with the purposes of this division 3. Good faith efforts must be demonstrated to be meaningful and not merely for formalistic compliance with this Division 3. The scope and intensity of the efforts will be considered in determining whether the bidder or proposer has achieved a good faith effort.

2. The statement of good faith efforts shall include a specific response and verification with respect to each of the following good faith effort categories, which may be further defined by rule or regulation. A bidder or proposer may include any additional information it believes may be relevant. Failure of a bidder or proposer to show good faith efforts as to any one (1) of the following categories shall render its overall good faith effort showing insufficient and its bid or proposal non-responsive:
 - a. If prebid or preselection meetings are scheduled by the City at which MBEs and WBEs may be informed of subcontracting or joint venture opportunities under a proposed contract to be bid, or procured pursuant to the competitive selection process, attendance at such prebid or preselection meetings is not mandatory; however, bidders and proposers are responsible for the information provided at these meetings.
 - b. The bidder or proposer must solicit through all reasonable and available means, the interest of all MBEs and WBEs certified in the scopes of work of the contract. The bidder or proposer must solicit the interest of such MBEs and WBEs within sufficient time, prior to the bid opening or date of final project-specific proposal in the case of a competitive selection process, to allow such MBEs and WBEs to respond to the solicitation. The bidder or proposer must determine with certainty if the MBEs and WBEs are interested by demonstrating appropriate steps to follow up initial solicitations.
 - c. The bidder or proposer must select portions of the work of the contract to be performed by MBEs and WBEs in order to increase the likelihood that the project goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MBE and WBE participation as subcontractors or joint venturers, and for bidder or proposer self-performed work, as suppliers, manufacturers, manufacturer's representatives and brokers, all reasonably consistent with industry practice, even when the bidder or proposer would otherwise prefer to perform these work items with its own forces. The bidder or proposer must identify what portions of the contract will be self-performed and what portions of the contract will be opened to solicitation of bids, proposals and quotes from MBE and WBEs. All portions of the contract not self-performed must be solicited for MBE and WBE participation. The ability or desire of a bidder or proposer to perform the work of a contract with its own forces does not relieve the bidder or proposer of the responsibility to meet the project goal or demonstrate good faith efforts to do so.
 - d. The bidder or proposer, consistent with industry practice, must provide MBEs and WBEs at a clearly stated location with timely, adequate access to and information about the plans, specifications, and requirements of the contract, including bonding and insurance requirements, if any, to assist them in responding to a solicitation.
 - e. The bidder or proposer must negotiate in good faith with interested MBEs and WBEs and provide written documentation of such negotiation with each such MBE or WBE.
 - f. For each MBE or WBE which contacted the bidder or proposer or which the bidder or proposer contacted or attempted to subcontract or joint venture with, consistent with industry practice, the bidder or proposer must supply a statement giving the reasons why the bidder or proposer and the MBE or WBE did not succeed in negotiating a subcontracting, supplier, manufacturer, manufacturer's representative, broker or joint venture agreement, as applicable.
3. The bidder or proposer must provide verification that it rejected each non-utilized MBE and WBE because the MBE or WBE did not submit the lowest bid or it was not qualified. Such verification shall include a verified statement of the amounts of all bids received from potential or utilized subcontractors, suppliers, manufacturers, manufacturer's representatives, brokers or joint venturers on the contract, whether or not they are MBEs or WBEs. In making such a determination of not being qualified, the bidder or proposer shall be guided by the definition of qualified in section 28-54(42), but evidence of lack of qualification must be based on factors other than solely the amount of the MBE's or WBE's bid. For each MBE or WBE found not to be qualified by the bidder or

proposer, the verification shall include a statement giving the bidder's or proposer's reasons for its conclusion. A bidder's or proposer's industry standing, or group memberships may not be the cause of rejection of an MBE or WBE. A bidder or proposer may not reject an MBE or WBE as being unqualified without sound reasons based on a reasonably thorough investigation and assessment of the MBE's or WBE's capabilities and expertise.

4. If requested by a solicited MBE or WBE, the bidder or proposer must make reasonable efforts to assist interested MBEs and WBEs in obtaining bonding, lines of credit, or insurance as required by the City or by the bidder or proposer, provided that the bidder or proposer need not provide financial assistance toward this effort.
5. If requested by a solicited MBE or WBE, the bidder or proposer must make reasonable efforts to assist interested MBEs and WBEs in obtaining necessary and competitively priced equipment, supplies, materials, or related assistance or services for performance under the contract, provided that the bidder or proposer need not provide financial assistance toward this effort.
6. The bidder or proposer must use the DSBO MBE/WBE directories to identify, recruit, and place MBEs and WBEs.
7. In determining whether a bidder or proposer has satisfied good faith efforts as to a project goal, the success or failure of other bidders or proposers on the contract in meeting such project goal may be considered.

Continuing Commitments

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

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

All bidders are charged with knowledge of and are solely responsible for complying with each and every provision of the M/WBE Ordinance in making a bid and, if awarded, in performing the work described in the Contract Documents.

Failure to comply with these provisions could constitute cause for rejection of a bid or subject the selected contractor to sanctions set forth in the M/WBE Ordinance. These instructions are intended only to generally assist the bidder in preparing and submitting a compliant bid. Should any questions arise regarding specific circumstances, bidders must consult the M/WBE Ordinance or contact the Project's designated DSBO representative at (720) 913-1999.

IB- 27 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-28 GENERAL BIDDING INFORMATION

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

IB-29 PAYMENT PROCEDURE REQUIREMENTS

Bidder recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System ("Textura") for this Project to request payment from the City and to pay subcontractors. All certified subcontractors or suppliers who are listed for participation towards any assigned program goal must be paid via Textura. All fees associated with Textura are to be paid by the bidder for billings for work performed. Bidders are required, when preparing a bid, to enter the price of Textura on the line provided for the service. The fee is all inclusive of all subcontractor, project and subscription fees associated with Textura. The bidder will calculate the fee based on their total bid (not including any alternates, if applicable) and the table below, and then include it on the line item provided in the bid form labeled "**Textura® Construction Payment Management System Fee**". This expense becomes part of the contract and billable to the City. All costs including, but not limited to, costs associated with training, entering data, and/or utilizing Textura other than the Textura Construction Payment Management System Fee are overhead and shall not be reimbursed by the City. Bidder will be responsible for any tax on the Textura fee. As with other taxes, the City will not reimburse bidder for this cost and therefore this cost should be included in bidder's bid. Textura will invoice the awarded bidder directly.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

Project Value	Project Fee (GC + Sub Usage)
\$100,000 – 249,999.99	\$780
\$250,000 - \$499,999.99	\$1,625
\$500,000 - \$999,999.99	\$3,250
\$1,000,000 - \$2,999,999.99	\$5,850
\$3,000,000 - \$4,999,999.99	\$9,100
\$5,000,000 - \$9,999,999.99	\$12,220
\$10,000,000 - \$19,999,999.99	\$20,345
\$20,000,000 - \$49,999,999.99	\$32,500
\$50,000,000 - \$99,999,999.99	\$48,750
\$100,000,000 - \$199,999,999.99	\$69,095
\$200,000,000 - \$299,999,999.99	\$85,345
\$300,000,000 - \$399,999,999.99	\$109,720
\$400,000,000 - \$499,999,999.99	\$142,220
\$500,000,000 - \$999,999,999.99	\$162,500
\$1,000,000,000 - \$1,999,999,999.99	\$345,345
\$2,000,000,000 - \$4,999,999,999.99	\$650,000
\$5,000,000,000 - \$9,999,999,999.99	\$1,015,625
\$10,000,000,000 or greater	\$1,503,125

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

**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**

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.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

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

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 Division of Small Business Opportunity (DSBO). The contractor's commitment to the goals for minority, and female utilization as required constitutes a commitment that it will make every good faith effort to meet such goals.

1. GOALS AND TIMETABLES:

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

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

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

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

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

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

2. SPECIFIC AFFIRMATIVE ACTION STEPS:

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

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

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

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

3. NON - DISCRIMINATION:

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

4. COMPLIANCE AND ENFORCEMENT:

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

B. CONTRACTORS SUBJECT TO THESE BID CONDITIONS:

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

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

C. OBLIGATIONS APPLICABLE TO CONTRACTORS:

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

D. GENERAL REQUIREMENTS:

Contractors are responsible for informing their subcontractors in writing regardless of tier, as to their respective obligations. Whenever a Contractor subcontracts a portion of work in any trade covered by these Bid Conditions, **it shall include these Bid Conditions in such subcontracts and each subcontractor shall be bound by these Bid Conditions to the full extent as if it were the prime contractor.** The Contractor

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

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

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

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

CONTRACT NO. 201952606

YALE STATION PEDESTRIAN SAFETY

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

**STURGEON ELECTRIC COMPANY, INC.
12150 East 112th Avenue
Henderson, CO 80640**

WITNESSETH, commencing on **November 19, 2019**, and for at least three (3) days the City advertised that sealed bids would be received for furnishing all labor, tools, supplies, equipment, materials, and everything necessary and required for the following:

<p>CONTRACT NO. 201952606</p> <p>YALE STATION PEDESTRIAN SAFETY</p>

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

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

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

1. CONTRACT DOCUMENTS

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

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

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

2. SCOPE OF WORK

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

3. TERMS OF PERFORMANCE

The Contractor agrees to undertake the performance of the Work under this Contract within ten (10) days after being notified to commence work by issuance of a Notice to Proceed in substantially the form contained herein from the Manager and agrees to fully complete said Work within **150 (One Hundred and Fifty 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 201-00000 through 700-70589 (Seventy-One [71] total bid items, which includes two (2) Force Accounts, the total estimated cost thereof being Five Hundred Twenty-Eight Thousand Six Hundred Seventy-Six Dollars and Fifty Cents (528,676.50).** 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 work under this contract, the Contractor may not refuse to hire, discharge, promote or demote, or discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, gender, age, military status, sexual orientation, gender identity or gender expression, marital status, or physical or mental disability. The Contractor shall insert the foregoing provision in all subcontracts.

6. COMPLIANCE WITH M/WBE REQUIREMENT

This Contract is subject to all applicable provisions of Divisions 1 and 3 of Article III, of Chapter 28, Denver Revised Municipal Code (D.R.M.C.), designated as Sections 28-31 – 28-36 and 28-52 – 28-90 D.R.M.C. and referred to in this Contract as the "M/WBE Ordinance". Without limiting the general applicability of the foregoing, the Contractor acknowledges its continuing duty, pursuant to Sections 28-72, 28-73 and 28-75 of the D.R.M.C., to maintain throughout the duration of this Contract, compliance with the level of Minority/Women Business Enterprise participation, upon which the City approved the award of this Contract to the Contractor and the Contractor further acknowledges that failure to maintain such participation commitments or otherwise comply with the requirements of the M/WBE Ordinance shall subject the Contractor to sanctions in accordance with Section 28-77 of the D.R.M.C. Nothing contained in this

provision or in the M/WBE Ordinance shall negate the City's right to prior approval of subcontractors, or substitutes therefore, under this Contract.

7. WAGE RATE REQUIREMENTS

In performance of all Work hereunder, the Contractor agrees to comply with and be bound by all requirements and conditions of the City's Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. and any determinations made by the City pursuant thereto as well as the City's Minimum Wage Protections Sections 20-82 through 20-84 D.R.M.C. and any determinations made by the City pursuant thereto. In the event a covered worker falls under both ordinances, Contractor shall pay the greater of the two rates.

8. APPLICABILITY OF LAWS

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

9. APPROPRIATION

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

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

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

10. APPROVALS

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

11. ASSIGNMENT

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

12. DISPUTES RESOLUTION PROCESS

It is the express intention of the parties to this Contract that all disputes of any nature whatsoever regarding the Contract including, but not limited to, any claims for compensation or damages arising out of breach or default under this Contract, shall be resolved by administrative hearing pursuant to the provisions of Section 56-106, D.R.M.C., or, as applicable, Section 28-33 D.R.M.C. for Minority/Women 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 INTENTIONALLY LEFT BLANK

Contract Control Number: PWADM-201952606-00
Contractor Name: STURGEON ELECTRIC COMPANY, INC.

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:

Attorney for the City and County of Denver

By:

By:

By:

Contract Control Number:
Contractor Name:

PWADM-201952606-00
STURGEON ELECTRIC COMPANY, INC.

By:  _____
4C4B295C95074FA...

Name: Jim Bushnell
(please print)

Title: Vice President Colorado Transportation
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

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

General Contract Conditions

INDEX

TITLE 1

DEFINITIONS..... 1

101 CITY..... 1

102 CONTRACT..... 1

103 CONTRACT AMOUNT 1

104 CONTRACT DOCUMENTS 1

105 CONTRACT TIME..... 1

106 CONTRACTOR 2

107 CONTRACTOR PERSONNEL 2

108 DAYS 2

109 DEPUTY MANAGER 2

110 DESIGNER 2

111 FINAL COMPLETION..... 2

112 MANAGER..... 3

113 PRODUCT DATA 3

114 PROJECT 3

115 PROJECT MANAGER 3

116 SAMPLES 3

117 SHOP DRAWINGS 3

118 SUBCONTRACTOR 3

119 SUBSTANTIAL COMPLETION 3

120 SUPPLIER..... 4

121 WORK..... 4

TITLE 2

CITY ADMINISTRATIVE ORGANIZATIONS; LINE OF AUTHORITY 5

201 DEPARTMENT OF AVIATION..... 5

202 MANAGER OF AVIATION 5

203 DEPARTMENT OF PUBLIC WORKS..... 5

204 MANAGER OF PUBLIC WORKS 5

205 BUILDING INSPECTION..... 5

206 ZONING..... 5

207 DIVISION OF SMALL BUSINESS OPPORTUNITY..... 6

208 CITY AUDITOR..... 6

209 MANAGER OF FINANCE..... 6

210 CITY ATTORNEY 6

211 OFFICE OF RISK MANAGEMENT..... 6

212 CITY’S CONTRACT ADMINISTRATION LINE OF AUTHORITY 6

213 CITY’S COMMUNICATION WITH THE CONTRACTOR..... 7

TITLE 3

CONTRACTOR PERFORMANCE AND SERVICES..... 8

301 CONSIDERATION..... 8

 (CONTRACTOR’S PROMISE OF PERFORMANCE)..... 8

302 NOTICE TO PROCEED AND COMPLETION OF THE WORK 8

303 EXACT CONTRACTOR PERFORMANCE 8

304 SUBSTITUTED PERFORMANCE 8

305 WORK PERFORMED UNDER ADVERSE WEATHER CONDITIONS..... 9

306 WORKING HOURS AND SCHEDULE 9

307 CONTRACTOR’S SUPERINTENDENT 10

308 COMMUNICATIONS 10

309 CONTRACTOR SUBMITTALS AND OTHER WRITTEN COMMUNICATIONS TO THE CITY..... 10

310 COMPETENCE OF CONTRACTOR’S WORK FORCE 11

311 NO EMPLOYMENT OF ILLEGAL ALIENS TO PERFORM WORK UNDER THE CONTRACT 11

312 CONDUCT OF CONTRACTOR’S PERSONNEL 12

313 SUGGESTIONS TO CONTRACTOR..... 12

314 WORK FORCE 12

315 CONSTRUCTION MACHINES AND STANDBY EQUIPMENT 13

316 CUTTING AND PATCHING THE WORK..... 13

317 PERMITS AND LICENSES 13

318 CONSTRUCTION SURVEYS 14

319 PRESERVATION OF PERMANENT LAND SURVEY CONTROL MARKERS 14

320 TRADEMARKS, COPYRIGHTS AND PATENTED DEVICES, MATERIALS, AND PROCESSES 15

321 PROJECT SIGNS..... 15

322 PUBLICITY AND ADVERTISING 16

323 TAXES 16

324 DOCUMENTS AND SAMPLES AT THE SITE 17

325 CLEANUP DURING CONSTRUCTION..... 17

326 SANITARY FACILITIES..... 18

327 POWER, LIGHTING, HEATING, VENTILATING, AIR CONDITIONING AND WATER SERVICES 18

TITLE 4

CONTRACT DOCUMENTS (DRAWINGS AND TECHNICAL SPECIFICATIONS) 19

401 CONTRACT DOCUMENTS - REVIEW AND INTERPRETATION 19

402 OWNERSHIP OF CONTRACT DRAWINGS AND TECHNICAL SPECIFICATIONS..... 20

403 CONTRACT DRAWINGS AND TECHNICAL SPECIFICATIONS ISSUED TO THE CONTRACTOR 20

404 REQUESTS FOR INFORMATION OR CLARIFICATION 21

405 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 21

406 SUBSTITUTION OF MATERIALS AND EQUIPMENT 22

TITLE 5

SUBCONTRACTS 24

501 SUBCONTRACTS..... 24

502 SUBCONTRACTOR ACCEPTANCE 24

TITLE 6

TIME OF COMMENCEMENT AND COMPLETION 27

601 BEGINNING, PROGRESS AND TIME OF COMPLETION 27

602 LIQUIDATED DAMAGES; ADMINISTRATIVE COSTS; ACTUAL DAMAGES..... 27

603 DELAY DAMAGES 28

TITLE 7

COOPERATION, COORDINATION AND RATE OF PROGRESS 29

701 COOPERATION WITH OTHER WORK FORCES 29

702 COORDINATION OF THE WORK..... 30

703 COORDINATION OF PUBLIC CONTACT..... 30

704	RATE OF PROGRESS	30
TITLE 8		
PROTECTION OF PERSONS AND PROPERTY		32
801	SAFETY OF PERSONS	32
802	PROTECTIVE DEVICES AND SAFETY PRECAUTIONS	33
803	PROTECTION OF PROPERTY AND WORK IN PROGRESS	33
804	PROTECTION OF MUNICIPAL, PUBLIC SERVICE OR PUBLIC UTILITY SYSTEMS	34
805	PROTECTION OF STREET AND ROAD SYSTEM	35
806	PROTECTION OF DRAINAGE WAYS	36
807	PROTECTION OF THE ENVIRONMENT	36
808	HAZARDOUS AND EXPLOSIVE MATERIALS OR SUBSTANCES	37
809	ARCHAEOLOGICAL AND HISTORICAL DISCOVERIES	37
TITLE 9		
COMPENSATION		38
901	CONSIDERATION (CITY'S PROMISE TO PAY)	38
902	PAYMENT PROCEDURE	38
903	SCHEDULE OF VALUES IN LUMP SUM CONTRACTS	39
904	UNIT PRICE CONTRACTS	39
905	PROGRESS PERIOD	39
906	APPLICATIONS FOR PAYMENT	40
907	RELEASES AND CONTRACTORS CERTIFICATIONS OF PAYMENT	41
908	RETAINAGE	41
909	ADDITIONAL WITHHOLDING OF PROGRESS PAYMENTS	42
910	FINAL ESTIMATE AND PAYMENT	43
911	ACCOUNTING OF COSTS AND AUDIT	43
TITLE 10		
WAGE		45
1001	PREVAILING WAGE ORDINANCE	45
1002	POSTING OF THE APPLICABLE WAGE RATES	45
1003	RATE AND FREQUENCY OF WAGES PAID	45
1004	REPORTING WAGES PAID	45
1005	FAILURE TO PAY PREVAILING WAGES	46
TITLE 11		
CHANGES IN THE WORK, CONTRACT PRICE OR CONTRACT TIME		47
1101	CHANGE ORDER	47
1102	CITY INITIATED CHANGES	47
1103	CONTRACTOR CHANGE REQUEST	48
1104	ADJUSTMENT TO CONTRACT AMOUNT	51
1105	TIME EXTENSIONS	54
TITLE 12		
CONTRACTOR CLAIMS FOR ADJUSTMENT AND DISPUTES		56
1201	NOTICE OF INTENT TO CLAIM	56
1202	SUBMITTAL OF CLAIMS	56
1203	WAIVER OF CLAIMS	58
TITLE 13		
DISPUTES		59
1301	DISPUTES	59
TITLE 14		
SITE CONDITIONS		60

1401 DIFFERING SITE CONDITIONS.....60

1402 SITE INSPECTIONS AND INVESTIGATIONS60

TITLE 15

PERFORMANCE AND PAYMENT BONDS62

1501 SURETY BONDS62

1502 PERFORMANCE BOND62

1503 PAYMENT BOND.....62

TITLE 16

INSURANCE AND INDEMNIFICATION63

1601 INSURANCE63

1602 DEFENSE AND INDEMNIFICATION63

TITLE 17

INSPECTION AND DEFECTS64

1701 CONSTRUCTION INSPECTION BY THE CITY64

1702 AUTHORITY OF INSPECTORS64

1703 OBSERVABLE DEFECTS64

1704 DEFECTS - UNCOVERING WORK64

1705 LATENT DEFECTS65

1706 REMOVAL OF DEFECTIVE MATERIALS AND WORK65

TITLE 18

WARRANTIES, GUARANTEES AND CORRECTIVE WORK.....66

1801 CONTRACTOR’S WARRANTIES, GUARANTEES
AND CORRECTION OF WORK66

1802 PERFORMANCE DURING WARRANTY PERIOD67

TITLE 19

SUBSTANTIAL COMPLETION OF THE WORK.....69

1901 CONTRACTOR’S NOTICE OF SUBSTANTIAL COMPLETION69

1902 INSPECTION AND PUNCH LIST69

1903 CERTIFICATE OF SUBSTANTIAL COMPLETION69

1904 RIGHT OF EARLY OCCUPANCY OR USE69

TITLE 20

FINAL COMPLETION AND ACCEPTANCE OF THE WORK.....71

2001 CLEAN-UP UPON COMPLETION71

2002 FINAL COMPLETION AND ACCEPTANCE OF THE WORK71

2003 FINAL SETTLEMENT.....71

TITLE 21

SUSPENSION OF WORK.....74

2101 SUSPENSION OF WORK.....74

2102 SUSPENSION OF THE WORK FOR THE
CITY’S CONVENIENCE74

2103 SUSPENSION BECAUSE OF ORDER OF CITY, STATE
OR FEDERAL COURT OR AGENCY75

2104 SUSPENSION RESULTING FROM CONTRACTOR’S
FAILURE TO PERFORM.....75

TITLE 22

CITY’S RIGHT TO TERMINATE THE CONTRACT76

2201 TERMINATION OF CONTRACT FOR CAUSE76

2202 TERMINATION OF CONTRACT
FOR CONVENIENCE OF THE CITY77

TITLE 23

MISCELLANEOUS PROVISIONS80

2301 PARTIES TO THE CONTRACT.....80

2302 FEDERAL AID PROVISIONS.....80

2303 NO WAIVER OF RIGHTS80

2304 NO THIRD PARTY BENEFICIARY80

2305 GOVERNING LAW; VENUE.....81

2306 ABBREVIATIONS81

2307 STATUTE OF LIMITATIONS IN C.R.S. § 13-80-102(1)(h)81

CITY AND COUNTY OF DENVER
DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE

SPECIAL CONTRACT CONDITIONS

SC-1 CONSTRUCTION SPECIFICATIONS

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

City and County of Denver:

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

Transportation Standards and Details for the Engineering Division

City and County of Denver Traffic Standard Drawings

Wastewater Management Division

– *Standard Detail Drawings*

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

Colorado Department of Transportation:

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

Federal Highway Administration:

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

Building & Fire Codes:

Building Code of the City and County of Denver

(International Building Code 2015 Series, City and County of Denver Amendments 2016)

National Fire Protection Association Standards

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

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

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

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

SC-2 DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE (REPLACES GENERAL CONTRACT CONDITION 203)

As of January 1, 2020, the functions of Public Works are housed in the new Department of Transportation and Infrastructure. For purposes of this Contract all references (including, but not limited to, references appearing in the body of the contract, General Conditions, Special Conditions, Exhibits, Contract Documents or Policies and Procedures) to the Department of Public Works will have the same meaning as the Department of Transportation and Infrastructure.

Vested exclusively in the Department of Transportation and Infrastructure is the management and control of the design and construction of general and local public improvements undertaken by the City and County of Denver, except for: (i) work which is under the management and control of the Department of Aviation; (ii) that work performed by the Denver Board of Water Commissioners; (iii) any such work that the Mayor has specifically assigned to another department or agency; and (iv) work under the authority of the Department of Transportation and Infrastructure that is performed with the permission of the Manager of Transportation and Infrastructure by private entities at their own expense.

SC-3 DEPARTMENT OF PUBLIC WORKS (MODIFIES GENERAL CONTRACT CONDITION 204)

General Condition 204 is hereby deleted in its entirety and replaced with the following:

As of January 1, 2020, the functions of Public Works are housed in the new Department of Transportation and Infrastructure. The Manager of Public Works / Executive Director of Public Works will become the Executive Director of Transportation and Infrastructure. Manager of Public Works, Executive Director of Public Works, Executive Director of Transportation and Infrastructure and Manager of Transportation and Infrastructure will have the same meaning for purposes of this Agreement.

SC-4 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-5 ENGINEERING DIVISION / CITY ENGINEER

The Engineering Division is a unit of the Department of Transportation and Infrastructure and is supervised by the City Engineer, who is subordinate to the Manager of Transportation and Infrastructure. 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 the City Engineer, respectively.

SC-6 WASTEWATER MANAGEMENT DIVISION

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

SC-7 CITY DELEGATION OF AUTHORITY

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

Department of Transportation and Infrastructure:

<u>Project Manager</u>		<u>Telephone</u>
City Project Manager		
Todd Johnson		720.865.3120
<u>Consultant</u>	<u>Name</u>	<u>Telephone</u>
Design Consultant	Consultant Contact	
Jacobs	Candice De	720.286.3011

SC-8 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 **\$1,000.00** 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-9 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-10 RESERVED**SC-11 PAYMENTS TO CONTRACTORS**

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

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

<u>Agency/Firm</u>	<u>Name</u>	<u>Telephone</u>
Department of Transportation and Infrastructure	Todd Johnson	720.865.3120

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

1. The estimate of Work completed shall be based on the approved schedule of values or unit prices, as applicable, and the percent of the Work complete.
2. Each Application for Payment shall include each and every independent subcontractor's payroll information including pay dates and pay amounts.

3. The Contractor shall also submit to the Auditor and other appropriate officials of the City in a timely fashion, information required by General Contract Condition 1004, REPORTING WAGES PAID.
4. Applications for Payment must be accompanied by completed Partial or Final Claim Release Form, as appropriate, from EACH subcontractor and supplier, **AND** the Contractors' Certification of Payment Form (CCP), unless an exception is approved pursuant to General contract condition 907.

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

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE

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

(PROJECT NO. and NAME)

Date: _____, 20__.

(NAME OF CONTRACTOR)

Subcontract #: _____.

(NAME OF SUBCONTRACTOR/SUPPLIER)

Subcontract Value: \$ _____.

Last Progress Payment: \$ _____.

Date: _____.

Check Applicable Box:

Total Paid to Date: \$ _____.

[] MBE [] WBE

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
OFFICE OF ECONOMIC
DEVELOPMENT

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. 807
Denver, CO 80202
Phone: 720-913-1999
DSBO@denvergov.org

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Rev: 031816

SC-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)
3. Final/Partial Lien Release.

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

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

SC-13 CONSTRUCTION INSPECTION BY THE CITY

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

1701.1 Persons who are employees of the City or who are under contract to the City or the City as lessee will be assigned to inspect and test the Work. These persons may perform any tests and observe the Work to determine whether or not designs, materials used, manufacturing and construction processes and methods applied, and equipment installed satisfy the requirements of the drawings and specifications, accepted Shop Drawings, Product Data and Samples, and the General Contractor's warranties and guarantees. The General Contractor shall permit these inspectors unlimited access to the Work and provide means of safe access to the Work, which cost shall be included as a Cost of the Work without any increase to the Guaranteed Maximum Price. In addition, General Contractor shall provide whatever access and means of access are needed to off-site facilities used to store or manufacture materials and equipment to be incorporated into the Work and shall respond to any other reasonable request to further the inspector's ability to observe or complete any tests. Such inspections shall not relieve the General Contractor of any of its quality control responsibilities or any other obligations under the Contract. All inspections and all tests conducted by the City are for the convenience and benefit of the City. These inspections and tests do not constitute acceptance of the materials or Work tested or inspected, and the City may reject or accept any Work or materials at any time prior to the inspections pursuant to G.C. 2002, whether or not previous inspections or tests were conducted by the inspector or a City representative.

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

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

SC-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 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-18 INSURANCE

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

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

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

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

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

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

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

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

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

(9) **Additional Provisions:**

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

SC-19 GREENPRINT DENVER REQUIREMENTS

In accordance with the City and County of Denver Executive Order 123: Greenprint Denver Office and Sustainability Policy, as amended, Contractor shall adhere to sections of Executive Order 123 pertinent to the construction of the built environment. This includes but is not limited to: all construction and renovation of buildings shall follow instructions and memorandum for high performance buildings; horizontal projects shall include the use of fly ash concrete and recycled aggregate where possible; and, all projects shall recycle construction and demolition waste, and install materials that contain recycled content whenever possible using the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) as guidance. Non-hazardous solid waste that is eligible for reuse or recycling is not subject to the DADS disposal requirement defined in SC-13.

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

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

SC-20 ACCOUNTING OF COST AND AUDIT

Title 911 is hereby deleted in its entirety and replaced with the following:

Any authorized agent of the City, including the City Auditor or his or her representative, has the right to access, and the right to examine, copy and retain copies, at City's election in paper or electronic form, any pertinent books, documents, papers and records related to Contractors' performance pursuant to this Agreement, provision of any goods or services to the City, and any other transactions related to this Agreement. Contractor shall cooperate with City representatives and City representatives shall be granted access to the foregoing documents and information during reasonable business hours and until the latter of three (3) years after the final payment under the Agreement or expiration of the applicable statute of limitations. When conducting an audit of this Agreement, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the course of an audit. No examination of records and audits pursuant to this paragraph shall require Contractor to make disclosures in violation of state or federal privacy laws. Contractor shall at all times comply with D.R.M.C. 20-276.

SC-21 DEFENSE AND INDEMNIFICATION

Title 1602 is hereby deleted in its entirety and replaced with the following:

- (a) To the fullest extent permitted by law, the Contractor hereby agrees to defend, indemnify, reimburse and hold harmless City, its appointed and elected officials, agents and employees for, from and 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 Agreement 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 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 Agreement 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 Agreement.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

**CITY AND COUNTY OF DENVER
DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE**

PERFORMANCE AND PAYMENT BOND

Bond No. 014216234

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned Sturgeon Electric Company, Inc., 12150 East 112th Avenue, Henderson, CO 80640, a corporation organized and existing under and by virtue of the laws of the State of Colorado, hereafter referred to as the "Contractor", and Liberty Mutual Insurance Company, a corporation organized and existing under and by virtue of the laws of the State of Massachusetts, 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 Five Hundred Twenty-Eight Thousand Six Hundred Seventy-Six Dollars and Fifty Cents (\$528,676.50), 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. 201952606 Yale Station Pedestrian Safety, 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 29th day of January, 2020

Attest:
Meghan Gullley
Secretary

Sturgeon Electric Company, Inc.

Contractor
By: Krysta Brewer
President Krysta Brewer, Asst.
Liberty Mutual Insurance Company Secretary

Surety
By: Sheree Hsieh
Attorney-In-Fact
Sheree Hsieh

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

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

By: [Signature]
Assistant City Attorney

APPROVED FOR THE CITY AND COUNTY OF
DENVER

By: [Signature]
MAYOR

By: [Signature]
EXECUTIVE DIRECTOR OF THE DEPARTMENT
OF TRANSPORTATION AND INFRASTRUCTURE

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Not valid for mortgage, note, loan, letter of credit, bank deposit, currency rate, interest rate or residual value guarantees. To confirm the validity of this Power of Attorney call 610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Michael M. Bill, Michael H. Bill, Edward L. Mounighan, Cynthia L. Jenkins, Ginger J. Krahn, Brenda Johnston, Cindy Stelthorn, Sheree Hsieh, Rebecca A. Virt, Kimberly E. Kinkead, Michael J. Marsella of the city of Indianapolis, state of Indiana its true and lawful attorney-in-fact, with full power and authority hereby conferred to sign, execute and acknowledge the following surety bond:

Principal Name: Sturgeon Electric Company, Inc.
Obligee Name: City and County of Denver
Surety Bond Number: 014216234 Bond Amount: \$528,676.50

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 7th day of December, 2017.



The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 7th day of December, 2017, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing Instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 29th day of January, 2020.



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary



O 317 805 7500 **F** 317 805 7515
A 571 MONON BLVD., SUITE 400, CARMEL, IN 46032
W MJINSURANCE.COM

February 7, 2020

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

RE: Sturgeon Electric Company, Inc.
Contract No: 201952606
Project Name: Yale Station Pedestrian Safety
Contract Amount: \$528,676.50
Performance and Payment Bond No.: 014216234

Dear Assistant City Attorney,

The Performance and Payment Bonds covering the above captioned project were executed by this agency, through Liberty Mutual Insurance Company.

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 (317) 805-7500.

Thanks you.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Sheree Hsieh', written in a cursive style.

Sheree Hsieh
Attorney-in-Fact to Liberty Mutual Insurance Company

Cc: Mr. Mike Ulrich, Liberty Mutual Insurance Company



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Not valid for mortgage, note, loan, letter of credit, bank deposit, currency rate, interest rate or residual value guarantees. To confirm the validity of this Power of Attorney call 610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Michael M. Bill, Michael H. Bill, Edward L. Mounighan, Cynthia L. Jenkins, Ginger J. Krahn, Brenda Johnston, Cindy Stelthom, Sheree Hsieh, Rebecca A. Virt, Kimberly E. Kinkoad, Michael J. Marsella of the city of Indianapolis, state of Indiana its true and lawful attorney-in-fact, with full power and authority hereby conferred to sign, execute and acknowledge the following surety bond:

Principal Name: Sturgeon Electric Company, Inc.
Obligee Name: City and County of Denver
Surety Bond Number: 014216234 Bond Amount: \$528,676.50

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 7th day of December, 2017.



The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 7th day of December, 2017, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 7th day of February, 2020



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
3/18/2020

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 have ADDITIONAL INSURED provisions or 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 Arthur J. Gallagher Risk Management Services, Inc. 2850 Golf Road Rolling Meadows IL 60008	CONTACT NAME: Shannon Lentz PHONE (A/C No. Ext): 630-285-4418 FAX (A/C, No): 630-285-3922 E-MAIL ADDRESS: shannon_lentz@ajg.com														
INSURED MYRGROU-01 Sturgeon Electric Company, Inc. 12150 E. 112th Avenue Henderson, CO 80640	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: center;">INSURER(S) AFFORDING COVERAGE</th> <th style="text-align: center;">NAIC #</th> </tr> <tr> <td>INSURER A : Zurich American Insurance Company</td> <td style="text-align: center;">16535</td> </tr> <tr> <td>INSURER B : American Zurich Insurance Company</td> <td style="text-align: center;">40142</td> </tr> <tr> <td>INSURER C :</td> <td></td> </tr> <tr> <td>INSURER D :</td> <td></td> </tr> <tr> <td>INSURER E :</td> <td></td> </tr> <tr> <td>INSURER F :</td> <td></td> </tr> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A : Zurich American Insurance Company	16535	INSURER B : American Zurich Insurance Company	40142	INSURER C :		INSURER D :		INSURER E :		INSURER F :	
INSURER(S) AFFORDING COVERAGE	NAIC #														
INSURER A : Zurich American Insurance Company	16535														
INSURER B : American Zurich Insurance Company	40142														
INSURER C :															
INSURER D :															
INSURER E :															
INSURER F :															

COVERAGES **CERTIFICATE NUMBER: 2028196742** **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 INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:	Y	Y	GLO837415425	9/30/2019	9/30/2020	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	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY <input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$	Y	Y	BAP837415523	9/30/2019	9/30/2020	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
B A	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 N	Y N/A	WC837415223 (A/O/S) WC837415323 (MA/WI)	9/30/2019 9/30/2019	9/30/2020 9/30/2020	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER 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 (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 Description of Job: Yale Station Pedestrian Safety; SECO Job #841708

As required by written contract, the City and County of Denver, its elected and appointed officials, employees and volunteers are included as additional insured for the general liability and automobile liability coverages.

CERTIFICATE HOLDER 1556 City & County of Denver Department of Transportation 201 W Colfax Ave Dept 614 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
---	--



NOTICE TO APPARENT LOW BIDDER

Name
Address
City, State, ZIP

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

Contract No. 201952606, Yale Station Pedestrian Safety

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: **(Seventy-One [71]) bid items (201-00000 through 700-70589)** the total estimated cost thereof being: (\$ _____).

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

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

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

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

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

NOTICE TO APPARENT LOW BIDDER
CONTRACT NO. 201952606
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 _____ 2019.

CITY AND COUNTY OF DENVER

S A M P L E

By _____
Executive Director of Public Works

City and County of Denver Department of Public Works
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw

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



**NOTICE TO PROCEED
(SAMPLE)**

Current Date

Name

Company

Street

City/State/Zip

Contract No. 201952606, Yale Station Pedestrian Safety

In accordance with General Contract Condition 302 of the Standard Specifications for Construction, General Contract Conditions, 2011 Edition, you are hereby authorized and directed to proceed on _____ with the work of constructing contract number 201952606, as set forth in detail in the contract documents for the City and County of Denver.

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

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

Sincerely,

Lesley B. Thomas
City Engineer

cc:

City and County of Denver Department of Public Works
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw

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

Contract No. 201952606
Yale Station Ped Safety

BDP - 53

November 19, 2019



Certificate of Contract Release
(SAMPLE)

Current Date

Name
Street Address
City, State, Zip

RE: Certificate of Contract Release for
201952606, Yale Station Pedestrian Safety

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

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

Contractor's Signature

Date Signed

If there are any questions, please contact me by telephone at (###) ###-####. Please return this document to me via email at pw.procurement@denvergov.org.

Sincerely,

Contract Administration

City and County of Denver Department of Public Works
201 West Colfax Avenue, Dept 608 | Denver, CO 80202
www.denvergov.org/dpw

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

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Prevailing Wage Rates

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019



TO: All Users of the City and County of Denver Prevailing Wage Schedules
FROM: Ryland Feno, Classification & Compensation Technician II
DATE: August 21, 2019
SUBJECT: Latest Change to Prevailing Wage Schedules

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

The effective date for this publication will be **Friday, May 10, 2019** and applies to the City and County of Denver for **HIGHWAY CONSTRUCTION PROJECTS** in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO190009
Superseded General Decision No. CO20180019
Modification No. 1
Publication Date: 05/10/2019
(6 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.

Attachments as listed above.

***Career Service Board approved to adjust all Davis Bacon classifications under \$13.00 to comply with the city's minimum wage. The effective date is August 15, 2019. See page 7 for reference.**

Office of Human Resources
201 W. Colfax Ave. Dept. 412 | Denver, CO 80202
p: 720.913.5751 | f: 720.913.5720
www.denvergov.org/humanresources

General Decision Number: CO190009 05/10/2019 CO9

Superseded General Decision Number: CO20180019

State: Colorado

Construction Type: Highway

Counties: Denver and Douglas Counties in Colorado.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019
1	05/10/2019

CARP9901-008 05/01/2018

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 25.50	9.47

ELEC0068-016 03/01/2011

	Rates	Fringes
TRAFFIC SIGNALIZATION:		
Traffic Signal Installation		
Zone 1.....	\$ 26.42	4.75%+8.68
Zone 2.....	\$ 29.42	4.75%+8.68

TRAFFIC SIGNAL INSTALLER ZONE DEFINITIONS

Zone 1 shall be a 35 mile radius, measured from the following addresses in each of the following cities:
 Colorado Springs - Nevada & Bijou
 Denver - Ellsworth Avenue & Broadway
 Ft. Collins - Prospect & College
 Grand Junction - 12th & North Avenue
 Pueblo - I-25 & Highway 50
 All work outside of these areas shall be paid Zone 2 rates.

 * ENGI0009-008 05/01/2018

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
(3)-Hydraulic Backhoe (Wheel Mounted, under 3/4 yds), Hydraulic Backhoe (Backhoe/Loader combination), Drill Rig Caisson (smaller than Watson 2500 and similar), Loader (up to and including 6 cu. yd.).....	\$ 28.25	10.70
(3)-Loader (under 6 cu. yd.) Denver County.....	\$ 28.25	10.70
(3)-Motor Grader (blade- rough) Douglas County.....	\$ 28.25	10.70
(4)-Crane (50 tons and under), Scraper (single bowl, under 40 cu. yd).....	\$ 28.40	10.70
(4)-Loader (over 6 cu. yd) Denver County.....	\$ 28.40	10.70
(5)-Drill Rig Caisson (Watson 2500 similar or larger), Crane (51-90 tons), Scraper (40 cu.yd and over),.....	\$ 28.57	10.70
(5)-Motor Grader (blade- finish) Douglas County.....	\$ 28.57	10.70
(6)-Crane (91-140 tons).....	\$ 29.55	10.70

 SUCO2011-004 09/15/2011

	Rates	Fringes
CARPENTER (Excludes Form Work)...	\$ 19.27	5.08
CEMENT MASON/CONCRETE FINISHER		
Denver.....	\$ 20.18	5.75
Douglas.....	\$ 18.75	3.00

ELECTRICIAN (Excludes Traffic Signal Installation).....	\$ 35.13	6.83
FENCE ERECTOR (Excludes Link/Cyclone Fence Erection).....	\$ 13.02	3.20
GUARDRAIL INSTALLER.....	\$ 12.89	3.20
HIGHWAY/PARKING LOT STRIPING:Painter		
Denver.....	\$ 12.62	3.21
Douglas.....	\$ 13.89	3.21
IRONWORKER, REINFORCING (Excludes Guardrail Installation).....	\$ 16.69	5.45
IRONWORKER, STRUCTURAL (Includes Link/Cyclone Fence Erection, Excludes Guardrail Installation).....	\$ 18.22	6.01
LABORER		
Asphalt Raker.....	\$ 16.29	4.25
Asphalt Shoveler.....	\$ 21.21	4.25
Asphalt Spreader.....	\$ 18.58	4.65
Common or General		
Denver.....	\$ 16.76	6.77
Douglas.....	\$ 16.29	4.25
Concrete Saw (Hand Held)....	\$ 16.29	6.14
Landscape and Irrigation....	\$ 12.26	3.16
Mason Tender- Cement/Concrete		
Denver.....	\$ 16.96	4.04
Douglas.....	\$ 16.29	4.25
Pipelayer		
Denver.....	\$ 13.55	2.41
Douglas.....	\$ 16.30	2.18
Traffic Control (Flagger)....	\$ 9.55	3.05
Traffic Control (Sets Up/Moves Barrels, Cones, Install Signs, Arrow Boards and Place Stationary Flags)(Excludes Flaggers).....	\$ 12.43	3.22
PAINTER (Spray Only).....	\$ 16.99	2.87
POWER EQUIPMENT OPERATOR:		
Asphalt Laydown		
Denver.....	\$ 22.67	8.72
Douglas.....	\$ 23.67	8.47
Asphalt Paver		
Denver.....	\$ 24.97	6.13
Douglas.....	\$ 25.44	3.50
Asphalt Roller		
Denver.....	\$ 23.13	7.55

Douglas.....	\$ 23.63	6.43
Asphalt Spreader.....	\$ 22.67	8.72
Backhoe/Trackhoe		
Douglas.....	\$ 23.82	6.00
Bobcat/Skid Loader.....	\$ 15.37	4.28
Boom.....	\$ 22.67	8.72
Broom/Sweeper		
Denver.....	\$ 22.47	8.72
Douglas.....	\$ 22.96	8.22
Bulldozer.....	\$ 26.90	5.59
Concrete Pump.....	\$ 21.60	5.21
Drill		
Denver.....	\$ 20.48	4.71
Douglas.....	\$ 20.71	2.66
Forklift.....	\$ 15.91	4.68
Grader/Blade		
Denver.....	\$ 22.67	8.72
Guardrail/Post Driver.....	\$ 16.07	4.41
Loader (Front End)		
Douglas.....	\$ 21.67	8.22
Mechanic		
Denver.....	\$ 22.89	8.72
Douglas.....	\$ 23.88	8.22
Oiler		
Denver.....	\$ 23.73	8.41
Douglas.....	\$ 24.90	7.67
Roller/Compactor (Dirt and Grade Compaction)		
Denver.....	\$ 20.30	5.51
Douglas.....	\$ 22.78	4.86
Rotomill.....	\$ 16.22	4.41
Screed		
Denver.....	\$ 22.67	8.38
Douglas.....	\$ 29.99	1.40
Tractor.....	\$ 13.13	2.95
TRAFFIC SIGNALIZATION:		
Groundsman		
Denver.....	\$ 17.90	3.41
Douglas.....	\$ 18.67	7.17
TRUCK DRIVER		
Distributor		
Denver.....	\$ 17.81	5.82
Douglas.....	\$ 16.98	5.27
Dump Truck		
Denver.....	\$ 15.27	5.27
Douglas.....	\$ 16.39	5.27
Lowboy Truck.....	\$ 17.25	5.27
Mechanic.....	\$ 26.48	3.50
Multi-Purpose Specialty & Hoisting Truck		
Denver.....	\$ 17.49	3.17
Douglas.....	\$ 20.05	2.88
Pickup and Pilot Car		
Denver.....	\$ 14.24	3.77
Douglas.....	\$ 16.43	3.68

Semi/Trailer Truck.....	\$ 18.39	4.13
Truck Mounted Attenuator....	\$ 12.43	3.22
Water Truck		
Denver.....	\$ 26.27	5.27
Douglas.....	\$ 19.46	2.58

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

**Office of Human Resources
Supplemental Rtes
(Specific to the Denver Projects)
Revised 08/21/2019)**

Classification		Base	Fringe
Guard Rail Installer		\$13.00	\$3.20
Highway Parking Lot Striping: Painter		\$13.00	\$3.21
Ironworker (Ornamental)		\$26.05	\$12.00
Laborer	Removal of Asbestos	\$21.03	\$8.55
Laborer (Landscape & Irrigation)		\$13.00	\$3.16
Laborer: Traffic Control (Flagger)		\$13.00	\$3.05
Laborer: Stationary Flags(excludes Flaggers)		\$13.00	\$3.22
Line Construction	Lineman, Gas Fitter/Welder	\$36.88	\$9.55
	Line Eq Operator/Line Truck Crew	\$25.74	\$8.09
Millwright		\$28.00	\$10.00
Pipefitter		\$30.45	\$12.85
Plumber		\$30.19	\$13.55
Power Equipment Operator (Tunnels Above and Below Ground, shafts and raises):	Group 1	\$25.12	\$10.81
	Group 2	\$25.47	\$10.85
	Group 3	\$25.57	\$10.86
	Group 4	\$25.82	\$10.88
	Group 5	\$25.97	\$10.90
	Group 6	\$26.12	\$10.91
	Group 7	\$26.37	\$10.94
Power Equipment Operator	Group 1	\$22.97	\$10.60
	Group 2	\$23.32	\$10.63
	Group 3	\$23.67	\$10.67
	Group 4	\$23.82	\$10.68
	Group 5	\$23.97	\$10.70
	Group 6	\$24.12	\$10.71
	Group 7	\$24.88	\$10.79
Truck Driver	Group 1	\$18.42	\$10.00
	Group 2	\$19.14	\$10.07
	Group 3	\$19.48	\$10.11
	Group 4	\$20.01	\$10.16
	Group 5	\$20.66	\$10.23
	Group 6	\$21.46	\$10.31
Truck Driver: Truck Mounted Attenuator		\$13.00	\$3.22

Go to <http://www.denvergov.org/Auditor> to view the Prevailing Wage Clarification Document for a list of complete classifications used.

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Addenda

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019

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

**CONTRACT NO: 201952606
PROJECT NAME: YALE STATION PEDESTRIAN SAFETY**

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:

POSTPONEMENT OF PRE-BID CONFERENCE:

City and County of Denver
Department of Public Works
Pre-Bid Postponement Notice

Contract No. 201952606
Yale Station Pedestrian Safety

Due to impending inclement weather, notice is hereby given that the Pre-Bid Conference for Contract No. 201952606 – Yale Station Pedestrian Safety, is hereby postponed. The Pre-Bid Conference will be held at the WEBB Building, 201 W. Colfax Ave., 4th Floor Conference Room 4.I.4, Denver, Colorado 80202, on:


**December 2, 2019
1:00 p.m., local time**

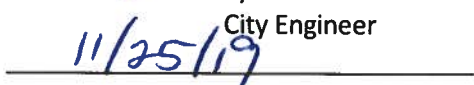
Published in the Daily Journal on November 26, 27, and December 2, 2019.

Deadline to Submit Questions Extension

Notice is hereby given that the deadline to submit questions for Contract No. 201952606 – Yale Station Pedestrian Safety is hereby extended to 10:00 a.m., local time on December 9, 2019.

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



Lesley B. Thomas
City Engineer


Date

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

Contractor

Date

ADDENDUM NO. 1

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

**CONTRACT NO: 201952606
PROJECT NAME: YALE STATION PEDESTRIAN SAFETY**

ADDENDUM NO. 2 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:

I. QUESTIONS AND ANSWERS:

Q1. Will the Traffic Signal Poles have to be provided with the Valmont Mitigator?

A1. The Valmont mitigator is currently in the specifications and will need to be provided.

Q1.1. If they do not, will the Valmont pole still be required?

A1.1 A Valmont pole is not necessarily required in conjunction with the mitigator. Per the Questions and Answers at <http://az276019.vo.msecnd.net/valmontstaging/docs/librariesprovider97/mitigator-questions-and-answers/tmp8292-mitigator-questions-and-answers-0716.pdf?sfvrsn=2>, Valmont states that “We recognize that DOTs and other entities may choose to attach the Valmont Mitigator product to poles and mast arms supplied by others. Generally speaking, this innovation may be bolted onto most any mast arm, regardless of who manufactured the pole.” The contractor should verify that any proposed pole/mast arm is compatible with the mitigator and that the mitigator can be purchased as a standalone item if opting to utilize with a different pole/mast arm.

Q2. Will the QA and Testing cost be paid for by the City?

A2. Yes, the QA contract and QA testing will be performed for and paid by the City. The contractor should have a QC plan and anticipate testing. If any test results from QA show below target values in compaction, gradation, etc., it will benefit the contractor to provide alternate documentation and/or have samples collected in order to test. The contractor will need to work with the city’s QA and provide documentation/submittals and allow access to testing as requested.

Q3. Please provide a description of the Pay Item 201-00000 - Clearing & Grubbing.

A3. Clearing and Grubbing is limited to what is shown on Sheet 15 and described as the Removal of Existing Landscaping. Specifications follow CDOT standards for section 201 Clearing and Grubbing.

Q4. Please provide some clarity for the 2" Irrigation Sleeve on the Table on Sheet #12?

A4. This is to account for any irrigation pipe replacement that may be needed in the landscaped areas in and near the construction bounds. This will be paid for in the landscape maintenance lump sum item and is shown for information only.

Q4.1. If this work is intended, what page is the work shown on? Also clarify Landscaping note.

A4.1. The landscaping area that is impacted is shown on sheet #15, and the irrigation pipe replacement item is a conservative precaution item to account for repairing any irrigation lines that are impacted by the project if present in the impacted area. The landscaping note is intended to direct the contractor to coordinate with the CCD project manager on the appropriate landscaping material to restore the impacted area.

Q5. The Tabulation of Sign table on sheet #13 is incomplete.

A5. Table on sheet #13 show permanent signs installed on project with the exception of the signs on the mast arms at signals on sheet #22. Bid tab has both of these quantities and is correct.

Q6. Can note #12 on Sheet #6 be removed or revised?

A6. Note #12 on sheet #6 is incorrect and should say conductors instead of conduit. Reference Traffic Signal, Sign, and Pavement Marking Standards (March 2019) Standard Drawing No 16.1.1 for traffic signal notes that will apply to this project. Notes in plans on Sheet 5 and 6 with the header Traffic Signal – General, Traffic Signal – Hardware, Traffic Signal – Construction, Traffic Signal – Signing are hereby replaced with Traffic Signal Notes from the 2019 Traffic Signal Standards in 16.1.1 and included with this addendum. More details for these conductors are shown in 16.1.16.

Q7. Where will the Existing City Fiber be disconnected? Will it be at an existing splice closure?

A7. It is not expected that the existing city FO line will need to be entirely disconnected. There is adequate “slack” FO line in the existing pullbox to allow the contractor to relocate the existing FO line to avoid the proposed traffic signal caisson (NW corner) and place remaining slack FO line into the relocated traffic signal pullbox (NE corner). Conduit may need to be repositioned to accommodate. A connection will still need to tap into the relocated traffic pull box to the signal cabinet location. No, there is no existing splice closure.

Q7.1. If yes, will the Contractor need to Heal the Backbone? Size of Existing Cable?

A7.1. Size of the Fiber is 72F-48SM/24MM but the contractor will not need to heal the entire backbone.

Q8. Can Pay Item 630-XXXXX - Traffic Control - Lump Sum be Revised? Per device is the preferred method as in previous projects.

A8. Traffic Control Lump Sum will not be revised on this project but the preference to advertise future solicitations with per item traffic control items is noted.

Q9. The Specification sheets #18 and #19 for the Caissons are inconsistent - Please revise or add a pay item for Vacuumed Caissons.

A9. Drilled caissons have been replaced with vacuumed caissons on the bid sheets. The specification will still say both drilled and vacuumed caissons since these are the new specifications however on this project, the vacuuming method is specified and should be what is bid on.

II. REVISION AND/OR ADDED DOCUMENTS:

- i. BID FORM:** Replace existing pages BF-6.1 through BF-6.6 with BF – 6.1 Addendum #2 through BF – 6.6 Addendum #2.
- ii. BID DOCUMENTS PACKAGE:** Replace existing pages SQ-1 through SQ-4 with SQ – 1 Addendum #2 through SQ – 4 Addendum #2.
- iii. ADDED DOCUMENTS:**
 - i. TRAFFIC SIGNAL NOTES REFERENCED IN A6**
 - ii. REVISED SPECIFICATION SHEETS REFERENCED IN Q9:** Revision of Section 503 – DRILLED AND VACUUMED CAISSON, 2 pages.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

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



Lesley B. Thomas
City Engineer

12-10-19

Date

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

Contractor

Date

ADDENDUM NO. 2

Item No.	Description and Price	Estimated Quantity	Estimated Cost
201-00000	Clearing and Grubbing at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
202-00195	Removal of Median Cover at the unit price of \$_____per SQUARE YARD	2 SY	\$ _____
202-00200	Removal of Sidewalk at the unit price of \$_____per SQUARE YARD	17 SY	\$ _____
202-00203	Removal of Curb and Gutter at the unit price of \$_____per LINEAR FOOT	39 LF	\$ _____
202-00206	Removal of Concrete Curb Ramp at the unit price of \$_____per SQUARE YARD	5 SY	\$ _____
202-00220	Removal of Asphalt Mat at the unit price of \$_____per SQUARE YARD	56 SY	\$ _____
202-00240	Removal of Asphalt Mat (Planing) at the unit price of \$_____per SQUARE YARD	276 SY	\$ _____
202-00250	Removal of Pavement Marking at the unit price of \$_____per SQUARE FOOT	1,041 SF	\$ _____
203-00100	Muck Excavation at the unit price of \$_____per CUBIC YARD	10 CY	\$ _____
202-00810	Removal of Ground Sign at the unit price of \$_____per EACH	1 EA	\$ _____
203-01597	Potholing at the unit price of \$_____per HOUR	75 HR	\$ _____
203-02330	Laborer at the unit price of \$_____per HOUR	40 HR	\$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
208-00035	Aggregate Bag at the unit price of \$_____per LINEAR FOOT	30 LF	\$ _____
208-00045	Concrete Washout Structure at the unit price of \$_____per EACH	1 EA	\$ _____
208-00051	Storm Drain Inlet Protection (Type 1) at the unit price of \$_____per LINEAR FOOT	3 LF	\$ _____
208-00205	Erosion Control Supervisor at the unit price of \$_____per HOUR	40 HR	\$ _____
210-00861	Reset Wiring - Fiber Optic at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
210-04010	Adjust Manhole at the unit price of \$_____per EACH	1 EA	\$ _____
214-00000	Landscape Maintenance at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
214-00145	Plant Protect Fence at the unit price of \$_____per LINEAR FOOT	60 LF	\$ _____
304-06007	Aggregate Base Course (Class 6) at the unit price of \$_____per CUBIC YARD	10 CY	\$ _____
403-00721	Hot Mix Asphalt (Patching) (Asphalt) at the unit price of \$_____per SQUARE YARD	56 SY	\$ _____
403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22) at the unit price of \$_____per TON	40 TON	\$ _____
412-00190	Concrete Pavement (Patching) at the unit price of \$_____per SQUARE YARD	6 SY	\$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
412-00600	Concrete Pavement (6 Inch) at the unit price of \$_____per SQUARE YARD	3 SY	\$ _____
503-00024	Drilled and Vacuumed Caisson (24 Inch) at the unit price of \$_____per LINEAR FOOT	7 LF	\$ _____
503-00036	Drilled and Vacuumed Caisson (36 Inch) at the unit price of \$_____per LINEAR FOOT	39 LF	\$ _____
607-11580	Construction Limit Fencing at the unit price of \$_____per LINEAR FOOT	25 LF	\$ _____
608-00010	Concrete Curb Ramp at the unit price of \$_____per SQUARE YARD	32 SY	\$ _____
608-00015	Detectable Warnings at the unit price of \$_____per SQUARE FOOT	44 SF	\$ _____
609-21010	Curb and Gutter Type 2 (Section I-B) (6" Curb and Gutter - 1' Spill Pan) at the unit price of \$_____per LINEAR FOOT	188 LF	\$ _____
609-21020	Curb and Gutter Type 2 (Section II-B) (6" Curb and Gutter - 2' Catch/Spill Pan) at the unit price of \$_____per LINEAR FOOT	31 LF	\$ _____
610-00030	Median Cover Material (Concrete - 6 Inch) at the unit price of \$_____per SQUARE FOOT	480 SF	\$ _____
613-XXXXX	Electric Meter Pedestal Cabinet and Base at the unit price of \$_____per EACH	1 EA	\$ _____
613-00206	2 Inch Electrical Conduit (Bored) at the unit price of \$_____per LINEAR FOOT	195 LF	\$ _____
613-00306	3 Inch Electrical Conduit (Bored) at the unit price of \$_____per LINEAR FOOT	365 LF	\$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
613-01200	2 Inch Electrical Conduit (Plastic) at the unit price of \$_____per LINEAR FOOT	115 LF	\$ _____
613-01300	3 Inch Electrical Conduit (Plastic) at the unit price of \$_____per LINEAR FOOT	185 LF	\$ _____
613-07000	Pull Box (Special) at the unit price of \$_____per EACH	3 EA	\$ _____
613-07002	Type Two Pull Box at the unit price of \$_____per EACH	4 EA	\$ _____
613-07003	Type Three Pull Box at the unit price of \$_____per EACH	5 EA	\$ _____
613-10000	Wiring at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
613-13000	Luminaire (LED) at the unit price of \$_____per EACH	4 EA	\$ _____
614-00011	Sign Panel (Class I) at the unit price of \$_____per SQUARE FOOT	38 SF	\$ _____
614-00012	Sign Panel (Class II) at the unit price of \$_____per SQUARE FOOT	28 SF	\$ _____
614-00216	Steel Sign Post (2x2 Inch Tubing) at the unit price of \$_____per LINEAR FOOT	23 LF	\$ _____
614-70150	Pedestrian Signal Face (16 (Countdown)) at the unit price of \$_____per EACH	4 EA	\$ _____
614-70336	Traffic Signal Face (12-12-12) at the unit price of \$_____per EACH	8 EA	\$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
614-70448	Traffic Signal Face (12-12-12-12) at the unit price of \$_____per EACH	2 EA	\$ _____
614-72855	Traffic Signal Controller and Cabinet at the unit price of \$_____per EACH	1 EA	\$ _____
614-72860	Pedestrian Push Button at the unit price of \$_____per EACH	3 EA	\$ _____
614-72863	Pedestrian Push Button Post Assembly at the unit price of \$_____per EACH	2 EA	\$ _____
614-72866	Fire Preemption Unit and Timer at the unit price of \$_____per EACH	3 EA	\$ _____
614-72895	Intersection Detection System (FLIR Camera) at the unit price of \$_____per EACH	2 EA	\$ _____
614-81000	Traffic Signal-Light Pole Steel at the unit price of \$_____per EACH	1 EA	\$ _____
614-81120	Traffic Signal-Light Pole Steel (1-20 Foot Mast Arm) at the unit price of \$_____per EACH	2 EA	\$ _____
614-81140	Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm) at the unit price of \$_____per EACH	1 EA	\$ _____
614-86105	Telemetry (Field) at the unit price of \$_____per EACH	1 EA	\$ _____
614-86800	Uninterrupted Power Supply at the unit price of \$_____per EACH	1 EA	\$ _____
614-87333	Closed Circuit Television Camera (Traffic Monitoring) at the unit price of \$_____per EACH	1 EA	\$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
614-87690	Ethernet Managed Switch at the unit price of \$_____per EACH	1 EA	\$ _____
623-00000	Mobilization at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
625-00000	Construction Surveying at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
627-00005	Epoxy Pavement Marking at the unit price of \$_____per GALLON	6 GAL	\$ _____
627-30405	Preformed Thermoplastic Pavement Marking (Word-Symbol) at the unit price of \$_____per SQUARE FOOT	47 SF	\$ _____
627-30410	Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line) at the unit price of \$_____per SQUARE FOOT	339 SF	\$ _____
629-01001	Survey Monument (Type 1) at the unit price of \$_____per EACH	3 EA	\$ _____
630-XXXXX	Construction Traffic Control at the unit price of \$_____per LUMP SUM	1 LS	\$ _____
630-00003	Uniformed Traffic Control at the unit price of \$_____per HOUR	16 HR	\$ _____
700-70082	Force Account - Furnish & Install Electrical Service at the unit price of <u>\$19,780.00</u> per FORCE ACCOUNT	1 FA	\$ <u>19,780.00</u>
700-70589	Force Account - Environmental Health & Safety Management at the unit price of <u>\$5,000.00</u> per FORCE ACCOUNT	1 FA	\$ <u>5,000.00</u>

TRAFFIC SIGNAL NOTES

GENERAL

1. ITEM NUMBER REFERS TO THE APPROPRIATE SECTION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION – COLORADO DEPARTMENT OF TRANSPORTATION 2017.
2. FOR WORK INVOLVING XCEL ENERGY, THE CONTRACTOR SHALL COMPLY WITH THE FRANCHISE AGREEMENT IN PLACE BETWEEN THE CITY & COUNTY OF DENVER AND XCEL ENERGY. XCEL ENERGY SHALL PROVIDE POWER SOURCE WITHIN 10' OF TRAFFIC SIGNAL CABINET. THEREFORE ALL SUBMITTALS FOR TRAFFIC SIGNAL POLES SHALL BE MADE TO THE CITY & COUNTY OF DENVER PUBLIC WORKS TRANSPORTATION OPERATIONS OR AS DESIGNATED BY THE ENGINEER. NO TRAFFIC SIGNAL POLES OR STREET LIGHT POLES SHALL BE ORDERED UNTIL A SUBMITTAL HAS BEEN ACCEPTED FROM CITY & COUNTY OF DENVER PUBLIC WORKS TRANSPORTATION OPERATIONS. ALL TRAFFIC SIGNAL AND STREET LIGHTS SHALL BE WIRED INTO THE ELECTRIC METER.
3. XCEL ENERGY TO REMOVE ONLY XCEL OWNED POLES AND EXISTING STREET LIGHTING. THE CONTRACTOR SHALL REMOVE ALL OTHER SIGNAL EQUIPMENT INCLUDING ALL CITY OWNED SIGNAL POLES WITH OR WITHOUT STREET LIGHTING, MAST ARMS, SPAN WIRE POLES, PEDESTAL POLES, SIGNAL HEADS, SPAN WIRE, PUSH BUTTONS, PULL BOXES, CONTROLLER CABINETS AND ALL FOUNDATIONS AS SHOWN ON THE PLANS. CONTRACTOR SHALL REPAIR ALL SIDEWALK AND OTHER CONCRETE AFTER REMOVALS OR AS DIRECTED AND APPROVED BY DENVER PUBLIC WORKS TRANSPORTATION OPERATIONS.
4. ALL SALVAGED SIGNAL EQUIPMENT REMOVED REMAINS THE PROPERTY OF THE CITY & COUNTY OF DENVER AND MUST BE DELIVERED TO DENVER PUBLIC WORKS TRANSPORTATION OPERATIONS AT 5440 ROSLYN STREET. COORDINATE WITH PUBLIC WORKS TRANSPORTATION PROJECT INSPECTOR AT (720) 865-4000 PRIOR TO DELIVERY.
5. NO TRAFFIC SIGNAL SHALL BE TURNED ON OR TURNED OFF ON A FRIDAY OR PRIOR TO A HOLIDAY WITHOUT PRIOR AUTHORIZATION FROM DENVER PUBLIC WORKS TRANSPORTATION (720) 865-4000. NO TRAFFIC SIGNAL SHALL BE TURNED ON WITHOUT PERMANENT SIGNING AND STRIPING.

HARDWARE

6. ALL SIGNAL HEADS (NOT RIGIDLY SUPPORTED TOP AND BOTTOM) SHALL BE CONSTRUCTED OF DIE CAST ALUMINUM AND PAINTED DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056 (12" DIAMETER ONLY).
7. POLYCARBONATE SIGNAL HEADS ARE REQUIRED FOR ALL TRAFFIC SIGNALS AND PEDESTRIAN SIGNALS. ALL POLYCARBONATE HEADS SHALL BE DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
8. ALL HARDWARE INCLUDING SPACERS, ELBOWS, AND POLE PLATES SHALL BE PAINTED DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
9. LIGHT EMITTING DIODE (LED) SIGNAL LENSES SHALL BE INSTALLED IN ALL SIGNAL INDICATIONS (RED, YELLOW, GREEN, AND WALK, DON'T WALK, AND COUNTDOWN PEDESTRIAN SIGNAL HEAD INDICATIONS).
10. CONTRACTOR SHALL INSTALL THE SIGNAL POLES AND PEDESTALS AT THE EXACT LOCATION AS SHOWN IN THE PLAN UNLESS AUTHORIZED BY THE ENGINEER. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS WITH THE CITY & COUNTY OF DENVER PUBLIC WORKS ENGINEER PRIOR TO START OF WORK.

HARDWARE (CONT.)

11. PEDESTRIAN PUSH BUTTON SHALL BE IN COMPLIANCE WITH MUTCD SECTION 4E.08. PUSH BUTTONS SHOULD BE LOCATED BETWEEN 1.5 AND 6' FROM THE EDGE OF THE CURB, SHOULDER, OR PAVEMENT.

CONSTRUCTION

12. ALL CONDUIT SHALL BE SCHEDULE 80 PVC OR HDPE. TWO 3 INCH CONDUITS SHALL BE BROUGHT INTO THE POLE BASE FOR ALL MAST ARM POLES. TWO 2 INCH CONDUITS SHALL BE BROUGHT INTO THE POLE BASE FOR ALL SIGNAL POLES WITHOUT MAST ARM.
13. ONE PULL BOX TO BE INSTALLED AT LOCATIONS SHOWN AS (3H). DESIGNATE ON LID "TRAFFIC" FOR SIGNAL CABLES BY PHYSICALLY EMBOSSING, NOT PAINTING. PULL BOX FOR COMMUNICATION CONDUITS SHALL BE THE (3H) (COMM) UNLESS SPECIFIED ON THE PLAN AS (3H) (SPECIAL). COMMUNICATION PULL BOX LIDS SHALL BE DESIGNATED "TRAFFIC COMM" BY PHYSICALLY EMBOSSING, NOT PAINTING. SEE STD. DWG. NO. 16.1.7 FOR PULL BOX DIMENSIONS.
14. A SINGLE 3 INCH CONDUIT SHALL BE REQUIRED AND INSTALLED FROM THE TRAFFIC COMM PULL BOX TO THE TRAFFIC SIGNAL CONTROLLER CABINET. CONDUIT SHALL BE SCHEDULE 80 PVC CONDUIT.
15. INTERCONNECT CONDUIT PULL BOXES SHALL BE PLACED AT 500 FOOT MAXIMUM SPACING, OR OTHERWISE DIRECTED BY CITY & COUNTY OF DENVER PUBLIC WORKS ENGINEER.
16. INSTALL WATER VALVE PULL BOX (3P) AND 2 INCH SCHEDULE 80 PVC CONDUIT FOR LOOP DETECTION INTERCEPT WHERE SHOWN ON PLANS. SEE STD DWG NO 16.1.5.
17. ALL HOLES IN TRAFFIC SIGNAL POLES TO BE DRILLED OR SAWED. INSTALLING HOLES BY BURNING WITH A TORCH IS NOT APPROVED.
18. FOR MAST ARM MOUNTED SIGNAL HEADS, THE BOTTOM OF ALL OVERHEAD MOUNTED SIGNAL HEADS SHALL BE ON THE SAME HORIZONTAL PLANE AND HAVE A MINIMUM CLEARANCE OF 18' AND A MAXIMUM CLEARANCE OF 19'-0" ABOVE THE CROWN OF PAVEMENT SURFACE, UNLESS OTHERWISE SPECIFIED BY CITY & COUNTY OF DENVER PUBLIC WORKS ENGINEER.
19. FOR SPAN WIRED MOUNTED SIGNAL HEADS, THE BOTTOM OF ALL OVERHEAD MOUNTED SIGNAL HEADS SHALL BE ON THE SAME HORIZONTAL PLANE AND HAVE A MINIMUM CLEARANCE OF 16'-6" ABOVE THE CROWN OF PAVEMENT SURFACE, UNLESS OTHERWISE SPECIFIED BY CITY & COUNTY OF DENVER PUBLIC WORKS ENGINEER. ALL SPAN WIRE SHALL INCLUDE A BOTTOM WIRE OR WIND TETHER.
20. EXISTING SIGNAL FACES SHALL REMAIN VISIBLE AND ILLUMINATED UNTIL NEW SIGNALS ARE TURNED ON. BLOCKING OF EXISTING FACE BY NEW FACE WILL REQUIRE NEW FACE TO BE TEMPORARILY WIRED FOR ILLUMINATION.
21. ANCHOR BOLTS SHALL NOT BE TRIMMED UNTIL SIGNAL POLE BASE ELEVATION IS APPROVED BY CITY & COUNTY OF DENVER PUBLIC WORKS ENGINEER.

WIRING

22. ALL TRAFFIC SIGNAL WIRE CONNECTORS SHALL BE OF THE BUCHANNAN COMPRESSION TYPE WITH COPPER NONFERROUS CONNECTORS AND IDEAL WRAP-CAPS OR APPROVED EQUAL.
23. WIRE SPLICING IN THE PULL BOXES ARE NOT ALLOWED EXCEPT FOR THE LOOP WIRES. ALL LOOP WIRES SHALL BE SPLICED IN THE WATER VALVE TRAFFIC PULL BOXES.
24. THREE (3) SPARE CONDUCTORS SHALL BE PROVIDED TO EACH HAND HOLE AND TO THE END OF EACH MAST ARM.
25. ALL SOLDERLESS CONNECTORS SHALL BE USED.

SIGNING

26. OVERHEAD STREET NAME SIGNS TO BE FURNISHED AND INSTALLED ON EACH MAST ARM AS NOTED ON STD DWG NO 16.2.12. SIGN TO BE BOLTED ON 18 INCH TELSAPAR EXTENSION WHICH CONNECTS TO MAST ARM BY USE OF ADAPTER SCREWED INTO HOUSING.
27. CONTRACTOR SHALL NOT REMOVE ANY REGULATORY TRAFFIC SIGNS UNLESS SPECIFIED ON PLANS. CITY & COUNTY OF DENVER PUBLIC WORKS ENGINEER TO BE NOTIFIED 48 HOURS PRIOR TO ANY SIGNING CHANGES AT (720) 865-4000.
28. ALL PERTINENT SIGNS AND PAVEMENT MARKINGS MUST BE IN PLACE AT THE TIME A TRAFFIC SIGNAL CHANGE IS MADE, SUCH AS A NEW SIGNAL TURN ON, AND OR CHANGES MADE TO EXISTING SIGNAL OPERATION.

Computer File Information		Sheet Revisions		 <p>DEPARTMENT OF PUBLIC WORKS 201 WEST COLFAX AVENUE DENVER, CO 80202 PHONE: (720) 913-4501 FAX: (720) 913-4544</p>	<p>TRAFFIC SIGNAL NOTES</p> <p>Issued By:</p>	STANDARD DRAWING NO.
Creation Date:	Initials:	Date:	Comments:			16.1.1
Full Path:						
Drawing File Name:						
CAD Ver.:	Scale:	Units:				Sheet No. 03 of 37

-1-

**REVISION OF SECTION 503
DRILLED AND VACUUMED CAISSON**

Section 503 of the Standard Specifications is hereby revised for this project as follows:

Section 503.01 is hereby revised to include the following:

This work consists of constructing the Traffic Signal Pole and Pedestrian Push Button Post Assembly foundations using either a drill or vacuum method at the locations as shown in the plans and as directed by the Engineer. The placing of reinforcing steel and concrete in the excavated holes to form foundations for traffic signal poles must be in accordance with these specifications and in conformity with the lines and grades on the plan.

The Traffic Signal Pole foundation shall conform to the requirements of the City and County of Denver's Standard Details for Signal Pole Foundations (Drawings 16.1.8 and 16.1.15). The Pedestrian Push Button Post Assembly foundation shall conform to the requirements of the City and County of Denver's Standard Details for Pole Foundations (Drawings 16.1.14).

Section 503.03, delete the first paragraph and replace with the following:

Class BZ concrete shall be used for the Traffic Signal Pole and Pedestrian Push Button Post Assembly foundations. Class BZ concrete in the top three feet of the foundation shall be placed with a 5% to 8% air content. Class BZ concrete shall be placed without air-entrainment below the three-foot depth.

Caisson excavations performed with a vacuum pothole machine will be to prevent drilling through existing utilities. The locations where vacuum method is employed shall be per the approved plans or at the discretion of the Engineer.

Subsection 503.07 shall include the following:

Foundation work shall include raking and/or plumbing of the poles after loading, and grouting by the Contractor after pole rake is approved by the Engineer.

Section 503.08 is hereby revised to include the following:

Caisson (24 Inch and 36 Inch) will be measured by the linear foot from the top of caisson to the bottom of the hole excavated. Furnish of base plate(s), anchor bolts, nuts and nut covers that are required components of the traffic signal pole foundation are incidental to the Contractor's unit cost for traffic signal poles; installation of same shall be considered incidental to the Contractor's unit cost for Drilled and Vacuumed Caissons. Vacuumed caissons shall be quantified and paid for as the Drilled Caisson bid item.

Section 503.09 is hereby revised to include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Drilled and Vacuumed Caisson (24 Inch)	Linear Foot
Drilled and Vacuumed Caisson (36 Inch)	Linear Foot

-2-

**REVISION OF SECTION 503
DRILLED AND VACUUMED CAISSON**

The unit price of drilled or vacuumed caissons (24 and 36 Inch) shall be full compensation for making all excavations; hauling and disposal of excavated material; performing all necessary drilling/pumping; furnishing and placing required concrete and reinforcement steel, including the reinforcement projecting above the tops of the caissons necessary for splicing; all backfilling; removing casings; and for furnishing all tools, labor, equipment, and incidentals necessary to complete the work. No extra payment will be made for casing left in place. Caissons vacuumed in lieu of drilling will be paid as Drilled and Vacuumed Caisson.

The cost for the 24 Inch Caisson associated with the Pedestrian Push Button Post Assembly will be included in the cost of the Pedestrian Push Button Post Assembly pay item.

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Technical Specifications

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019

**CITY AND COUNTY OF DENVER
SPECIAL PROVISIONS
YALE STATION PEDESTRIAN STUDY
PROJECT NO. 2018-PRJ-10001971**

General Contract Conditions shall be the City and County of Denver, Department of Public Works, “Standard Specifications for Construction General Contract Conditions”, 2011 edition and hereinafter modified shall be used for this project.

STANDARD CONSTRUCTION SPECIFICATIONS

The Standard Construction Specifications for this Project shall consist of the applicable sections and subsections, numbered Section 200 through Section 700 and Section 107.12, of the “Colorado Department of Transportation Standard Specifications for Road and Bridge Construction” adopted in 2017 and as hereinafter modified. The City and County of Denver, Department of Public Works, “Standard Specifications for Construction General Contract Conditions,” 2011 edition shall prevail over any conflicting sections and subsections of this document.

The following Project Special Provisions supplement or amend the referenced “Standard Specifications for Road and Bridge Construction” adopted in 2017 by the Colorado Department of Transportation.

DETAILED CONSTRUCTION SPECIFICATIONS

The Detailed Specifications for this project are defined in the City of Denver Contract Requirements and Contract Documents.

STANDARD CONSTRUCTION DETAILS

It is the intent of the City to use applicable details from the Colorado Department of Transportation M&S Standards, the City of Denver’s Wastewater Management Division Standard Details, and the Denver Water Department’s Standard Drawings, most recent editions. Drainage related appurtenances shall follow the City and County of Denver (CCD), Department of Public Works document titled “Storm Drainage and Sanitary Sewer Construction Detail and Technical Specifications”. This document can be found at the following web address: www.denvergov.org

The Colorado Department of Transportation (CDOT) Special Provisions, Standard Special Provisions are to be used for the project. Use CDOT Project Special Provisions that revise the above described documents and prevail over above described documents.

**CITY AND COUNTY OF DENVER
SPECIAL PROVISIONS
YALE STATION PEDESTRIAN STUDY
PROJECT NO. 2018-PRJ-10001971**

The Colorado Department of Transportation’s Standard Specifications for Road and Bridge Construction, dated 2017, controls construction of this project. The following Special Provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and Plans.

PROJECT SPECIAL PROVISIONS

	<u>Date</u>	<u>Page No.</u>
Index.....	(September 23, 2019)	i-iv
Commencement and Completion of Work.....	(September 23, 2019)	5
Revision of Section 107 – Protection of Existing Vegetation.....	(September 23, 2019)	6
Revision of Section 202 – Removal of Asphalt Mat.....	(September 23, 2019)	7
Revision of Section 203 – Equipment.....	(September 23, 2019)	8
Revision of Section 203 – Muck Excavation.....	(September 23, 2019)	9
Revision of Section 203 – Potholing.....	(September 23, 2019)	10
Revision of Section 208 – Erosion Control.....	(September 23, 2019)	11
Revision of Section 214 – Planting.....	(September 23, 2019)	16
Revision of Section 214 – Aggregate Base Course.....	(September 23, 2019)	17
Revision of Section 503 – Drilled and Vacuumed Caisson.....	(September 23, 2019)	18
Revision of Section 608 – Sidewalks and Concrete Curb Ramps.....	(September 23, 2019)	20
Revision of Section 609 – Curb and Gutter.....	(September 23, 2019)	21
Revision of Section 610 – Median Cover Material.....	(September 24, 2019)	24
Revision of Section 613 – Electric Meter Pedestal Cabinet and Base.....	(September 23, 2019)	25
Revision of Section 613 – Electrical Conductor Identification.....	(September 23, 2019)	26
Revision of Section 613 – Electrical Conduit – General.....	(September 23, 2019)	27
Revision of Section 613 – Pull Boxes – General.....	(September 23, 2019)	29
Revision of Section 613 – Lighting (Luminaire) (LED 5300 Lumens).....	(September 23, 2019)	30
Revision of Section 614 – Concrete Footing (Traffic Signal Pole).....	(September 23, 2019)	31
Revision of Section 614 – Pedestrian Signal Face (16) (Countdown).....	(September 23, 2019)	32
Revision of Section 614 – Traffic Control Devices.....	(September 23, 2019)	33
Revision of Section 614 – Traffic Signal Controller and Cabinet.....	(September 23, 2019)	36
Revision of Section 614 – Traffic Signal Cabinet Base.....	(September 23, 2019)	43
Revision of Section 614 – Emergency Vehicle Traffic Signal Priority Control System.....	(September 23, 2019)	45
Revision of Section 614 – Intersection Detection System (FLIR)(Camera).....	(September 23, 2019)	51
Revision of Section 614 – Traffic Signal Poles – General.....	(September 23, 2019)	57
Revision of Section 614 – Telemetry (Field).....	(September 23, 2019)	59
Revision of Section 614 – Uninterrupted Power Supply System.....	(September 23, 2019)	62
Revision of Section 614 – Closed Circuit Television Camera (Traffic Monitoring).....	(September 23, 2019)	78
Revision of Section 614 – Fiber Optic Cable - General.....	(September 23, 2019)	79
Revision of Section 614 – Loose Tube Fiber Optic Cable.....	(September 23, 2019)	82
Revision of Section 614 – Test Fiber Optic Cable.....	(September 23, 2019)	93
Revision of Section 614 – Ethernet Managed Switch.....	(September 23, 2019)	101
Revision of Section 614 – Pedestrian Push Button and Instruction Sign.....	(September 23, 2019)	103
Revision of Section 614 – Pedestrian Push Button Post Assembly.....	(September 23, 2019)	105
Revision of Section 625 – Construction Surveying.....	(September 23, 2019)	106

Revision of Section 629 – Survey Monumentation.....	(September 23, 2019)	109
Revision of Section 630 – Portable Message Sign Panel.....	(September 23, 2019)	112
Revision of Section 630 – Uniformed Traffic Control.....	(September 23, 2019)	114
Revision of Section 630 – Construction Zone Traffic Control.....	(September 23, 2019)	115
Force Account Items.....	(September 23, 2019)	120
Utilities.....	(September 23, 2019)	121
Special Construction Requirements: Traffic Signal Installation		
Personnel Requirement	(September 23, 2019)	126

**CITY AND COUNTY OF DENVER
SPECIAL PROVISIONS
YALE STATION PEDESTRIAN STUDY
PROJECT NO. 2018-PRJ-10001971**

CDOT STANDARD SPECIAL PROVISIONS

Name	Date	No. of Pages
Affirmative Action Requirements – Equal Employment Opportunity	(July 3, 2017)	10
Special Construction Requirements, Fire Protection Plan	(July 3, 2017)	2

**COMMENCEMENT AND COMPLETION OF WORK
(FLOATING START DATE)**

The Contractor shall select the date that contract time begins for this project, subject to the following conditions:

- (a) The earliest date shall be **March 16th**.
- (b) The latest date shall be **TBD**.
- (c) The Contractor shall notify the Engineer, in writing, at least 30 days before the proposed beginning date. If the earlier date, as stated above, follows the award date by less than 30 days, the Contractor's written notice to the Engineer shall be at least 10 days before the proposed beginning date.
- (d) The date that contract time begins shall be subject to the Region Transportation Director's approval. A different date may be authorized in writing by the Chief Engineer in the "Notice to Proceed."

The Contractor shall complete all work within 180 calendar days in accordance with the "Notice to Proceed."

If materials stockpiling begins before the beginning date, contract time will not be charged for the stockpiling effort. Stockpiling of materials before the beginning date is subject to the Engineer's approval. If such approval is given, stockpiled material will be paid for in accordance with Sections 109 and 626.

**REVISION OF SECTION 107
PROTECTION OF EXISTING VEGETATION**

Section 107 of the Standard Specifications is hereby revised for this project as follows:

Subsection 107.12 shall include the following:

The Contractor shall save all existing vegetation (including trees, shrubs, ground covers, grasses, wetlands & riparian) in this area, except for that vegetation, which must be removed to accommodate construction of the project, per the plans. Specific areas of vegetation to be protected shall be as directed by the Engineer and shall be protected as directed by the Engineer.

- The tree on the Northeast corner of the intersection adjacent to the sidewalk shall be protected as described in the tree protection detail.
- Protective fence shall be installed along the Right of Way limits in the Northeast corner to ensure no work is done and no vegetation is impacted outside of the Right of Way.

The Contractor shall perform all the work in such a manner that the least environmental damage will result. All questionable areas or items shall be brought to the attention of the Engineer for approval prior to removal or any damaging activity.

The Contractor shall promptly report any vegetation damaged or scarred during construction to the Engineer for assessment of damages. Damaged or destroyed protected vegetation, shall be replaced at the expense of the Contractor. Vegetation of replaceable size shall be replaced at the Contractor's expense.

Payment will be made under:

Pay Item	Pay Unit
Plant Protection Fencing	Linear Feet

**REVISION OF SECTION 202
REMOVAL OF ASPHALT MAT**

Section 202 of the Standard Specifications is hereby revised for this project as follows:

In subsection 202.02 delete the seventh paragraph and replace with the following:

Removed concrete and asphalt material shall be recycled as described in City and County of Denver Executive Order 123 or disposed of per City and County of Denver Executive Order 115.

Subsection 202.11 shall include the following:

The removal of the existing asphalt mat will be measured by the area, in square yards, completed to the full depth and accepted.

Subsection 202.12 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Asphalt Mat	Square Yard

**REVISION OF SECTION 203
LABOR**

Section 203 of the Standard Specification is hereby revised for this project as follows:

Subsection 203 shall include the following:

This work consists of furnishing workers and hand tools for construction work not otherwise provided for on this project. Work will be directed at the discretion of the Project Manager.

Subsection 203.12 shall include the following:

Payment will be made under:

Pay Item
Laborer

Pay Unit
Hour

**REVISION OF SECTION 203
MUCK EXCAVATION**

Section 203 of the Standard Specification is hereby revised for this project as follows:

Subsection 203 shall include the following:

Muck Excavation will be used at the discretion of the Project Manager for work, as necessary, on the project.

Subsection 203.12 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Muck Excavation	Cubic Yard

The unit price for Muck excavation shall include all equipment necessary for the removal, loading, and transportation of muck for disposal.

REVISION OF SECTION 203 POTHOLING

Section 203 of the Standard Specification is hereby revised for this project as follows:

Subsection 203.05(f) Excavation shall include the following:

The work shall include One Pothole per utility per conduit crossing or as approved by the Engineer.

All surface material disturbed by potholing shall be restored in kind in accordance with the provisions of the most recent release of the *Standards and Details for the City and County of Denver*.

- All potholes must be core drilled.
- All potholes must be backfilled using only one of the following methods:
 - Wet Sand
 - Flowfill
 - Flashfill
 - The Contractor may submit a written request to use a material not specified above (squeegee, pea gravel, and native material will not be allowed)
- Potholes in an asphalt street must be patched back using hot bituminous asphalt, minimum 9- inch in depth.
- Potholes in a concrete street must be patched back with fast curing high strength concrete no less than 8000 psi in 28 days and a 3000 psi in 60 minutes.
- Full concrete panel replacement is required when a third pothole is core drilled in the same panel. The contractor that cut the last pothole (i.e. 3rd) will be required to replace the panel.
- Any pothole in a sidewalk will require a full panel replacement.
- Any pothole in the curb and gutter or any drainage way will require at a minimum, a half panel replacement.

Delete Subsection 203.11(e) and replace with the following:

a) Potholing. The unit price of potholing will be measured by the hour that actual potholing is occurring. All other related work, including removal of existing pavement, backfilling, shoring and labor will not be measured and paid for separately, but shall be included in the work. All surface material disturbed by potholing shall be restored in kind in accordance with the provisions of the Standards and Details for the City and County of Denver (Latest Revision). FOR CCD Streets (all) – related work also includes permanent backfill with CLSM (flow fill or flashfill), permanent asphalt patches in asphalt street, and new concrete panel for sidewalk if one pothole in sidewalk, new street concrete panel if 3 or more potholes result after work is done. Follow CCD TS&D for restoration.

-1-

**REVISION OF SECTION 208
EROSION CONTROL**

Section 208 of the Standard Construction Specifications is hereby removed in its entirety and replaced with the following:

PART I: DEFINITIONS

Definitions used for this Section shall consist of those listed in Title 1 of the City and County of Denver “Standard Specifications for Construction, General Contract Conditions”, 2011 edition.

Definitions used for this Section hereby incorporate those identified within the City and County of Denver Construction Activities Stormwater Manual (CASM).

Additional Definitions applicable to this Section are listed heretofore:

Basis of Payment: The terms under which “Work” is paid, as a designated “Pay Item” in accordance with the quantity measured and the “Pay Unit.”

Best Management Practices (BMPs): Schedules of activities, prohibitions of practices, installation of devices, maintenance procedures, and other management practices deployed to stabilize the construction site to prevent or reduce the pollution of State Waters (see definition below). Stormwater BMPs can be classified as "structural" (i.e., devices installed or constructed on a site) or "non-structural" (procedures, such as modified landscaping practices).

Colorado Department of Health and Environment (CDPHE): State of Colorado, Water Quality Control Division responsible for issuance of State Construction Stormwater Permit.

Construction Activities Stormwater Discharge Permit (CASDP): Permit issued by the City for compliance with City & County of Denver Revised Municipal Code and Department of Public Works Rules & Regulations concerning the discharge of pollutants in storm generated runoff from construction sites to Municipal Separate Storm Sewer System (MS4, see definition below) or State Waters, via the Municipal Separate Storm Sewer System (MS4).

Construction Activities Stormwater Manual (CASM): City and County of Denver Construction Activities Stormwater Manual (CASM), 2010 edition.

Colorado Department of Transportation (CDOT): State agency that has published standards for Erosion Control with accompanying Erosion Control Supervisor certification courses.

Erosion Control Supervisor (ECS): The Erosion Control Supervisor is assigned by the Contractor to perform duties as described in this Section. The ECS shall be properly trained in BMPs per requirements of Part V below, and shall be under the direction of a Professional Engineer licensed in the State of Colorado when performing any modifications to the Project Stormwater Management Plan (SWMP).

Final Stabilization: Point of construction when all ground surface disturbing activities at the site have been completed and uniform vegetative cover has reached 70% of pre-disturbance vegetative cover, or equivalent permanent features have been employed. At this point, all temporary BMPs can be removed, all construction and equipment maintenance wastes have been disposed of properly; and all elements of the Stormwater Management Plan have been completed.

-2-

REVISION OF SECTION 208 EROSION CONTROL

Major SWMP Modification: Changes to the original SWMP that removes or adds additional area to the Project, or modifies the final hydrology or drainage of the Project. A Major SWMP Modification requires the submission of revised Stormwater Management Plan (SWMP) elements to the Permit Authority for review and approval. Any adjustments to a SWMP must be performed either by or under the direction of a Professional Engineer licensed in the State of Colorado.

Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- a) Owned or operated by a State, city, town, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of stormwater or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under Section 208 of the Federal Clean Water Act that discharges to State Waters;
- b) Designed or used for collecting or conveying stormwater;
- c) Which is not a combined sewer; and
- d) Which is not part of a Publicly Owned Treatment Works (POTW).

Permit Authority: The Department authorized by the City to review and process CASDP Applications for Capital and/or governmental sponsored Projects. The responsible City department serving as the Permit Authority is the Public Works Project Controls Office. As a clarification, the Development Services Department of the City serves as the point of intake and permit processing center.

Permit Enforcement Authority: The Department authorized by the City to inspect and enforce CASDP Rules and Conditions for all construction Projects within the City's MS4 Boundary. The responsible City department serving as the Permit Enforcement Authority is the Wastewater Management Division of the Department of Public Works.

State Construction Stormwater Permit: Colorado Revised Statutes require that all construction sites/development Projects, which, by definition, disturb one or more acres in area, shall be covered by a State issued general permit for construction activities. Information on the application requirements for the State permit can be obtained by phone at 303-692-3500; or by visiting their offices located at 4300 Cherry Creek Drive South, Denver, CO 80246-1530; or on the Web at: www.cdphe.state.co.us

State Waters: Any and all surface waters which are contained in or flow in or through this State, not to include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

Examples of State Waters include, but are not limited to, perennial streams, intermittent or ephemeral gulches and arroyos, ponds, lakes, reservoirs, irrigation canals or ditches, wetlands, stormwater conveyances (when they discharge to a surface water), and groundwater.

-3-

**REVISION OF SECTION 208
EROSION CONTROL**

Stormwater Management Plan (SWMP): The Stormwater Management Plan contains the requirements necessary to accomplish all of the following:

The SWMP establishes a minimum standard to construct, install, maintain, and remove required BMPs during the life of the Contract to prevent or minimize pollution of stormwater due to erosion, sediment transport, and construction related pollutant generated during all phases of the Project. A SWMP consists of the following elements:

- (i) CASDP Narrative Worksheet with Narrative Report. The Narrative Report and supporting documents should fully address the methods to be used to prevent sediment, debris, and other pollutants from entering the MS4 and/or State Waters in and around the Project area. Proposed structural and non-structural BMPs should be described with sufficient implementation detail to insure that the logical phases of the proposed construction Project meet the performance standards listed in the CASM.
- (ii) Proposed site drawings and Best Management Practice (BMP) installation details as they apply to the site conforming to the Urban Storm Drainage Criteria Manual, Vol. 3, "Best Management Practices", most current version as issued by the Urban Drainage and Flood Control District (UDFCD), or those established by the City's Department of Public Works. If erosion control drawings were included within the bid documents for the Project, they shall be used for bid purposes and initial planning/deployment of BMPs on the Project. If provided drawings are signed/ sealed by a Professional Engineer, they have been pre-approved by the Permit Authority and may be used without revision for purposes of submitting for CASDP. If provided drawings do not have signature/seal of a Professional Engineer licensed by the State of Colorado, they will require revision by the Contractor with Professional Engineer signature/seal prior to submission to the City and County of Denver for CASDP.
- (iii) Supporting documentation related to proposed BMPs that are not currently identified in UDFCD Vol. 3 or as otherwise published by the City.

SWMP elements submitted to the City shall also meet currently established criteria of the CDPHE as the SWMP must meet all local, State and Federal requirements.

Substantial Completion of Erosion Control: Point of construction when permanent BMPs have been installed, initial growth is in place, and the site is waiting for vegetative cover to reach 70% of pre-disturbance vegetative cover.

PART II: DESCRIPTION

This Work shall consist of constructing, installing, maintaining, and removing when required, BMPs during the life of the Contract until Final Stabilization to prevent or minimize erosion, sedimentation, and pollution of any waters including storm, drainageways, MS4, State Waters, and/or wetlands. Work under this Section includes the Contractor obtaining required Permits, utilizing SWMP elements provided in the Contract, and/or SWMP elements specifically prepared by the Contractor as defined herein. The work shall also consist of providing on-going maintenance and monitoring of the SWMP as may be necessary due to the specific and/or dynamic needs of the Project as well as meet all requirements set forth within the CASM.

-4-

REVISION OF SECTION 208 EROSION CONTROL

The Contractor shall coordinate the construction of temporary BMPs with the construction of permanent BMPs to assure economical, effective, and continuous erosion and sediment control and water pollution prevention throughout the construction period until Final Stabilization is achieved

When a provision of this Section or an order by the Permit Enforcement Authority requires that an action be immediate or taken immediately, it shall be understood that the Contractor shall at once begin effecting completion of the action and pursue it to completion in a manner acceptable to the Permit Enforcement Authority, and in accordance with applicable Permitting requirements.

PART III: MATERIALS

Materials to be used for BMPs shall conform to each specific detail as set forth within the Project SWMP or as noted on the Contract Drawings.

PART IV: EROSION CONTROL PERMIT STATUS

The current SWMP status for the Project is as follows:

A CDPS-SCP is currently not required for this project as the proposed disturbed area and/or proximity to stream does not meet the minimum criteria for requiring a CASDP. All provisions of the following Parts V-VIII of this Section are hereby deleted and shall not be made part of the Project. However, the responsibilities for minimizing sediment pollution from the Project have not been waived, and as such, the City hereby requires the Contractor to perform as specified in the following notes.

“A CASDP Permit will not be required for this project, however, the Contractor and/or their authorized agents shall ensure that all potential pollutants generated during demolition, excavation, trenching, boring, grading, or other construction Work associated with this permit, be prevented from discharge to stormwater conveyance systems in the vicinity of the Project.

The Contractor and/or their authorized agents shall remove all sediment, mud, construction debris, or other potential pollutants that may have been discharged to or, accumulate in the flow lines of storm drainage appurtenances and public rights of ways of the City and County of Denver as a result of construction activities associated with this Project. All removals shall be conducted in a timely manner.

The Contractor shall be held responsible for remediation of any adverse impacts to the CCD or City of Englewood MS4, State Waters, waterways, wetlands, and or other public or private properties, resulting from work done as part of this Project.

The Contractor and/or their authorized agents shall insure that all loads of cut and fill material imported to or exported from the Project shall be properly covered to prevent loss of the material during transport on public rights of way.” (Sec.49-552; Revised Municipal Code)

The use of rebar to anchor best management practices, other than portable toilets, is prohibited.

-5-

**REVISION OF SECTION 208
EROSION CONTROL**

Approved erosion and sediment control 'Best Management Practices' shall be maintained and kept in good operating condition for the duration of the Project. All necessary maintenance and repair shall be completed immediately upon discovery of any deficiency or defect.

The Contractor and/or their authorized agents shall implement the Best Management Practices (BMPs) listed in the General Notes on site during construction:

PART V: BASIS OF PAYMENT

Erosion Control items as specified in Part V shall be paid in accordance with Section 208. All other Erosion Control items will not be measured and paid for separately but shall be included in the project Force Account for Erosion Control.

Payment will be full compensation for all work, materials and equipment required to complete the item, including surface preparation, maintenance throughout the project, and removal upon completion of work.

<u>Pay Item</u>	<u>Pay Unit</u>
Aggregate Bag	Linear Foot
Concrete Washout Structure	Each
Storm Drain Inlet Protection (Type 1)	Linear Foot
Erosion Control Supervisor	Hour

-1-
**REVISION OF SECTION 214
PLANTING**

Subsection 214.01 shall include the following:

This work consists of replacing all landscaping, including associated irrigation, that was damaged as part of the work. See Section 107 for protection of existing vegetation requirements.

Subsection 214.06 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Landscape Maintenance	Lump Sum

-1-

**REVISION OF SECTION 304
AGGREGATE BASE COURSE**

Section 304 of the Standard Specification is hereby revised for this project as follows:

Subsection 304.02 shall include the following:

Material for the base course shall be Aggregate Base Course (Class 6) as shown in subsection 703.03. Aggregate base will be used at the discretion of the Project Manager for work, as necessary, on the project.

Subsection 202.12 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Aggregate Base Course (Class 6)	Cubic Yard

**REVISION OF SECTION 503
DRILLED AND VACUUMED CAISSON**

Section 503 of the Standard Specifications is hereby revised for this project as follows:

Section 503.01 is hereby revised to include the following:

This work consists of constructing the Traffic Signal Pole and Pedestrian Push Button Post Assembly foundations using either a drill or vacuum method at the locations as shown in the plans and as directed by the Engineer. The placing of reinforcing steel and concrete in the excavated holes to form foundations for traffic signal poles must be in accordance with these specifications and in conformity with the lines and grades on the plan.

The Traffic Signal Pole foundation shall conform to the requirements of the City and County of Denver's Standard Details for Signal Pole Foundations (Drawings 16.1.8 and 16.1.15). The Pedestrian Push Button Post Assembly foundation shall conform to the requirements of the City and County of Denver's Standard Details for Pole Foundations (Drawings 16.1.14).

Section 503.03, delete the first paragraph and replace with the following:

Class BZ concrete shall be used for the Traffic Signal Pole and Pedestrian Push Button Post Assembly foundations. Class BZ concrete in the top three feet of the foundation shall be placed with a 5% to 8% air content. Class BZ concrete shall be placed without air-entrainment below the three-foot depth.

Caisson excavations performed with a vacuum pothole machine will be to prevent drilling through existing utilities. The locations where vacuum method is employed shall be per the approved plans or at the discretion of the Engineer.

Subsection 503.07 shall include the following:

Foundation work shall include raking and/or plumbing of the poles after loading, and grouting by the Contractor after pole rake is approved by the Engineer.

Section 503.08 is hereby revised to include the following:

Caisson (24 Inch and 36 Inch) will be measured by the linear foot from the top of caisson to the bottom of the hole excavated. Furnish of base plate(s), anchor bolts, nuts and nut covers that are required components of the traffic signal pole foundation are incidental to the Contractor's unit cost for traffic signal poles; installation of same shall be considered incidental to the Contractor's unit cost for Drilled and Vacuumed Caissons. Vacuumed caissons shall be quantified and paid for as the Drilled Caisson bid item.

Section 503.09 is hereby revised to include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Drilled Caisson (24)	Linear Foot
Drilled Caisson (36 Inch)	Linear Foot

-2-

**REVISION OF SECTION 503
DRILLED AND VACUUMED CAISSON**

The unit price of drilled or vacuumed caissons (24 and 36 Inch) shall be full compensation for making all excavations; hauling and disposal of excavated material; performing all necessary drilling/pumping; furnishing and placing required concrete and reinforcement steel, including the reinforcement projecting above the tops of the caissons necessary for splicing; all backfilling; removing casings; and for furnishing all tools, labor, equipment, and incidentals necessary to complete the work. No extra payment will be made for casing left in place. Caissons vacuumed in lieu of drilling will be paid as Drilled and Vacuumed Caisson.

The cost for the 24 Inch Caisson associated with the Pedestrian Push Button Post Assembly will be included in the cost of the Pedestrian Push Button Post Assembly pay item.

-1-

**REVISION OF SECTION 608
SIDEWALKS AND CONCRETE CURB RAMPS**

Section 608 of the Standard Specifications is hereby revised to include:

Subsection 608.01 shall include the following:

This work consists of the construction of concrete sidewalks and curb ramps in accordance with these specifications and in conformity with the lines and grades shown on the plans or established.

Concrete Curb Ramp construction shall conform to the requirements of the City and County of Denver's Standard Details for Curb Ramps (Detail 7.0 through 7.7)

Subsection 608.02, delete in its entirety and replace as follows:

Materials shall meet the requirements specified in the following subsections:

Joint Fillers 705.01

Concrete for sidewalks, curb ramps, and bikeways shall be Class "P", Class "B" or Class "D" may be substituted on sidewalks and bikeways not to be driven on by vehicles, as specified in subsections 601.02 and 601.03.

All concrete used for sidewalks, and curb ramps shall be reinforced with polypropylene fibers. Polypropylene fibers shall be FIBERMESH or FORTA FIBRE. Length of fibers shall be as recommended by the manufacturer. Add 1.5 pounds FIBERMESH or FORTA FIBRE per cubic yard of concrete. All concrete (exposed to air and deicing chemicals) shall meet CDOT 601.04 Class 2 sulfate mitigation specifications, unless contractor tests soil and provides an alternative mix that is approved.

ASTM C-1315 cure+seal shall be applied to all paving and flatwork placed September 1 through April 1 to minimize damage from de-icing chemicals.

Detectable warnings on curb ramps shall be Armor-Tile Tactile Systems or approved equal.

Alternate materials may be used, if pre-approved by the Engineer. The Contractor shall submit a sample of the product, the name of the selected supplier, and documentation that the product meets all contrast requirements and will be fully compatible with the curb ramp surface to the Engineer for approval prior to the start of work

Subsection 608.03 shall include the following:

Detectable warnings on curb ramps shall be installed in strict accordance with the manufacturer's recommendations.

Subsection 608.03(a) is hereby revised as follows:

Delete the third sentence and replace with the following:

**REVISION OF SECTION 608
SIDEWALKS AND CONCRETE CURB RAMPS**

Where excavation to the finished grade elevation results in a sub grade of unsuitable soil, the Project Manager may designate the unsuitable material to be removed and replaced with approved material. Removal of unsuitable material shall be backfilled with Aggregate Base Course (Class 6), or other material approved by the Project Manager and will not be paid for separately.

Subsection 608.03(d) is hereby revised to include:

Finishing shall occur only after the disappearance of bleed water. The addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted. Sprinkling of pigment onto the fresh surface will not be permitted.

The Contractor shall insure that new concrete items built under this contract drain properly and, as such, there are no areas of standing water on new concrete items.

Add subsection 608.03(g) as follows:

(g) Protection of New Concrete. The Contractor shall protect all new concrete items built under this Contract against defacement, or other injury, from any cause. If said damage cannot be adequately repaired to the satisfaction of the Project Manager, the Contractor shall remove and replace the unacceptable items at Contractor's expense.

Subsection 608.06 is hereby revised to include:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Detectable Warnings	Square Feet
Concrete Curb Ramp	Square Yard

Excavation to proposed subgrade elevation will not be paid for separately but shall be included in the Work.

All work necessary and incidental to the construction of Concrete Curb Ramp including bed course material, will not be measured and paid for separately but shall be included in the work.

Detectable warning on new curb ramps, including all work and materials necessary for fabrication, transport and installation will be measured and paid for separately.

Payment shall be full compensation for prep work, furnishing, and placing all materials, including detectable warnings, necessary to complete the work to the dimensions shown on plans.

Reconditioning, forms, finishing, jointing, backfill and curing, will be in accordance with the plans and specifications and will not be paid for separately.

-1-

**REVISION OF SECTION 609
CURB AND GUTTER**

Section 609 of the Standard Specifications is hereby revised to include:

Subsection 609.02 is hereby revised to include:

In the first paragraph, reference to Section 703.07, Bed Course Material, shall be deleted.

Paragraph 2 shall be deleted and replaced with the following:

Concrete for Curb and Gutter shall conform to the requirements for Class "P" concrete and include polypropylene reinforcing fibers as specified in subsections 601.02 and 601.03. When curb machines are used, the Contractor will be permitted to use AASHTO M 43 Size 57 or 67 aggregate in lieu of the coarse aggregate specified in Table 601-1, and a lesser slump will be permitted. Dowels are required in the curb and gutter when size 57 or 67 aggregate is used. Any pavement or ROW concrete should be magnesium chloride resistant, so will require CDOT Class 2 Sulfate Mitigation per 601.04, unless contractor tests soil and provides an alternative mix that is approved. Use ASTM C- 1315 cure & seal on flatwork during anticipated de-icer season of October 1st through July 10th and only after all bleed water has risen and been removed.

Subsection 609.03(a) is revised to include:

Excavation shall conform to the requirements of the revisions to Subsection 608.03(a)- Sidewalk and Bikeways.

Subsection 609.03(b) is revised to include:

The Contractor shall construct the work in strict conformity to line and grade stakes. Deviations in excess of 1/2" Horizontal and/or 1/4" Vertical shall be grounds for the Engineer to reject the work. Rejected work will be replaced or corrected by the contractor at no expense to the City. The Engineer will have complete authority in determining whether the work is to be corrected or replaced. If the contractor cannot adequately correct any rejected work, the contractor shall replace the work at no expense to the City.

Subsection 609.03(c) shall be revised to include the following:

The Contractor shall protect all new concrete items built under this Contract against defacement, or other injury, from any cause. If said damage cannot be adequately repaired to the satisfaction of the Engineer, the Contractor shall remove and replace the unacceptable items at Contractor's expense.

Subsection 609.03(d) is hereby revised to include:

For construction of curb and gutter adjacent to existing concrete pavement, the joint pattern shall match that of the concrete pavement. The joint pattern shall be approved by the Engineer prior to construction.

-2-

**REVISION OF SECTION 609
CURB AND GUTTER**

Subsection 609.03(f) is hereby revised to include:

The following paragraphs shall be added:

The Contractor shall insure that new concrete items built under this contract drain properly and, as such, there are no areas of standing water on new concrete items. Any low spots in the new concrete items in excess of 1/4" will require removal and replacement of such items at the Contractor's expense.

Subsection 609.07 is hereby revised to include:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Curb and Gutter Type 2 (Section I-B) (6" Curb and Gutter - 1' Spill Pan)	Linear Foot
Curb and Gutter Type 2 (Section II-B) (6" Curb and Gutter - 2' Spill Pan)	Linear Foot

Excavation to proposed subgrade elevation will not be paid for separately but shall be included in the work.

Payment shall be full compensation for labor and materials to construct to the dimensions shown on plans. Reconditioning, reinforcing steel, forms, finishing, jointing, backfill and curing, will be in accordance with these plans and specifications and will not be paid for separately.

-1-

**REVISION OF SECTION 610
MEDIAN COVER MATERIAL**

Subsection 610.02 is hereby revised to include:

Bituminous median cover material shall conform to the requirements of Section 403 and as shown on the plans. Concrete shall be Class B with polypropylene reinforcing fibers and shall conform to Section 601. Coloring agent, if required, shall be as shown on the plans or specified.

Aggregate for median cover shall conform to the requirements of subsection 703.10.

Plastic sheeting shall be black polyethylene with a minimum thickness of 10 mils or approved equal.

Herbicides shall conform to the requirements of Section 217.

**REVISION OF SECTION 613
ELECTRIC METER PEDESTAL CABINET AND BASE**

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Subsection 613.07 shall include the following:

New traffic signal installations require an Electric Meter Pedestal Cabinet and Base for the new traffic signal. Xcel Energy will furnish only the electric meter. The Contractor shall furnish the electric meter pedestal cabinet, and shall install the pedestal cabinet and base, by a licensed electrician (journeyman), at the locations as show on the plan and in accordance with the City and County of Denver's Standard Drawings 16.1.19 and 16.1.20.

Subsection 613.10 shall include the following:

Electric Meter Pedestal Cabinet and Base will be measured and installed in accordance with these Special Provisions, the Project Standards or as directed by the Engineer. The Electric Meter Pedestal Cabinet and Base installation will include the foundation, groundwork, sweeps, pull cord, copper tracer wire, adapters, fittings, splice couplings, conduit plugs, equipment, labor, and all other items necessary to complete the work.

Contractor shall submit material specifications to the Engineer for prior approval.

Subsection 613.11 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Electric Meter Pedestal Cabinet and Base	Each

**REVISION OF SECTION 613
ELECTRICAL CONDUCTOR IDENTIFICATION**

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Subsection 613.08 shall include the following:

All electrical conductors shall be tagged as follows:

Electrical conductor cable tags shall be located below the termination in the base of the streetlight, in the pull box, in the pedestal, and at the point of termination to existing facilities of the Local Utility Company supplying electrical service. The tags shall be attached with a cable tie. The information written on the tag shall include the direction and approximate length of cable, feeds running from where and to, etc.

Each incoming conductor shall be individually color coded with one (1) tape mark, while outgoing conductors shall have two (2) tape marks.

Example:

FEEDS TO PULL BOX 50' NORTH & 75' WEST THEN TO HIGHWAY SIGN	FEEDS FROM XFMR 250' SOUTH & EAST 200' WEST
---	---

Uniform tags are available in a Tag Kit. *The Tag Kit consists of: 100 tags, 3-part yellow with 1 hole, 100 black nylon ties and 1 black Sharpie pen.

<u>Manufacturers</u>	<u>Catalog Numbers</u>
Uticom Systems Inc.	U5025Y1
Or approved equal	

Subsection 613.11 shall include the following:

Electrical conductor tagging will not be paid for separately, but shall be included in the cost of wiring.

-1-

**REVISION OF SECTION 613
ELECTRICAL CONDUIT – GENERAL**

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Add the following to subsection 613.07:

This work is for the installation electrical conduits. These conduits (laterals) shall be to connect the already installed traffic signal conduits to the traffic signal controller cabinets, electric meters, and traffic signal poles. The conduit installation shall be in accordance with this specification:

Directional boring is the preferred method of conduit installation. If the contractor is unable to jack or bore the conduit at the lengths shown on the plans from pull box to pull box, all splice couplings and associated work to splice the conduit shall be included in the cost of this item. This shall include excavation down to the required depth of conduit at the splice location. Also included in the cost of this item are all landscape repairs, which will be required after excavation of conduit at all splice locations. All splice couplings shall be water and air tight and installed at a depth to match the remaining run of conduit. No elevation difference will be allowed. Splices shall be kept to a minimum and all locations shall be approved by the City. Additional pull boxes shall not be substituted for splices.

All conduit bends, including factory-installed bends, shall not have a bend radius less than six times the inside diameter of the conduit.

The excavations required for the installation of conduit or cable shall be performed in such a manner as to avoid unnecessary damage to streets, sidewalks, landscaping, sprinkler systems and other improvements. Trenches shall not be excavated wider than necessary for the installation of the electrical appurtenances. Excavation shall not be performed until immediately before installation of conduits. The material from the excavation shall be placed in a position not to cause damage or obstruction to vehicular or pedestrian traffic or interfere with surface drainage.

Trenches shall be made with a rock-wheel or other machine capable of cutting a narrow trench (4") so as to allow traffic to pass over prior to back filling. The machine shall be equipped with shields to direct the spoil downward and away from passing vehicles, workmen and pedestrians.

Off-street trenches shall be back-filled with the same material that was removed and shall be compacted and shaped to match the surrounding surface. On-street trenches within ALL roadway areas shall be back-filled with CDOT approved Structure Backfill (Flow-Fill) and capped with 9" minimum of Hot Mix Asphalt Pavement (Patching) in accordance with Section 403 and City and County of Denver Street Cut Regulations if applicable. If surrounding pavement depth is greater than 9 inches, the HMA (Patching) depth shall match the existing pavement.

All surface materials including sprinkler systems, landscaping, shrubs, sod grass, and native growth vegetation which is disturbed by trenching and back-filling operation shall be restored in kind equal to or exceeding the original conditions.

All conduit runs that will not have a copper conductor installed shall have a #12 AWG stranded copper conductor placed inside for locating purposes. Locating conductor and tape will not be measured and paid separately, but shall be included in the unit price for conduit.

-2-

**REVISION OF SECTION 613
ELECTRICAL CONDUIT – GENERAL**

Conduit shall always enter a pull box, hand-hole, or any other type structure from the direction of the run only.

All conduits shall be fully compatible with fiber optic cable. Plastic conduit shall be Schedule 80 in the diameters shown on the plans and shall be compliant with Bellcore TW-NWT-000356 requirements. Each conduit shall be equipped with a pull tape and each bore shall have a copper tracer wire of at least 12-gauge.

Plastic PVC conduit shall be certified by the manufacturer as meeting ANSI/UL 6 and 651. The manufacturer shall be ISO 9000 compliant.

All conduit bends, including factory-installed bends, shall not have a bend radius less than six times the inside diameter of the conduit.

Conduit plugs for sealing conduit shall also be supplied and installed in all open conduit ends as soon as the conduit is installed. Plugs shall be durable, fabricated from no metallic parts, be of the split design to allow removal and reinstallation around in-place cables and be easily removable and reusable. Plugs shall be capable of being installed by hand without any tools and shall provide a water and air tight seal of at least 100 psi and shall cause no damage to the cable when installed.

At some locations (as illustrated on the Plans or in these specifications, or as directed by the Engineer), new conduits shall be installed in an existing pull box. At these locations, the Contractor shall carefully excavate around the pull box and install the new conduit in the pull box in a manner that meets the requirements of this Special Provision. The Contractor shall not damage the existing pull box. If the existing pull boxes or concrete collars are cracked or damaged during conduit installation, the Contractor shall be required to replace either or both conforming to the requirements of the contract at no additional cost.

Subsection 613.10 shall include the following:

Electrical Conduit will be measured by the linear feet of conduit installed in accordance with these Special Provisions, the Project Standards or as directed by the Engineer. Electrical Conduit will include groundwork, sweeps, pull cord, copper tracer wire, adapters, fittings, splice couplings, conduit plugs (for conduits both with and without fiber optic cable), equipment, labor, and all other items necessary to complete the work.

Subsection 613.11 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
2 Inch Electrical Conduit (Plastic)	Linear Foot
3 Inch Electrical Conduit (Plastic)	Linear Foot
2 Inch Electrical Conduit (Bored)	Linear Foot
3 Inch Electrical Conduit (Bored)	Linear Foot

**REVISION OF SECTION 613
PULL BOXES – GENERAL**

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Subsection 613.07 shall include the following:

Pull Box (Type 2) shall be the Type A (Electric) and Pull Box (Type 3) shall be the Type B (Traffic) pull boxes used in all signal conduit installation. Pull boxes shall be made of fiberglass reinforced polymer concrete designed to support a minimum service load of 20,000 pounds over a 10 inch by 10 inch square. The pull boxes shall have detachable covers with skid-resistant surfaces and have the words “TRAFFIC” or, “ELECTRIC” physically impressed (not painted) on top. The cover shall be attached to the pull box body by means of screw-in bolts and shall have two lift slots to aid in the removal of the lid. Non-standard bolts shall not be used.

Pull Box (Special) shall be the Type C (24X36X24) (Traffic Communications) pull boxes. All traffic communication pull boxes shall have the words “TRAFFIC COMM” physically impressed (not painted) on its top. The covers shall be attached to the pull box body by screw-in bolts and shall have two lift slots to aid in the removal of the lid.

All concrete collars, footings, and location marker supports shall be Portland Cement Concrete Class B and shall be in accordance with Section 601.

Pull boxes that are to be in traveled ways shall be outfitted with traffic bearing lids rated for HS 20-44 loads. The pull boxes shall have a special concrete footing extending 8 inches around the outside and 6 inches around the inside of the pull box bottom, as shown in the plans. Pull boxes installed in dirt or landscape areas shall have a 12-inch-wide by 6-inch-thick concrete collar placed around the top in lieu of the concrete footing, as shown in the plans.

When the plans call for a fiber optic cable location marker to be installed at the pull box location, the concrete foundation support for the location marker shall be placed monolithically with the concrete collar.

Subsection 613.12 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Pull Box (Type 2)	Each
Pull Box (Type 3)	Each
Pull Box (Special)	Each

Installation of the new pull boxes, modification of conduit ends, restoration of disturbed surface materials, and all other work necessary for the installation of Pull Box (Type 2), Pull Box (Type 3), and Pull Box (Special) will not be measured and paid for separately but shall be included in Pull Box (Type 2), Pull Box (Type 3), and Pull Box (Special).

Pull Box (Type 2), Pull Box (Type 3), and Pull Box (Special) will be paid for on the basis of the number of pull boxes installed.

**REVISION OF SECTION 613
LIGHTING (LUMINAIRE) (LED 5300 LUMENS)**

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Subsection 613.02 shall include the following:

The Contractor shall furnish and install LED Street Light Luminaire at locations as shown on the plans. The LED Street Light Luminaire shall be compatible or interchangeable with standard LED Street Light Luminaire as stocked by the City and County of Denver.

The current LED Street Light Luminaire that are compatible with that stocked by the City and County of Denver is as follows:

<u>Manufacturer</u>	<u>Catalog Numbers</u>
E-Lite Star	ESU-CA012M03042S-525CCD1-1

The luminaire shall also include a photo cell (S-T P124-1.5-PTW or equal) and the luminaire finish shall be in Federal Green.

The Contractor shall submit a lighting materials list to the City and Denver for approval prior to ordering. Contact Chris Lillie at 720-865-4066.

Subsection 613.08 shall include the following:

At least one grounding electrode shall be installed adjacent to each light standard. Wiring shall be a 120/240 volt or 120/208 volt, 3-wire system with individual luminaires wired for 120 volts.

Subsection 613.11 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Luminaire (LED) (5300 Lumens)	Each

Luminaire shall be measured and paid by the number of luminaires installed. The item shall include all labor, materials, and ancillary hardware required to provide a fully-functional system to the satisfaction of the Engineer.

**REVISION OF SECTION 614
CONCRETE FOOTING (TRAFFIC SIGNAL POLE)**

Section 614 of the Standard Specifications is hereby revised to include the following:

Subsection 614.01 shall include the following:

This work consists of installing concrete footing (foundations) for traffic signal street light poles (no mast arms). Locations of the concrete footing (foundations) are shown on the plans or as directed by the Engineer.

Subsection 614.08 (g) shall include the following:

Concrete Footing (Traffic Street Light Pole Steel – no mast arm) shall conform to the requirements of the City and County of Denver’s Traffic Signal Standard Detail Sheet No. 16.1.16.

Subsection 614.13 shall include the following:

Concrete Footings for Traffic Street Light Pole Steel (no mast arm) will not be measured and paid for separately but shall be included in the cost Traffic Signal Light Poles installation.

**REVISION OF SECTION 614
LED PEDESTRIAN SIGNAL FACE (16) (COUNTDOWN)**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work includes the installation of LED Pedestrian Signal Faces with countdown timers as shown in the Contract.

Subsection 614.08 (h) shall include the following:

Pedestrian signal faces with count down timers shall meet the following requirements:

- The dimensions of the signal housing and the LED symbols, as well as moisture and dust resistance requirements shall be in accordance with the current ITE PTCSI Standards.
- Signal housing shall be aluminum, painted in Federal Green and “clam-shell” mounted.
- The signal shall have user-selectable modes for countdown for walk cycle only, pedestrian cycle only, or both walk and pedestrian clearance.
- The countdown module shall have an internal conflict monitor to prevent any possible conflicts between the Hand/Person signal indications and the time display. The display shall not countdown during a Solid Hand indication.
- LED symbols shall be solid icons and shall provide uniform light dispersion such that the “pixel” effect is minimized. Lettered or outline symbol styles will not be permitted.
- The Man/Hand configuration shall provide clear and distinct lamination where either symbol is in use.
- The LED module shall be rated for use in an ambient operating temperature range of -40° F to 165° F.
- The signal shall meet NEMA Standard TS2 for voltage surge protection and shall have an automatic reset in case of a power outage.

Subsection 614.13 shall include the following:

LED Pedestrian Signal Face (16) (Countdown) will be measured by the actual number of units that are installed and accepted.

Subsection 614.14 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Pedestrian Signal Face (16) (Countdown)	Each

-1-

**REVISION OF SECTION OF 614
TRAFFIC CONTROL DEVICES**

Section 614 of the Standard Specification is hereby revised for this project as follows:

Subsection 614.08 (h) shall include the following:

“Light Emitting Diode” (LED) signal lenses shall be installed in all Red, Yellow, and Green signal displays. The LED signal lenses for the 12” circular balls and 12” circular arrows are hereby added to the Standard Specifications and shall comply with the following specifications:

Manufacturer Requirements and Approvals:

- The manufacturer supplying product to this specification shall have a minimum of 13 years of experience in the manufacture of LED Traffic Signals with High Flux LEDs used in the North American market.
- Manufacturers supplying products to this specification must be a registered participant and have the unique long-life module part numbers being provided certified and listed on the Intertek-ETL LED Traffic Signal Modules Certification Program approved products website prior to bid opening.
- Manufacturers supplying products to this specification shall manufacture and assemble product on an Intertek ETL audited line located in the USA.
- Unique part number shall be listed on manufacturers label proving difference between standard modules and long-life modules.
- If requested, documentation shall be provided by manufacturer demonstrating the changes made to their standard product that allows for ITE specification compliance over 15-year warranty period.

Physical & Mechanical Requirements:

General

- Tinted or Non-Tinted Lens. Unless designated otherwise in the below table the standard lens color shall be tinted with a color meeting the colors required in paragraph 4.2 of the ITE specification. The products shall be available with non-tinted lenses as an option.
- The LED module shall utilize high flux LEDs rated at 1 watt or higher and have an incandescent, non-pixelated appearance when illuminated. The use of low power LEDs, for example 5 mm LEDs, is not permissible in the design and production of long-life arrow products.
- The external lens shall have a smooth outer surface to prevent the buildup of dirt/dust and shall be designed to minimize the potential for sun phantom signals.
- All LEDs utilized to illuminate circular signal modules, shall be LEDs that have been manufactured utilizing materials that have industry acceptance as being suitable for uses in outdoor applications. At no time is the use of LEDs that utilize AlGaAs technology acceptable.
- The thermal management system used in the traffic ball must be self-contained and internal to the traffic module. At no time shall the thermal management system used for the power supply or LEDs form any part of the external surface of the LED module.
- All plastic components shall be molded and assembled in the USA. This includes: back housing, spreading lens and front lens. Certificate of manufacturing location must be available and supplied at time of bid requested.

-2-

**REVISION OF SECTION 614
TRAFFIC CONTROL DEVICES**

All lenses shall be hard coated in the USA. Certificate of manufacturing location must be available and supplied at time of bid requested. All reflectors shall be metalized in the USA. Certificate of manufacturing location must be available and supplied at time of bid requested.

Module Identification

1. In addition to the required ITE labeling all modules must be labeled with the ETL Verified label shown in Figure 1. This label designates the compliance and listing with the Intertek-ETL Traffic Signal Certification Program.

Electrical:**General**

- The following color scheme shall be used for all modules AC power leads: White for Common, Red for the Red ball signal, Yellow for the Yellow ball signal, and Brown for the Green ball signal.
- The AC power leads shall exit the module via a rubber grommetted strain relief, and shall be terminated with insulated female quick connect terminals with spade/tab adapters. The leads shall be separate at the point at which they leave the module.
- All external wiring utilized in the LED traffic signal module shall be anti-capillary type wire to prevent the wicking of moisture to the interior of the module.
- LED Module and power supply shall be design to remain ITE compliant over a 15 year life.
- To minimize the temperature exposure of the power supply all power supplies should be located at the bottom of the module when the arrow is facing left.
- For additional protection from moisture, all power supplies shall be conformal coated for additional protection.

Transient Voltage Protection

- In addition to the transient test requirements defined in the Design Qualification Testing section of ITE Vehicle Traffic Control Signal Heads (VTCSH) specification all power supplies used in the circular signals supplied to this specification shall be capable of passing an additional ring-wave surge testing in accordance with the IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000V and less) AC Power Circuits, ANSI/IEEE C62.41.2-2002, 6KV, 100 kHz ring-wave with an output impedance of 30 ohms. The short circuit current shall be 200 Amps.

Power

- Typical wattages at 25 o C for the 12” circular arrow LED traffic Signal Modules shall be: Red - 8 watts, Yellow - 13 watts, and Green - 8 watts.
- Typical wattages at 25o C for the 12” circular ball LED traffic Signal Modules shall be: Red - 7 watts, Yellow - 11 watts, and Green - 7 watts.

Quality Assurance General

- Upon Request, the supplier must provide an Intertek-ETL test report for the base model being supplied to this specification.

-3-

**REVISION OF SECTION 614
TRAFFIC CONTROL DEVICES**

- The base products must be listed in the Intertek Directory of LED Traffic Signal Modules Certified Products listing at the time of bid. Upon request the supplier must provide a copy of the listing in the bid package.

Warranty Requirements:

Warranty

- Manufacturers shall provide a detailed written warranty issued by the factory of module origin with the following minimum provisions:
- Modules shall, at the manufacturer's option, be repaired or replaced if the module fails to function as intended due to workmanship or material defects within the first 15 years from the date of delivery.
- Modules shall, at the manufacturer's option, be repaired or replaced if the module exhibit luminous intensities less than the minimum specified values within the first 15 years of the date of delivery.
- Upon request, the LED lamp module manufacturer shall provide written documentation of its ability to satisfy a worst-case, catastrophic warranty claim.
- A current corporate annual report duly-certified by an independent auditing firm, containing financial statements illustrating sufficient cash-on-hand and net worth to satisfy a worst-case, catastrophic warranty claim is an example of suitable documentation.
- The documentation shall clearly disclose:
 - o The country in which the factory of module origin is located
 - o The name of the company or organization that owns the factory of module origin including any and all of its parent companies and/or organizations, and their respective country of corporate citizenship
- For firms with business and/or corporate citizenship in the United States of less than fifteen years, the process by which the end-users/owners of the modules will be able to obtain worst-case, catastrophic warranty service in the event of bankruptcy or cessation- of-operations by the firm supplying the modules within North America, or in the event of bankruptcy or cessation-of-operations by the owner of the factory of origin, shall be clearly disclosed.

Subsection 614.14 shall include the following:

LED signal lenses shall be included in the cost of the item for Traffic Signal Face and will not be paid for separately.

-1-

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET**

**Section 614 of the Standard Specifications is hereby revised for this project as follows:
Subsection 614.01 shall include the following:**

This work shall consist of furnishing, assembling, programming, and installing a completed Traffic Signal Controller and Cabinet assembly. The Cabinet assembly shall be assembled in accordance with the City and County of Standards and Specifications, and the completed Traffic Signal Controller and Cabinet shall include but not limited to the traffic signal controller, malfunction management unit (MMU), vehicle detector amplifiers, other ancillary hardware, and traffic signal cabinet base as per City and County of Denver standards. The Contractor shall install the completed Traffic Signal Controller and Cabinet assembly at the locations as shown in the plans.

Delete Subsection 614.08 (b), and replace with the following:

1.1 Applicable Standards

All electronic components, workmanship, and functionality of the traffic signal controller shall conform to the applicable standards for TS-2 traffic signal controllers mandated by the National Electrical Manufacturers Association's (NEMA) current edition NEMA Standards Publication TS2-2003 v02.06 for Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements. Controller engine board and operating system shall support open architecture and be compliant with current ITE, AASHTO, and NEMA Standard Publication for Advanced Transportation Controllers (ATC) 5201.

All major components shall meet the environmental, design, and operating standards outlined in NEMA Standards Publication TS2-2003 v02.06, Section 2.

These standards specify minimum requirements for the traffic signal controller except where requirements specified in this document exceed the aforementioned documents.

1.2 Hardware

1.2.1 Enclosure

The Controller enclosure shall be designed for placement on a shelf. The enclosure shall be aluminum with a protective finish and enclose all electrical components of the controller. The enclosure size shall be equal to or less than the following: TS-2 Type 1 Controller: 8.5" Tall x 8.5" Deep x 14 ¾" Wide; TS-2 Type 2 Controller: 10 3/8" Tall x 8.5" Deep x 14 ¾" Wide. All hardware and electrical components shall be modular for ease of replacement and repair. All controller input/output connectors, fuse holders, indications, displays, switches and control devices required for the operation and adjustments of the controller shall be mounted on the front panel. The front panel of the controller shall be permanently marked to identify I/O connections, fuse holders, indicators, etc.

1.2.2 Additional Hardware Requirements

- Power supply must be capable of supplying 95-250 VAC 50/60HZ Auto Sensing

-2-

REVISION OF SECTION 614 TRAFFIC SIGNAL CONTROLLER AND CABINET

- Engine Board and CPU shall be compliant with the ATC 5201 Standard as noted above and shall meet the following additional specifications:
 - Minimum Processor: Motorola PowerPC (Freescale) 8248 Processor;
 - 32-bit
 - 750 MIPs at 400 MHz
 - Minimum Required Memory
 - 1 MB SRAM
 - 64 MB SDRAM
 - 64 MB DRAM
 - On-board 5-Pin USB Motherboard Connector
- There shall be no batteries or moving parts such as fans or memory storage devices with rotating parts on the controller unit.
- Display shall be a 16-line x 40-character LCD.
- All keypads to be mounted on the controller front panel and are to be weather resistant and backlit
- Controller hardware shall facilitate the use of the controller in TS-2 Type 1 traffic signal control cabinets.

1.2.3 Communications Ports

In addition to the NEMA TS-2 with NTCIP v02.06 Standard, the traffic signal controller shall include the following communications ports and configurations:

- Ethernet Support:
 - Side mounted, four-port 10/100 Mbit Ethernet network switch
 - Front panel mounted four-port 10/100 Mbit Ethernet network switch
 - Integrated network card supporting two independent, user programmable subnets (IP Address, Subnet Mask, and Default Gateway)
- USB Support
 - Front Mounted three-port Universal Serial Bus (USB) Hub
 - Side Mounted single USB port

1.3 Operating System

1.3.1 O/S Version

The Traffic Signal Controller shall use a Linux operating system (O/S) with kernel version 3.14 or later and shall include standard POSIX libraries for application support including real-time extensions of POSIX 1003.1b. To facilitate application level access to the ATC hardware, a Board Support Package (BSP) shall be provided by the controller manufacturer for access to hardware-specific drivers.

The operating system shall include enabled support for cgroups (control groups) for the purpose of limiting, accounting for, and isolating resource usage (CPU, Memory, etc.) of all running processes to ensure the reliability and stability of the traffic signal control application.

The Linux operating system shall include an application programming interface in compliance with the ITE, AASHTO, and NEMA Application Programming Interface (API) Standard 5401 for the ATC v2.0.

-3-

REVISION OF SECTION 614 TRAFFIC SIGNAL CONTROLLER AND CABINET

1.3.2 O/S Updates

Operating System updates shall be completed from a personal computer over an Ethernet connection and also directly from a USB flash drive plugged into the controller's front panel. The update process shall be automated and packaged as a simple executable file enabling the user to perform the update within a few steps. Minor operating system updates shall allow the user to perform the operating system update without removing the controller from operation or without placing the intersection in flash. The controller shall also allow for all traffic signal controller software updates through the Application Programming Interface without removing the controller from operation or without placing the intersection in flash.

1.4 Intersection Control Software

The intersection control software should provide at a minimum, the functionality and operations specified in the NEMA TS-2 with NTCIP v02.06 Standard. All objects and functions available in the local control software should be named and defined according to the current NTCIP standard. Additional, non-required or manufacturer specific objects and functions should have a straight-forward, logical label and/or definition.

1.4.1 Basic Functionality

In addition to the aforementioned NEMA TS-2 Standard, the controller must satisfy the following additional requirements:

- 40 programmable phases
- 16 timing rings that can be configured by the user to run concurrently or independently
- 32 overlaps
- 20 unique phase sequences that can be programmed and operated by time of day. Each sequence should allow the user to specify specific phase order and sequence beyond basic phase pair reversal/switching
- 128 unique timing patterns, each with a unique:
 - o Cycle length, free, or flash command
 - o Phase split table
 - o Offset
 - o Phase or pedestrian recall or omit (per pattern)
- User can easily configure:
 - o Flashing Yellow Arrow functionality
 - o Pedestrian Overlaps
 - o Pedestrian advance or exclusive pedestrian intervals
 - o Trailing green sequences for compound intersections
 - o Preemption routines in accordance with the NEMA TS-2 specification (v02.06)
 - o HAWK Signals
- Detectors
 - o 10 detector tables selectable by TOD
 - o 72 detectors per detector table
 - o Ability to call multiple phases with one detector
 - o Ability to call overlaps directly
 - o Detector Diagnostics

-4-

REVISION OF SECTION 614 TRAFFIC SIGNAL CONTROLLER AND CABINET

- 16 Preempt Routines
 - o Return to Coord without transition
 - o Return to the longest waiting phase
 - o Return to the last phase skipped in sequence
- 10 Overlap tables selectable by TOD
- Transit Priority functionality
- Peer to Peer communications
 - o Allows for direct messaging between two controllers
 - o Allows user to send the status of ANY input/output function in the controller as well as phase intervals, preempt intervals, etc.
- 32 Customizable Alarms

1.4.2 User Interface

In addition to the front panel screen, the traffic signal controller shall have an on-board web server which hosts a graphical user interface for monitoring and configuring the intersection control software. The web server interface shall provide access from any internet enabled device with a web browser. No additional or proprietary software shall be needed to use the graphical user interface. The user interface shall include the following features and functionality:

- User Access Control: Local software shall allow for configuration of user groups to limit read/write permissions of individual controller programming and status menus to a set of users; permissions and user accounts shall be synced to all network connected controllers via included central-based profile server,
- Real-Time Signal Performance Analytics: The local controller web-server shall support graphical signal performance analytic tools such as a split monitor, a cycle length plot, phase termination diagrams, coordination diagrams, etc., without the need of a central signal system,
- On-Board Replay: Controller shall include a graphical based, on-board utility to replay recent operation to troubleshoot a failures. At a minimum, replay shall include ring timers, phase and overlap states, detector calls, channel status, etc. for the previous 3 minutes of operation,
- Change Tracking: Front panel or web-UI entered database changes shall be logged with the time/date stamp and username.

1.4.3 Input/output Configuration

The intersection control software should allow the user to dynamically configure and modify input and output pins on an individual, pin by pin basis. In addition, the user should be able to configure the signal output channels (phase/overlap to load-switch) so that any phase, overlap, or pedestrian output can drive any available load-switch in the traffic signal cabinet. The user shall perform such configurations and modifications from the controller front panel and also through the web user interface, without the need for additional configuration software or downloading additional files to the controller.

-5-

REVISION OF SECTION 614 TRAFFIC SIGNAL CONTROLLER AND CABINET

1.4.4 Master and Peer-to-Peer Communications

The signal controller shall be capable of operating in a closed loop network with other controllers as a master or slave controller without the need for additional software or licensing. The master unit must be able to perform the duties of a master controller in the closed loop network while simultaneously conducting traffic signal operations at the local intersection. The signal controllers within the network will communicate with other controllers via serial or Ethernet communications.

The Intersection Control Software shall support Peer-to-Peer functionality. Peer-to-Peer allows the controllers to send messages to other controllers connected in the same network via Ethernet communications.

1.4.5 Advanced User Programs (User Logic)

In addition to standard operations specified in the NEMA TS-2 for NTCIP v02.06 Standard, the intersection control software shall have a logic processor where the user can develop advanced logic statements and operations to be used as custom solutions or for feature development. In addition to standard Boolean logic, the user shall be able to specify conditions using all input and output functions including but not limited to phase indications and intervals, detector calls, preempt status, interval/service times, and greater than/less than relationships. For example, the processor shall provide a way for the user to program the following condition in the controller front panel: "Call preempt 5 if phase 2 is green for more than 25 seconds. Also send a message to the downstream controller to start preempt 2 in 15 seconds if the coordinator is currently in transition."

1.4.6 Database Management

The intersection control software and traffic signal controller shall be capable of storing multiple traffic signal databases (timing files) on the controller at any given time. The software should allow the user to save to or select from the list of stored databases on the controller from the front panel or web user interfaces. Databases shall be transferred between a personal computer and the traffic controller via an Ethernet connection using the web-user interface or using a standard FAT (or FAT-32) formatted USB flash drive using the controller front panel user interface. The software shall provide a user interface to select and save a database from the USB flash drive to the controller when multiple databases are located on the USB flash drive. The controller shall be able to switch between the current and stored databases at any time. The controller will set the selected database as "Active" at the end of the current sequence during an all-red condition timing less than 4 seconds.

1.4.7 Windows Based Controller Emulation Software

In addition to the above, one copy of a Windows based traffic signal controller emulation software package shall be supplied. This program would allow the user to program a traffic signal controller on a Windows based computer and shall be compatible with the latest version of the Windows operating system. The program supplied shall be the same version as the firmware version supplied with the controller. This program would allow the user to program a complete traffic signal controller and can be saved on a USB memory drive for transfer to a controller. This program shall be updated and supplied to the City at the same time as the Linux firmware for the controller and shall be supplied no charge for any updates.

-6-

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET**

1.4.7 Connected Vehicle Ready

Controller shall be CV Ready: “Time to Green” and associated confidence intervals must be supported via standard or manufacturer specific NTCIP objects and over XML protocol and included in manufacturer’s NTCIP MIBs.

Delete Subsection 614.08 (c) and replace with the following:

All new cabinets are the latest P-type cabinets as per the City & County of Denver Traffic Signal Standards. Each cabinet shall be installed on a newly installed traffic signal controller cabinet base unless otherwise specified on the plan.

Controller cabinet assemblies shall include an integrated uninterrupted power supply (UPS) units, an Ethernet Field Switch that comply with the City and County of Denver standards (see UPS and Ethernet Field Switch specifications).

The Controller Cabinet shall also include a malfunction management unit (MMU) that meets the following requirements:

- NEMA Standard TS2-2016 for MMU2 configuration will maintaining compatibility with the NEMA TS1-1989 assemblies.
- Flashing Yellow Arrow PPLT operation and meets / exceeds the NEMA Standard MMU2 requirements of TS2-2016 FYA, providing modes for both TS-2 or TS-1 cabinet configurations.
- Real-time SDLC communications with the Controller Unit exchanges field input status, Controller Unit output status, fault status, MMU programming, and time and date.
- A time-stamped nonvolatile event log records the complete intersection status as well as AC Line events, configuration changes, monitor resets, temperature and true RMS voltages.
- A Sequence History log stored in nonvolatile memory graphically display up to 30 seconds of signal status prior to each fault event.
- View the intersection signal status remotely with manufacturer provided software via the MMU Ethernet port.

Subsection 614.09 shall include the following:

The Contractor shall assemble the traffic signal controller, cabinet, and other auxiliary hardware in accordance with the City and County of Denver PW – Transportation Traffic Operations criteria, and program the traffic signal controller per the approved traffic signal timing work order. All traffic signal timing (controller programming) shall be bench tested with a minimum of 72-hours burn time to verify successful operation prior to installation. The Contractor shall coordinate all testing and installation procedures with the City and County of Denver’s PW Transportation – Traffic Operations staff. The Contractor shall contact Chris Lillie at (720) 865-4066 for all testing and installation requirements.

The controller shall be installed in accordance with the details shown in the plans and in accordance with manufacturer’s recommendations.

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET**

Subsection 614.10 shall include the following:

The Contractor shall demonstrate successful traffic signal operations at all new controller and cabinet locations to the satisfaction of the Engineer or Engineer's designee prior to acceptance of this item. The Contractor shall contact the Engineer or Engineer's designee 3 days before turning on signal. Work shall include all required programming of controllers and establishing or re-establishing all required wiring connections. Phasing and timing information at each location shall be furnished to the Contractor by the City & County of Denver.

All new wiring shall conform to City & County of Denver and International Municipal Signal Association (IMSA) specifications.

Subsection 614.13 shall include the following:

The unit price for the installation of traffic signal controller and cabinet shall include all labor, materials, ancillary hardware, traffic signal cabinet base, wiring and wiring re-connection (including Xcel Energy power feed) required to provide and install a complete system and successful operation of the item. Connection of the controller to the fiber optic interconnect system shall be paid for separately under item 614 "Telemetry (Field)".

Subsection 614.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Traffic Signal Controller and Cabinet	Each

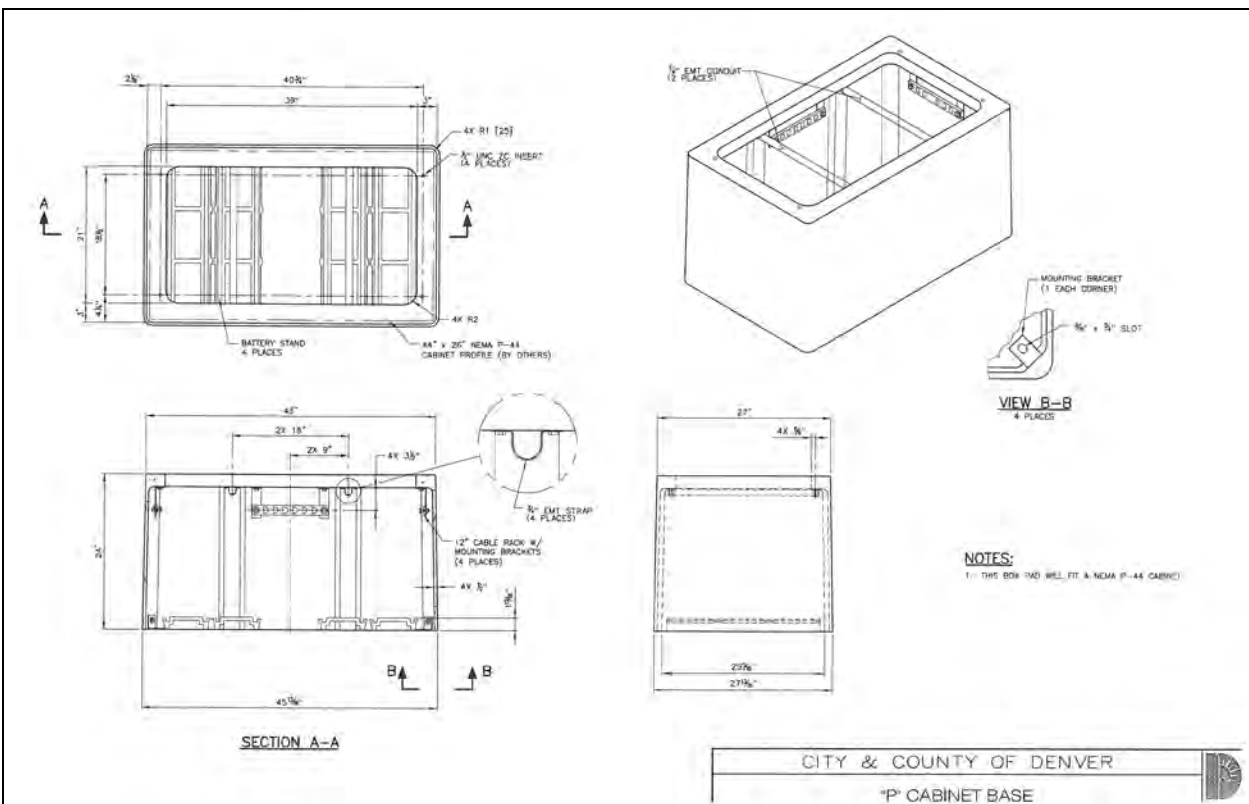
-1-
REVISION OF SECTION 614
TRAFFIC SIGNAL CABINET BASE

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work shall consist of furnishing and installing a Traffic Signal Controller Cabinet Base as shown on the plans and in accordance with the City & County of Denver standards. The Contractor shall furnish and install the base that will fit the City and County of Denver's P-size Traffic Signal Controller Cabinet at the location shown on the plans.

Dimensions of the cabinet base (City & County of Denver Traffic Engineering Services STD DWG NO. 16.1.16) are as shown in the following drawing:



Subsection 614.10 shall include the following:

Prior to starting cabinet base installation, the contractor shall obtain field verification of the location of the base from the Engineer or Engineer's designee.

Cabinet base installation shall include all labor and materials to completely install a new P-size cabinet base as directed in the plans. The item shall include all excavation, conduit installation and modification work, backfill and restoration of adjacent surface area.

-2-

**REVISION OF SECTION 614
TRAFFIC SIGNAL CABINET BASE**

Subsection 614.13 shall include the following:

Installation of the traffic signal cabinet base shall not be measured and paid for separately, but shall be included in the cost for installation of the Traffic Signal Controller and Cabinet.

Subsection 614.14 shall include the following:

Installation of the traffic signal cabinet base shall not be measured and paid for separately, but shall be included in the cost for installation of the Traffic Signal Controller and Cabinet.

-1-

**REVISION OF SECTION 614
EMERGENCY VEHICLE TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.08 shall include the following:

System Description:

The Emergency Vehicle Traffic Signal Priority Control System shall enable designated vehicles to remotely cause the traffic signal controller to advance to and/or hold a desired traffic signal display by using existing controller functions. The control shall be activated at a minimum distance of 548.6M (1,800 feet) along an unobstructed "line of sight" path. The control shall not terminate until the vehicle is within 12.2M (40 feet) of the detector or at the intersection.

The system shall consist of the following components:

- A. Vehicle Emitter which shall be mounted on the emergency vehicle and shall transmit optical energy signals only in the forward direction. If the municipality presently uses optical pre-emption, the emitters shall be of the same manufacture currently used by the City and County of Denver Fire Department.
- B. Phase Selector (minimum 2 channels) which shall cause the signal controller to advance to and/or hold the desired traffic signal display for the emergency vehicle. A pre-emption system chassis shall house two phase selectors.
- C. Optical Detector which shall be mounted on or near a traffic signal and shall receive the optical energy signals generated by the Vehicle Emitter.
 - a. Detector (Type A), 1 Direction, 1 Channel
 - b. Detector (Type B), 2 Direction, 1 Channel
 - c. Detector (Type C), 2 Direction, 2 Channel
- D. Detector Cable (Optical).

System Operations:

- A. The operating sequence shall be initiated when the optical detector receives the required optical energy signal from the Emitter.
- B. The phase selector shall cause the traffic signal controller to advance to and/or hold the desired traffic signal display for the emergency vehicle.
- C. The phase selector shall cause the controller to advance to and/or hold the desired traffic signal display even if the optical energy signals cease before the desired display is obtained.

-2-

**REVISION OF SECTION 614
EMERGENCY VEHICLE TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM**

- D. The phase selector shall allow the traffic signal controller to resume normal operation within ten seconds after optical energy signals cease if the optical energy signals cease after the desired traffic signal display is obtained.
- E. The phase selector shall not respond to optical energy signals from an emergency vehicle if it is already processing optical energy signals from another emergency vehicle.

System Components:

A. Vehicle Emitter:

The emitter assembly consists of an emitter and power supply and an emitter control switch assembly. The emitter assembly is mounted on a vehicle and produces a flashing optical signal when in operation. The following shall apply to the vehicle emitter:

1. Shall operate on ten to fifteen volts DC input voltage, but shall not be damaged by input voltage surges up to twenty-five volts DC.
2. Shall be controlled by a single on/off switch that requires no other adjustments by the operator. The on/off condition shall be indicated by a light located adjacent to the switch.
3. Shall be automatically disabled or de-activated by one or a combination of the following: seat switch, emergency brake switch, door switch, and transmission safety switch.
4. Shall operate over an ambient temperature range of minus 34^o C to plus 60^o C. (minus 30^o F. to plus 140^o F.)
5. Shall operate in 0 to 95 % humidity.
6. Shall be a pulsed optical energy source with a controlled repetition rate.
7. Shall not generate voltage transients on the battery input line which exceed battery voltage by more than four volts.
8. Shall produce optical energy in a cone of not more than 90 degrees horizontal and not more than 30 degrees vertical. The detectors and/or phase selector shall not sense a pre-emption signal from an emitter outside this cone.

B. Optical Detector:

The optical detector receives the high intensity optical pulses produced by the emitter. These optical energy pulses are transformed by the detector into appropriate electrical signals which are transmitted to the phase selector. The optical detector is mounted at or near the intersection in a location which permits an unobstructed line of sight to vehicular

-3-

REVISION OF SECTION 614
EMERGENCY VEHICLE TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM

approaches. The units may be mounted on signal span wires, mast arms or other appropriate structures. The following shall apply to the optical detector:

1. Shall produce optical energy in a cone of not more than 90 degrees horizontal and not more than 30 degrees vertical. The detectors and/or phase selector shall not sense a pre-emption signal from an emitter outside this cone.
2. Shall be of solid state construction.
3. Shall operate over an ambient temperature range of minus 34° C to plus 60° C. (minus 30° F. to plus 140° F.)
4. Shall have internal circuitry potted in a semi-flexible compound to ensure moisture resistance.
5. Shall operate in 0 to 95 % humidity.
6. Shall have a cone of detection of not more than 13 degrees. The detector and/or phase selector shall not sense a pre-emption signal from an emitter outside this cone.

C. Phase Selector:

The phase selector supplies power to and receives electrical signals from the optical detector. When detector signals are recognized as a valid call, the phase selector causes the signal controller to advance to and/or hold the desired traffic signal display. This is accomplished by activating the pre-empt input to the controller.

The phase selector is capable of assigning priority traffic movement to one of two channels on a first-come, first-serve basis. Each channel is connected to select a particular traffic movement from those normally available within the controller. Once a call is recognized, "commit to green" circuitry in the phase selector functions so that the desired green indication will be obtained even if optical communication is lost. After serving a priority traffic demand, the phase selector will release the controller to follow normal sequence operation. The following shall apply to the phase selector:

1. Shall include an internal power supply to supply power to the optical detectors.
2. Shall have minimum two-channel operation with the capability of interfacing with an additional phase selector for expansion of channels of operation.
3. Shall have adjustable detector range controls for each channel of operation, from 12M (40 feet) to 548M (1800 feet).
4. Shall have solid state indicator lights for power on and channel called.
5. Shall operate over an ambient temperature range of minus 34° C to plus 60° C (minus 30° F. to plus 140° F.)
6. Shall operate in 0 to 95 % humidity.

-4-

**REVISION OF SECTION 614
EMERGENCY VEHICLE TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM**

D. Detector Cable (Optical):

The following shall apply to the detector cable:

1. 3-Conductor cable with shield and ground wire.
2. AWG #20 (7x28) stranded.
3. Individually tinned copper strands.
4. Conductor insulation: 600 volt, 75 deg. C (167^o F.).
5. 1 Conductor-yellow; 1 Conductor-blue; 1 Conductor-orange.
6. Aluminized Mylar shield tape or equivalent.
7. AWG #20 (7x28) stranded uninsulated drain wire
8. DC resistance not to exceed 11.0 ohms per 305M (1000 feet).
9. Capacitance from one conductor to other two conductors and shield not to exceed 157pf/M (48pf /ft.).
10. Jacket: 600 volts, 80 deg. C (176^o F.), minimum average wall thickness - 1.14mm (.045").
11. Finished O.D.: 7.62mm (0.3") max.

System Interface:

System shall be capable of operating in a computerized traffic management system when appropriate interfacing is provided by the computer supplier.

General:

The Contractor shall furnish the manufacturer the phasing diagrams indicating controller sequence and timing.

The Contractor shall secure from the manufacturer a guarantee for the equipment for a period of sixty (60) months, which time shall commence from the date of delivery. Manufacturer shall certify upon request that all materials furnished will conform to this specification. The manufacturer or his designated representative shall be responsible for determining and setting all required range and emitter intensity for the emergency vehicle operation.

Construction Methods:

All equipment except the vehicle emitter assembly shall be installed and wired in a neat and orderly manner in conformance with the manufacturers' instructions. The vehicle emitter assembly shall be delivered to a designated City representative.

Installation of the vehicle emitter assembly shall be the responsibility of the City and County of Denver Fire Department.

Traffic signals owned and maintained by the State that have optical pre-emption equipment owned and maintained by the town shall have an Auxiliary Equipment Cabinet (AEC) attached to the controller cabinet. The optical pre-emption equipment shall be housed in the AEC. Traffic signals owned and maintained by the town do not require an AEC to house the pre-emption equipment.

Detector cables shall be continuous with no splices between the optical detector and the AEC.

-5-

**REVISION OF SECTION 614
EMERGENCY VEHICLE TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM**

Detector locations shown on the plan are for illustration purposes only. Exact location shall be determined by the contractor or the designated representative for the best possible line of sight.

If not present in an existing traffic controller cabinet, the following items shall be installed and connected, in conformance with the current Functional Specifications for Traffic Control Equipment, "D" Cabinet Requirements (Pre-emption Type):

- Controller "D" harness and adapter.
- Pre-emption termination panel with terminal block and relay bases.
- Pre-emption disconnect switch, mounted on the emergency switch panel (on inside of cabinet door).
- Pre-emption test buttons, mounted on the pre-emption termination panel.

All connections from the phase selector to the "D" harness and to the cabinet wiring shall be made at the termination panel. The termination panel shall have AC+ Lights, AC-, and a switched logic ground. The switched logic ground feeds all the pre-empt inputs to the phase selector. When switched off by the pre-emption disconnect switch, the traffic controller shall not be affected by pre-empt calls from the optical pre-emption system. A minimum of two test buttons shall be provided. If there are more than two pre-empt runs, a button for each shall be installed. A chart or print out indicating the program steps and settings shall be provided along with the revised cabinet wiring diagrams.

Test the Pre-emption System According to the following Guidelines:

1. Notify the system owner/user, such as the Municipal Fire Chief or City Traffic Engineer, of the scheduled inspection.
2. Request a fire department representative and an emergency vehicle, which has an emitter to conduct the test. If not available, the contractor shall provide an emitter.
3. In the presence of the Engineer and the municipal representative, test each pre-empted approach with the emergency vehicle. Test the following items of the system:
 1. Confirm that the emitter activates the phase selector and the phase selector activates the correct pre-emption input to the controller.
 2. Confirm adequate range. The traffic signal must be pre-empted to green sufficiently in advance of the emergency vehicle arrival. The vehicle emitter shall initiate pre-emption at a minimum distance of 548.6M (1800 feet).
 3. Confirm there are no false calls. Keep the emitter active as the emergency vehicle passes through the intersection. No other optical detectors shall sense the strobe.
 4. Document the test. Provide the Engineer and, upon request, the municipality copies of the test results.

-6-

**REVISION OF SECTION 614
EMERGENCY VEHICLE TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM**

If a malfunction is found or the system needs adjustment (such as range, emitter intensity, or detector location), schedule a follow-up test. Repeat the above steps for all approaches that did not pass.

All adjustments such as emitter intensity, phase selector range, sensitivity, detector placement, shall be made at the intersection by the contractor so that the optical pre-emption operates correctly with other major manufacturers' equipment currently owned by the town.

Subsection 614.13 shall include the following:

The Emergency Vehicle Traffic Signal Priority Control System shall include a four-channel card and the number of detectors as shown on the plans. Emergency Vehicle Traffic Signal Priority Control System shall be measured and paid by the number of intersections at which the system is installed. The item shall include all labor, materials, and ancillary hardware required to provide a fully functioning system to the satisfaction of the Engineer. The Emergency Vehicle Traffic Signal Priority Control System will be quantified and paid for as the Fire Preemption Unit and Timer bid item.

Subsection 614.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Fire Preemption Unit and Timer	Each

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (FLIR)(CAMERA)**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work is for the installation of a fully-functional FLIR vehicle detection camera system. The Contractor shall furnish and install the FLIR vehicle detection camera system at the locations as shown in the plans or as directed by the Engineer.

Subsection 614.08 shall include the following:

1 Detection Camera

The detection camera shall consist of a thermal camera, thermal lens, and enclosure; and shall meet the following specifications:

1.1 Thermal Camera & Lens

The detection camera shall be a 320 x 240 (minimum) and 10 frames per second (minimum) thermal camera that fits into the camera enclosure specified herein. The lens shall be a fixed thermal lens. Digital zooming is allowed.

1.2 Camera Enclosure

The camera enclosure shall consist of a dustproof and waterproof outdoor camera housing designed specifically to fit the thermal camera and thermal lens specified herein. The enclosure shall have a sun shield to prevent direct and indirect sunlight entering the lens. A thermostatically controlled heater for window defogging and defrosting is allowed.

1.3 Power

The detection camera shall be powered by a 120/240VAC, 50/60Hz power source or by a 24VDC ($\pm 10\%$) power source.

1.4 Reliability

The interface card shall be designed and manufactured to have a MTBF (Mean Time Between Failure) prediction figure of greater than or equal to 10 years continuous operation.

1.5 Certifications & Environmental

The detection camera shall meet the following Certifications and Environmental specifications:

Certifications	Comply with Electromagnetic Compatibility - 2004/108/EG Comply with FCC Part 15, Class A
Weatherproof	IP66 ingress protection standards (minimum)
Operating Temperature	-34°C to +74°C (-29°F to +165°F) (minimum)
Relative Humidity	Up to 100% non-condensing
Shock & vibration	NEMA II

1.6 Mounting Brackets

A versatile mounting bracket shall be supplied to mount the camera enclosure, specified herein, to a horizontal luminaire or vertical traffic signal pole.

-2-

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (FLIR)(CAMERA)**

All mounts shall be secured with stainless steel mounting straps or bolts. The mounts, including the mass and size of the detection camera, shall be designed to withstand a wind load of 120km/h (or 75mph) with a 30-second gust factor.

1.7 Camera to Controller Cabinet Cable

Cable needed to power the detection camera specified herein, transmit thermal video and data information to the controller cabinet shall be provided and meet the specifications of the thermal video imaging detection system manufacturer.

2 Thermal Video Processor

A thermal video processor shall be included in the detection camera, specified herein, or in the interface card, specified herein; and shall meet the following specifications:

2.1 Functionality

The thermal video processor shall provide the following functionality:

Detector Display	Capable of displaying bike detection regions on the thermal video image with associated outputs with output status shown on the screen
Detector Placement	By using a portable PC with graphical user interface software or web server
Detector Function	Capable of detecting within the view of the connected detection camera the presence of bicycles in user defined bicycle detection regions
Detector Type	Configurable as presence, count, delay, extension, or pulse mode of either arrival or departure of bicycles. The detector shall be capable of detecting pedestrians and small motorcycles too.
Detector Modification	All detectors and parameters shall be able to be changed without interrupting detection. When one detector is modified, all existing detectors shall continue to operate, including the one that is being modified. When the new detector position is confirmed, the new detector shall have no learning phase and shall be operating while the one being modified ceases to operate
Detector Failure State	Provide a constant call on each active detection channel, in the event of unacceptable interference or loss of the thermal video signal
Regions per Video Output	Up to 4 (minimum)
Detector Delay & Extension	Defined between 0.1-99 seconds and pulse mode between 0-500ms in 10ms increments.
Direction Sensitivity	Able to make a detector directional sensitive

-3-

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (FLIR)(CAMERA)**

3 Camera Interface/Surge Suppression Panel

When the thermal video processor is in the detection camera, a UV resistant signal cable with 3 wires (maximum) of wire diameter AWG18 (minimum) shall be provided to power the detection camera, transmits detection information to the interface card specified herein, and provides remote communication specified herein. The cable distance between detection camera and interface card is 300m or 1,000ft (minimum).

When the thermal video processor is in the interface card with coax thermal video cables being used between the detection camera and the interface card, a surge suppression panel shall be provided that powers the detection camera with high-voltage transient protection and power isolation, and suppresses electrical spikes on the thermal video coax cable.

The camera interface/surge suppression panel shall meet the following specifications:

3.1 Certifications and Environmental

The interface card shall meet the following Certifications and Environmental specifications:

Certifications	Comply with Electromagnetic Compatibility - 2004/108/EG Comply with FCC Part 15, Class A
Operating Temperature	-34°C to +74°C (-29°F to +165°F) (minimum)
Relative Humidity	0-95% non-condensing (minimum)
Shock & vibration	NEMA II

4 Interface Card

Input/output main and expansion cards shall be supplied that are designed to convert real-time detection signals from the video processor, specified herein, into contact closure signals to the traffic light controller; and to relay traffic signal phase status to the video processor, specified herein. The interface card shall meet the following specifications:

4.1 Functionality

The interface card shall provide the following functionality:

Cabinet/Controller Compatibility	US: EDGE card for TS-1 cabinet and 2070 TS-1 and TS-2 controllers Rest of World: EURO card for various standard controllers
Status Indicators	Visual for state of each detection output, visual state of power status (ON/OFF), visual state of camera status (operational/not operational)
Identification	Individually addressable with serial number, MAC address, IP-address, subnet mask and default gateway
Program Retention	Continue to operate in accordance with previous program after recovering from communication system or power failure
Time Synchronization	Manually or NTP time source

-4-

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (FLIR)(CAMERA)**

4.2 Communication

The interface card shall meet the following specifications:

Controller Interface Output	Contact closure via interface backplane, providing up to four channels of vehicle detection with no front panel connectors being used
ETHERNET	RJ45 port for hard-wired system set-up and monitoring
USB	USB 2.0 (minimum) on front panel for connecting a USB dongle to allow wireless set-up and monitoring via portable PC, tablet and/or smart phone

4.3 Remote Communications

Remote communications to allow remote management specified herein shall be provided via the interface card and shall meet the following specifications:

4.3.1 Functionality

Remote communications shall provide the following functionality:

Cabinet/Controller Compatibility	US: TS-1 cabinet and 2070 TS-1 and TS-2 controllers Rest of World: EURO card for various standard controllers
Thermal Video Compression	MJPEG, MPEG-4 (ISO 14496-2) and/or H.264 (ISO/IEC MPEG-4 AVC)
Thermal Video Frame Rate	Constant and variable 10 frames per second (minimum)
Thermal Video Bandwidth	Between 32 kbps and 4 Mbps (minimum)
Status Indicators Identification	Ethernet link/activity Individually addressable with serial number, MAC address, IP-address, subnet mask and default gateway
Program Retention	Continue to operate in accordance with previous program after recovering from communication system or power failure

4.3.2 Communication

The remote communications shall meet the following specifications:

Ethernet Port	One 10/100Base-T front-panel RJ45 port (minimum)
Thermal Video Input	Via front panel connector

4.4 Power

The interface card shall meet the following power specifications:

Input Voltage	24VDC \pm 10% (via cabinet detector rack backplane)
Power Consumption	10W (maximum)

-5-

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (FLIR)(CAMERA)**

4.5 Physical Properties

The interface card shall meet the following physical properties specifications:

Size	US: Fits directly into NEMA TS-1 cabinet detector rack or fits on DIN-rail Rest of world: Fits directly in EURO half/full 19" rack or fits on DIN-rail
-------------	---

4.6 Reliability

The interface card shall be designed and manufactured to have a MTBF (Mean Time Between Failure) prediction figure of greater than or equal to 10 years continuous operation.

4.7 Certifications and Environmental

The input/output main and expansion cards shall meet the following Certifications and Environmental specifications:

Certifications	Comply with FCC Part; 15 NEMA TS 2-2003 v02.06
Operating Temperature	-37°C to 74°C (-35°F to 165°F) (minimum)
Humidity	0 – 95% non-condensing

5 Remote Management System

Remote management system shall be provided to monitor, control, and troubleshoot the thermal video imaging detection devices remotely via the Ethernet communication system. The vendor shall provide all software that will be loaded and configured by staff on furnished server hardware that is connected to the thermal video imaging detection devices via the Ethernet communication system. Remote management shall meet the following minimum requirements:

5.1 Diagnostic & Health Monitoring

Management Status	Provide real-time status display of services required to access, troubleshoot, and archive data from the thermal video imaging detection system network connected devices
Network Device View	Provide view of all thermal video imaging detection system network connected devices
Operation Log	Support retrieving, displaying, and saving operational messages, warnings, and errors

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (FLIR)(CAMERA)**

5.2 Remote Management & Maintenance

Video Viewing/Recording	Support viewing and recording streaming video including detector overlay
Device Management	Support creating, editing, downloading, and uploading detector configurations
Remote Firmware Updates	Support updating firmware of any device from a remote location
Remote Backup/Restore	Support backup/restore device configuration from remote location
Access Permissions	Support password implementation
Clock Synchronization	Support the Network Time Protocol (NTP) to synchronize the internal clocks of the thermal video imaging detection system network connected devices a minimum of once a day

Subsection 614.10 shall include the following:

Intersection Detection System (FLIR) (Camera) shall be installed per manufacturer requirements and recommendations.

Subsection 614.13 shall include the following:

Intersection Detection System (FLIR) (Camera) shall be measured and paid by the number of cameras installed at each intersection. The item shall include all labor, materials, and ancillary hardware required to provide a fully-functional system to the satisfaction of the Engineer.

Subsection 614.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Intersection Detection System (FLIR) (Camera)	Each

-1-

**REVISION OF SECTION 614
TRAFFIC SIGNAL POLES – GENERAL**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.08 (g) shall include the following:

This work is for the installation of the mast arm traffic signal poles and traffic signal light pole (no mast arm). The Contractor shall furnish and install the traffic signal poles and mast arms at locations as shown on the plans. The Contractor shall store and protect the poles and mast arms in the Contractor's yard upon delivery. The Contractor shall transport the poles and mast arms to the job site for installation. All traffic signal poles shall be painted dark olive green in conformance with Federal Specification No. 14056.

The mast arm traffic signal poles and the traffic signal light poles (no mast arms) will be the type manufactured by Valmont in accordance with the latest City and County of Denver's Traffic Standards and Specifications.

General specifications of the, mast arm traffic signal poles and traffic signal light poles (no mast arms) are as follows:

TRAFFIC SIGNAL POLES: All traffic signal poles (mast arm traffic signal poles, traffic signal light poles - no mast arms) shall conform to latest City and County of Denver's Traffic Standard Details 16.1.3 and 16.1.9 to 16.1.12.

The Contractor shall also furnish and install a 5300 Lumens LED luminaire at all traffic signal poles as shown on the plans or as directed by the Engineer. The LED luminaire shall be in accordance with the City and County of Denver's specifications and Sections 613 - LIGHTING (LUMINAIRE)(LED 5300 LUMENS). The luminaire shall be installed on the traffic signal poles with a 10-foot luminaire arm as per the City and County of Denver's Traffic Standard Details 16.1.3, and 16.1.9 to 16.1.12.

FINISH: All traffic signal poles and mast arms shall be finish in accordance with the Valmont F540 finish process or equal (hot dipped galvanized, epoxy primer and powder coated).

PAINTING: All traffic signal mast arm poles shall be powder coated in accordance with the following specifications:

General:

Super Durable Powder Coating: The super durable powder coating shall consist of a Urethane or Triglycidylisocyanurate (TGIC) Polyester Powder, and provide a minimum of 3 times the gloss retention, color retention and ultraviolet light (UV) resistance as standard powder coatings. Color shall be dark olive green, in conformance with Federal Specification No. 14056.

Surface Preparation:

The exterior steel surface shall be blast cleaned to Steel Structures Painting Council Surface Preparation Specification No. 6 (SSPC-SP6) requirements utilizing cast steel abrasives conforming to the Society of Automotive Engineers (SAE) Recommended Practice J827. The blast method is a recirculating, closed cycle centrifugal wheel system with abrasive conforming to SAE Shot Number S280.

-2-

**REVISION OF SECTION 614
TRAFFIC SIGNAL POLES – GENERAL**

Interior Color:

Interior surfaces (pole shafts only) at the base end for a length of approximately 2.0' shall be mechanically cleaned and coated with a zinc rich epoxy powder. The coating shall be electrostatically applied and cured in a gas fired convection oven by heating the steel substrate to a minimum of 350 degrees Fahrenheit and a maximum of 400 degrees Fahrenheit.

Exterior Coating:

All exterior surfaces shall be coated with Urethane or Triglycidylisocyanurate (TGIC) Polyester Powder to a minimum film thickness of 2.0 mils (0.002"). The coating shall be electrostatically applied and cured in a gas fired convection oven by heating the steel substrate to a minimum of 350 degrees Fahrenheit and a maximum of 400 degrees Fahrenheit. The thermosetting powder resin shall provide both intercoat as well as substrate fusion adhesion that meets 5A or 5B classifications of ASTM D3359.

Packaging:

Prior to shipment, small poles shall be wrapped in 0.188" thick Ultraviolet inhibiting plastic backed foam. Larger poles shall be cradled in a 1.0" rubberized foam base.

Handling and Shipment:

Poles shall be handled in a manner that will preserve the overall appearance and prevent damage to the coating. The use of chains or cables for loading, unloading, or installing is prohibited. Only ¾ inch diameter or larger nonabrasive nylon rope or equivalent nylon belting will be used. Adequate hold-downs and appropriate blocking shall be utilized for shipping to prevent load movement and damage to the outer coating in transit. No handling should be allowed until "dry through" condition has been achieved with the coating.

Extra care will be taken not to damage the coating. Upon arrival of the poles at the delivery point, neither chains nor cables will be used for either unloading or installation of poles.

Procedure for Field Touch-Up:

The pole manufacturer will furnish extra paint, both primer and color coat, to satisfy the needs of field touch-up requirements, in the event of minor physical damage to the coating from handling or transit. Damaged area must be clean and dry before repair application. Field touch-up will be at the direction of the pole manufacturer or their authorized representative.

Subsection 614.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Traffic Signal-Light Pole Steel	Each
Traffic Signal-Light Pole Steel (1-20 Foot Mast Arm)	Each
Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm)	Each

-1-

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

Section 614 of the Standard Specifications is hereby revised for this project as follows.

Subsection 614.01 shall include the following:

This work consists of fan-out and termination of fiber optic (interconnect) cable at each controller cabinet location as identified in the plans. This work also includes providing and installing all necessary telemetry equipment including but not limited to optical splice closures, field patch panels, splice organizers, cables, pigtails/jumpers and labels.

Color-coded fibers and buffer tubes shall be used throughout the entire project. At the terminal points the jackets shall be stripped and the ends taped. Gel filled compound shall be removed using filled cable cleaner.

At every cabinet or optical closure, only the fibers identified in the plans to be spliced and/or connected to a patch panel or other internal device are required to be landed. All cut and unconnected fibers shall be sealed in a manner recommended by the fiber optic cable manufacturer and coiled neatly in a splice organizer.

The same color-coded pairs of fibers and/or wires shall be used throughout the entire project unless shown as otherwise in the plans. Gel filling compound shall be removed using filled cable cleaner.

Subsection 614.08 shall include the following:

Fiber Optic Patch Pigtail:

The fiber optic pigtail cables shall consist of MM fibers housed individually in protective jackets. Both ends of the cable shall be connected. Fiber optic patch cord cable shall be suitable for operation over a temperature range of -30 degrees to +60 degrees Celsius. Fiber optic patch cord cables shall be of length suitably long to be connected between the interconnect panel and the communications equipment (i.e. fiber optic transceivers). Patch cord couplings shall be compatible with termination points. Appropriate strain relief in the cabinet (through cable ties) shall be installed at a minimum of three locations. Sufficient slack shall be left to allow relocation of the equipment anywhere in the cabinet. The attenuation of a fiber optic patch cord cable after installation, not including the connector loss, shall not exceed 0.1 dB measured at 850 nm and 1300 nm.

Connectors:

The connector shall have a ceramic ferrule with a nickel-plated nut and body. The connector shall be an AT&T ST style compatible field mounted connector. The connector shall be compatible with a physical contact (PC) finish. All connectors shall be polished to a PC finish such that the return loss per mated pair of connectors is less than -25 dB. The return loss when the connector is mated with previously installed connectors shall be less than -18 dB.

-2-

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

The connector insertion loss shall not be greater than 0.20 dB (typical). The connector loss shall not vary more than 0.20 dB after 1000 repeated matings. Tensile strength shall withstand an axial load of 20 lb. with less than 0.20 dB change.

Index matching fluids or gels shall not be used. The connectors shall be compatible with the optical fiber surrounding jacket and shall be installed on one end of the optical fiber in accordance with the manufacturer's recommended materials, equipment and practices. The connector shall be suitable for the intended environment and shall meet the following environmental conditions:

Operating Temperature: -40° to +80° C
Storage Temperature: -40° to +85° C

The connector loss shall not vary more than 0.20 dB over the operating temperature range. Connectors shall be protected by a suitably installed waterproof protection cap.

Miscellaneous Cabling:

Fiber optic patch cords shall be fiber optic jumper cable, duplex, ceramic ferrule, MM 62.5 nm, adaptable to AT&T ST style connectors, 2 meters in length, ITT Canon Model 161001-4020 or approved equal. Cable from fiber optic modem to Port 3 controller harness shall be 25-pin cable Model 44982G4 or approved equal. The Contractor shall deliver transceivers to the City's Traffic Signal Shop. Contact Joe Strauss (720) 865-4062 for coordination.

Optical Splice Closures:

Coyote Runt or Coyote Pup Type closures shall be provided for splicing lateral fiber optic cables to the main (backbone) fiber cable in all pull box locations that are identified in the plans. All closures shall include 1-Inch future port kit (part no. 8003408, Pre-Formed Line Products). The Coyote Runt Closure shall be used at locations with 3 fiber optic cables. In locations requiring more than 3 cables, a Coyote Pup Closure shall be installed.

Subsection 614.13 shall include the following:

Telemetry (Field) shall be measured by the total number of cabinets at which the interconnect cable is fanned out, terminated, connected, patch panels and fiber-optic interfaces installed. All labor and materials required to perform panel installations, provide in-cabinet strain relief, fan-out, cable termination and connection to the controller is considered included in the unit price for this item.

-3-

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

This item, therefore, includes the following:

1. All required in-cabinet cable ties and strain relief (including ancillary hardware and labor to complete);
2. All required fan-out kits, kit tools, ancillary hardware and labor to accomplish the fan-out at the cabinet;
3. All required pigtails and harness cables;
4. All required interconnect centers and fiber optic interface panels in individual controller cabinets as shown in the plans;
 - All required termination enclosures (including specified features), connectors, adapters, jumpers, pigtails, patch cord cables, ancillary hardware and labor required to accomplish the cabinet termination;
 - All required optical splice closures;
 - All other labor and material necessary to complete the item

All labor and materials necessary to complete this item shall be considered included in the unit price and will not be paid separately.

Subsection 614.14 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Telemetry (Field)	Each

-1-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.08 shall include the following:

1.1 SUMMARY

- A. **Scope:** This specification describes the operation and functionality of a continuous duty, single-phase Uninterruptible Power Supply unit, hereafter referred to as the UPS.
- B. **Included Features of the UPS:**
1. The UPS utilizes double conversion online topology designed to protect electronic equipment by supplying reliable, clean power featuring extremely tight voltage and frequency regulation.
 2. Wide operating temperature range -40C to 74C.
 3. Field replaceable air filter.
 4. Field replaceable fan assembly.
 5. The UPS features internal bypass and input power factor correction.
 6. The primary sections of the UPS are: input disconnect and filter stage, input PFC power stage, energy storage stage (DC bus capacitor bank), output power (inverter) stage, bypass and a bidirectional DC-DC converter / battery charger. The control of power module and fault detection logic is microcontroller-based.
 - a. The input disconnect and filter stage contains an input back-feed relay, input filter and transient suppression.
 - b. The input PFC power stage contains non-isolated power factor correcting AC/DC converters. This converter is capable of full power operation over a very wide input voltage range.
 - c. The energy storage stage is a split DC bus capacitor handling seamless transitions from battery to line and vice versa, as well as the low and high frequency power stages.
 - d. The output power stage operates directly from the DC bus and develops an output of 120V AC ,60Hz. The AC output of the inverter is connected to bypass relay. The bypass relay output is routed to the output terminals of the UPS.
 - e. The UPS contains a battery charger, which operates from the DC bus. The UPS can be restarted immediately after a prolonged power outage without waiting for the battery to be recharged.
 7. The UPS provides early-warning fault analysis on batteries and will project battery replacement dates, enabling timely preventive maintenance.
 8. The UPS has flash memory to facilitate firmware upgrades.
 9. The graphical LCD display with multicolor backlight provides detailed information, with the ability to configure the display locally.
 10. An integrated Network Management Card 2 (reference APC part # AP9537SUM-FC) with Environmental Monitoring is embedded into the UPS.
- C. **Performance, Design, and Configurations:** The UPS and associated equipment operates in conjunction with a primary power supply and an output distribution system to provide quality uninterrupted power for mission-critical, electronic equipment and other load devices.

-2-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

1. This specification describes the performance, functionality, and design of the UPS, the external Battery Systems, and connectivity solutions.
2. All programming and miscellaneous components for a fully operational system as described in this section are available as part of the UPS.
3. The UPS and battery packs are available in the following configurations:

TYPE	MODEL	SKU
UPS	APC SECUREUPS 1300VA / 1300W, 120VAC IN/OUT RM CONFORMAL COATED	XU1K3LLXXRCC
Accessories	APC SECUREUPS BATTERY HARNESS SBS75 CABINET ACCESORY 8FT	XHHXS7A8F
	APC SECUREUPS BATTERY HARNESS SBS75 CABINET ACCESORY 4FT	XHXXS7A4F
	APC SECUREUPS BATTERY HEATER MAT 256 SQ IN 115/120VAC SINGLE PHASE IN CABINET ACCESSORY	XM050DXXXXA
	APC SECUREUPS BATTERY HEATER MAT 365 SQ IN 115/120VAC SINGLE PHASE IN CABINET ACCESSORY	XM102DXXXXA
	APC SECUREUPS BATTERY 50AH 12VDC EXTENDED TEMPERATURE SHELF MOUNT	XB050XX1XS
	APC SECUREUPS BATTERY 100AH 12VDC EXTENDED TEMPERATURE SHELF MOUNT	XB102XX1XS

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

1.2 REFERENCES

- A. **General:** The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications is the latest date as of the date of the Contract Documents, unless otherwise specified.

- B. **Institute of Electrical and Electronics Engineers, Inc. (IEEE):**
 - 1. ANSI/IEEE 519, "Guide for Harmonic Control and Reactive Compensation of Static Power Converters" (copyrighted by IEEE, ANSI approved).

- C. **International Organization for Standardization (ISO):**
 - 1. ISO 9001, "Quality Management Systems - Requirements."
 - 2. ISO 14001, "Environmental Management Systems - Requirements with Guidance for Use."

1.3 STANDARDS

A. **Regulatory Compliance:**

Model Description	SKU	Approvals
APC SECUREUPS 1300VA / 1300W, 120VAC IN/OUT RM CONFORMAL COATED	XU1K3LLXXRCC	UL, cUL/CSA UL-1778 (CSA 107.3 for Canada), IEC62040-2 2005 Edition and FCC Part 15 Class A,

-4-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

1.4 SYSTEM DESCRIPTION

A. Mechanical Design

1. The UPS is contained in a Powder coated steel chassis with plastic display panel embedded into the chassis.
2. The UPS has a field replaceable filter and fan assembly.
3. The chassis weights and dimensions are:

Description	SKU	Weight kg (lb)	Height mm (in)	Width mm (in)	Depth mm (in)
APC SECUREUPS 1300VA / 1300W, 120VAC IN/OUT RM CONFORMAL COATED	XU1K3LLXXRCC	10.0 (22.0)	88 (3.46)	432 (17.0)	260 (10.2)

B. System Characteristics

1. **General:**
 - a. **Power Rating:** 1300VA/1300W
 - b. **Output power factor :** 1
 - c. **Charger Power:** 750 Watts
 - d. **Topology:** Double Conversion On-Line
 - e. **Cooling:** Fan cooled
2. **Online Efficiency:** The UPS efficiency stated here is at full load and without degradation of output regulation as specified. Efficiency is 89% at rated load.
3. **Input:**
 - a. **AC Input Nominal Voltage:** 120 V.
 - b. **AC Input Voltage Window:**
 - 1) Full Load, 85-155 V +/- 2V, 5 V hysteresis.
 - c. **Input Frequency Range:** 40 – 70 Hz, auto-selecting.
 - d. **Online Input Power Factor:** 0.95% for Full Charger power Load and > 75% Loads.
 - e. **Input Current Distortion:** <5% for 100% load.
 - f. **Input Circuit Breaker (UPS):** 30A UL Listed
 - g. **Input Surge Protection:** 432 Joules.

-5-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

- 4. UPS Output:**
- a. **Nominal Output Voltage:** 120 V
 - b. **Output Connector:** Terminal Block - Hardwire
 - c. **Output Frequency:** 50/60 +/- 3Hz (auto-sense); 50/60 +/- 0.1 Hz (user-selectable).
 - d. **Output Frequency Regulation:** Free Running: Nominal +/- 0.1 Hz.
 - e. **AC output voltage distortion:**
 - 1) 5% @ 100% full linear load; 10% @ 100% full non-linear load.
 - f. **AC output static voltage regulation:** ± 1%.
 - g. **AC output dynamic voltage regulation:** ± 5% rms in 2cycles for 10% to 90% resistive load step of the initial value.
 - h. **Output Voltage Harmonic Distortion:**
 - 1) <5% THD for a 100% linear load.
 - 2) <10% THD for a 100% non-linear load.
 - i. **Overload Rating: % and duration**
 - 1) Normal Operation (Online):
 - a) 120Vac: 105% No Limit; 125% for 1min, 150% for 30 seconds and >175% on AC for 500mSec.
 - 2) **Bypass Operation:** Overload is limited by the internal 30A input circuit breaker feeding the UPS:
 - a) Bypass is internal
 - b) Voltage range: 120Vac 86-148Vac,.
 - c) Frequency range: 47-53 Hz or 57-63 Hz based on bypass frequency setting.
 - d) Transfer time: To Bypass mode – 15ms max.
 - e) Transfer time: Bypass to Online mode – 15ms max.
 - f) Bypass can be commanded through the diagnostic menu
 - j. **Derating over temperature:** Supports 100% load at 65 °C, Linearly de rate to 70% load at 74 °C.
 - k. **Output Load Power Factor Rating:**
 - 1) 0.7 lagging to 0.7 leading.
 - l. **Crest Factor:** 3:1.
- 5. Charger:**
- a. **Nominal Battery Voltage:** 48 V.
 - b. **Charger capacity:** 850W Max, 15A Max, whichever is applicable.
 - c. **Runtime at 100% load:** >2 hours for 100Ah battery.
- 6. Battery: Not supplied with UPS sold as an accessory, user must select the rating of the battery AH though the UPS user interface.**
- Battery Types available:** Sealed maintenance free valve regulated lead acid battery (VRLA) with suspended electrolyte, leak proof:
- 1) 100 Ah qty 4 required for 48 Vdc battery system
 - 2) 50 Ah qty 4 required for 48 Vdc battery system

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

1.5 SUBMITTALS

A. Proposal Submittals:

1. Product catalog sheets or brochures.
2. Product guide specifications.
3. Product technical specifications.
4. System package submittal drawings including a single-line and mechanical diagrams.

B. Delivery Submittals:

1. User Manual: which includes safety information, specifications, UPS features, configuration, UPS settings and troubleshooting information, accessories details, installation details, and start-up of UPS.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements:** The UPS is designed to be installed inside an Intelligent Traffic System cabinet i.e. NEMA, Caltrans etc. The cabinet should be weather proof and have particulate filtering in lieu of the filtering provided by the UPS. The UPS should be kept dry as possible if being serviced in wet weather.
1. The UPS is capable of withstanding any combination of the following environmental conditions in which it must operate without mechanical or electrical damage, or without a need for de-rating of the output Power.
 - a. **Storage Ambient Temperature:** -45 to 85°C UPS only (without batteries)
 - b. **Operating Ambient Temperature:** -40°C to 74°C (LCD display -20 to 70°C)
 - c. **Relative Humidity:** 0% to 95% non-condensing.
 - d. **Altitude:**
 - 1) Storage Altitude: 0 to 50,000 feet (0 to 15,000 meters) above sea level
 - 2) Operating Altitude: 0 to 10,000 feet (0 to 3000 meters) above sea level. At altitude of 10,000 feet the UPS must be loaded only up to 90% of its nominal capacity.
 - e. **Audible Noise:**
 - 1) <55 dBA at 100% load at 3 ft (1 m).
 - f. **Protection Class:** IP 20.

1.7 WARRANTY

- A. Limited Warranty:** Schneider Electric IT Corporation (SEIT) warrants the UPS to be free from defects in materials and workmanship for a period of 3 years from the date of purchase,
1. **Warranty Limitations:**
 - a. The obligation of Schneider Electric IT Corporation (SEIT) under this warranty is limited to repairing or replacing, at its own sole option, any defective product.
 - b. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way.
 - c. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.

-7-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

- d. EXCEPT AS PROVIDED HEREIN, Schneider Electric IT Corporation (SEIT) MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.
 - e. EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL Schneider Electric IT Corporation (SEIT) BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, Schneider Electric IT Corporation (SEIT) is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.
 - f. This warranty gives you specific legal rights and you may have other rights that vary from state to state.
2. **Warranty Procedures:**
- a. To obtain service under warranty the purchaser must obtain a Returned Material Authorization (RMA) number from customer support.
 - b. Products must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Basis of Design:** Products specified is SECUREUPS Uninterruptible Power Supply Unit as manufactured by APC by Schneider Electric and as listed on page 2 of this specification. Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by other manufacturers are acceptable. The Architect/Engineer will be the sole judge of the basis of what is equivalent.

2.2 MODES OF OPERATION

- A. **Normal:** The UPS output power stage (inverter) constantly recreates the UPS output AC voltage waveform by converting the DC bus voltage to AC voltage through a set of IGBT switches. In both online operation and battery operation, the output power stage (inverter) creates an output voltage waveform independent of the mains input voltage waveform. Input voltage anomalies such as brown-outs, spikes, surges, sags, and outages do not affect the amplitude or sinusoidal nature of the recreated output voltage sine wave of the output power stage (inverter). The input Power Factor Correction (PFC) power stage and the output power stage (inverter) operate in an on-line manner to continuously regulate power to the critical load. The input PFC stage is capable of full battery recharge while simultaneously providing regulated power to the load for all line and load conditions within the range of the UPS specifications.
 - 1. **Overload Capability:** See above specification

-8-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

2. **Output Relay:** The output power stage (inverter) is equipped with an output mechanical relay to provide physical isolation of the inverter from the critical bus. The UPS when installed with Bypass Panel, allows the user to replace the failed UPS from the critical bus without interruption.
 3. **Battery Protection:** The inverter is provided with monitoring and control circuits to limit the level of discharge on the battery system. The UPS employs a DC Breaker to protect the system from shorting of the battery supply. The battery harness which is sold as an accessory employs fuse protection.
- B. **Battery:** Upon failure of the AC input source, the critical load continues being supplied by the output inverter, which derives its power from the battery system. There is no interruption in power to the critical load during both transfers to battery operation and retransfers from battery to normal operation.
1. The UPS battery system and battery harness are sold separately as accessories. Batteries can be purchased in a 50 Ah or 100 Ah configuration, a total of 4 batteries are need to create the 48VDC that the UPS battery input requires. These replacement batteries are user-replaceable.
 2. The batteries of the UPS models in this specification are maintenance-free, leak-proof, valve-regulated lead-acid (VRLA) batteries with suspended electrolyte.
 3. The UPS incorporates the Intelligent Battery Management system to continuously monitor the health of the battery system. This UPS notifies the user in the event that a failed or weak battery is found.
 4. The UPS is not shipped with batteries; they must be purchased separately.
- C. **Charging:** Upon restoration of the AC input source, the UPS simultaneously recharges the battery and provides regulated power to the critical load.
1. The intelligent battery management system contains a temperature monitoring circuit and temperature compensation algorithm that regulates the battery charging voltage and current so as to optimize battery life.
 2. The battery charging circuit remains active when in bypass or online states.
 3. The UPS can be restarted immediately after a prolonged power outage without waiting for the battery to be recharged.
- D.
- E. **Bypass:** During bypass operation the utility power is connected to the load, bypassing the internal converters. The system automatic bypass provides a transfer of the critical load from the Inverter output to the automatic bypass input source during times when the inverter cannot support the load. The design of the automatic bypass switch power path consists of a bypass relay.
1. **Automatic Transfers:** An automatic transfer of load to bypass takes place if the load on the critical bus exceeds the overload rating of the UPS. Automatic transfers of the critical load from bypass back to normal operation takes place when the overload condition is removed from the critical bus output of the system or when other causes are corrected. When the system is in bypass mode, if bypass line becomes unavailable, the UPS will automatically switch to Online mode operation. In the event that mains power is unavailable the UPS will switch to battery power.
 2. **Manual Transfers:** Manually initiated transfers to and from bypass may be initiated by the user display interface.

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

2.3 INPUT PFC POWER STAGE

- A. **General:** The input Power Factor Correction (PFC) power stage of the UPS constantly rectifies the power imported from the mains input of the system, converting input mains AC power to DC power for precise regulation of the DC bus voltage, battery charging, and output power stage (inverter) regulated output power.
- B. **Input Current Total Harmonic Distortion:** The input current THDI at full system load will be held to 7% at 50% load and 5% at full load while providing conditioned power to the critical load bus and charging the batteries under steady-state operating conditions. This is true while supporting loads of both a linear or nonlinear type. This will be accomplished with no additional filters, magnetic devices, or other components.
- C. **Input Current Limit:**
1. In cases where the source voltage to the UPS is nominal and the applied UPS load is equal to or less than 100% of UPS capacity, input current will not exceed 178% of UPS output current, while providing full battery recharge power and importing necessary power for system losses.
- D. **Charging:**
1. The battery charging circuit contains a temperature monitoring circuit, which regulates the battery charging current to optimize battery life.
 2. The battery charging circuit remains active when the UPS is in automatic bypass and in normal operation
 3. The UPS charging circuit can deliver charge current at 15 Amps. Charge current is automatically adjusted with battery Ah, temperature and load.

2.4 OUTPUT POWER STAGE (INVERTER)

- A. **General:** The UPS output power stage (inverter) constantly recreates the UPS output voltage waveform by converting the DC bus voltage to AC voltage through a set of IGBT-driven power converters. In both normal operation and battery operation, the output power stage (inverter) creates an output voltage independent of the mains input voltage. Input voltage anomalies such as brown-outs, spikes, surges, sags, and outages, shall not affect the amplitude or sinusoidal nature of the recreated output voltage sine wave of the output power stage (inverter).
- B. **Overload Capability:** The output power stage (inverter) is capable of withstanding 150% overload for 30 seconds or 125% overload for 1 minute or 105% overload for indefinite length of time.
- C. **Output Relay:** The output power stage (inverter) is equipped with an output mechanical contactor to provide physical isolation of the inverter from the critical bus. With this feature a failed inverter will be removed from the critical bus. The UPS when installed with Bypass panel, has the provision of isolating the defective UPS from the critical Bus. This is achieved through Contactors used in the Bypass panel. This feature allows the user to replace the defective UPS without disrupting the power to the critical loads

-10-

REVISION OF SECTION 614 UNINTERRUPTED POWER SUPPLY SYSTEM

- D. **Battery Protection:** The inverter is provided with monitoring and control circuits to limit the level of discharge on the battery system. The UPS comes with a 48 Vdc breaker to protect the battery supply. The battery harness is fused adding an additional layer of protection.

2.5 DISPLAY AND CONTROLS

- A. **Control Logic:** The UPS is controlled by an embedded microcontroller which performs the following functions:
1. Monitoring the quality of the output voltage.
 2. Monitoring vital parameters of the UPS.
 3. Executing the state machine.
 4. Intelligent battery management.
 5. Controlling the input and output power stage.
 6. Remaining runtime calculation.
 7. Self-diagnostics, self-test, and proactive fault detection.
 8. Communication to the integrated Network Management Card.
- B. **Display Interface:** Located on the front of the UPS is an LCD user display comprised of a graphical, high resolution (3"x3") LCD (256 x 128 Pixels) and 5 pushbutton switches.
- Control Functions:** The following controls functions can be accomplished by use of the pushbutton switches:
1. POWER ON/OFF button.
 2. Escape button.
 3. OK button.
 4. Up button.
 5. Down button.
- C. **LED Status:** Located 4 Led's on the front of the UPS to read the status of the secure UPS
1. Green LED - Output ON
 2. Yellow LED - SecureUPS notification
 3. Red LED - Unit needs attention
 4. Blue LED - Information
- D. **Data displayed on the Display Interface:** The following indicators are available on the Display Interface Unit:
1. Load icon and disable/mute audible alarm icon.
 2. The UPS status information (Input and Output Voltage, Battery voltage and Load,).
 3. Operation mode (On-Line mode, Bypass mode, and Battery mode).
 4. Battery status icons.
 5. Output relay Icon (Open/Close).
 6. Backlight screens: Amber is an indication that requires attention and Red indicates a UPS alarm that requires immediate attention

-11-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

- E. **Audible Alarms:** Using audio signal, the UPS will notify the user about important events. The following is the list of distinct audio alarms:
1. The UPS is on battery.
 2. The UPS is on battery and the remaining battery capacity is low.
 3. The UPS has shut down due to low battery capacity.
 4. The battery needs to be replaced.
 5. The UPS is overloaded.
 6. The UPS is in fault state.
- F. **Output Relays:** The UPS provides 6 programmable Output relay ports on the front panel. The following function can be programmed to each output relay.
1. On Battery
 2. On Battery Peak
 3. Low Battery
 4. Alarm
 5. Fault
 6. Output ON
 7. Output Off
 8. Online (Inverter Mode)
 9. Bypass
 10. Timer – Peak load, ON battery,
- G. **Input Contacts:** The UPS provides 2 programmable Input contacts on the front panel:
- The following function can be programmed to each input contacts.
1. Self-Test
 2. Alarm ON (External Alarms to System)
 3. Alarm OFF (External Alarms to System)
 4. Output ON
 5. Output OFF
- H. **Flash Mode Setting:**
1. Signal flash Voltage (Battery Voltage): Can be configured by the user to enable the flash mode operation.
 2. For details of the available settings refer to the operation manual.
- I. **Communication Interface:** For purposes of remote communications with the UPS the following are available and contained within the UPS:
- 1) The UPS has the following ports available; serial port (RJ45 – for manufacturing purposes only, USB Host port for use with a USB flash drive.
 - 2) Ethernet Port allows communications over a network via web browser or SNMP or with APC StruxureWare™ management software.
 - 3) Universal I/O port can be used to connect Temperature/Humidity sensors for environment monitoring.

-12-

REVISION OF SECTION 614 UNINTERRUPTED POWER SUPPLY SYSTEM

2.6 BATTERY

- A. The UPS does not ship with batteries. Batteries can be purchased separately and are available in 50 Ah and 100 Ah formats. Other amp hour types can be used but the user must program the battery amp hour into the UPS to ensure appropriate charging of the battery system.
- B. Battery Temperature Sensor connector – Used with the battery system, monitors the temperature of the battery system which is used by the UPSs temperature compensated charger circuitry.
- C. The batteries are of the valve regulated lead acid (VRLA) type. The following are the recommended Batteries for different AH:
50Ah: XB050XX1XS
100Ah: XB102XX1XS

2.7 SMART BATTERY MANAGEMENT

- A. Features:
 - 1. Monitors and informs the user of the health of each battery system.
 - 2. Monitors and shows on the UPS Display Interface screen the date for the end of useful life for the battery system.
 - 3. Emits an alarm and shows a message on the UPS Display Interface screen to indicate the estimated battery end of life. On the UPS Display Interface screen, the user can set the number of days before the alarm is heard and the message appears on the UPS Display Interface screen.
 - 4. Monitors the temperature of the battery system and automatically adjusts the battery charging.
- B. Maintenance:
 - 1. Uses sealed lead acid battery cells and does not require maintenance.
 - 2. Runtime Test (Calibration): This should be performed anytime the steady state load is changed significantly, for example when a new load is added to or removed from the UPS.
 - 3. Battery health monitoring: The battery energy output and voltage are monitored to assess the health of the installed batteries when the UPS is operating on battery.
 - 4. Battery health monitoring is done during a UPS Self-Test and also during a Runtime Calibration Test. These Self-tests are activated when the UPS is operating on battery power. The UPS can be configured to perform periodic, automatic Self Tests.
- C. End of useful life
 - 1. Near end of life notification: A warning message will appear on the UPS display interface screen when the battery system is approaching the end of its useful life. For configuration details refer to Replacement Notification Time and Replacement Battery Alarm Time. The estimated replacement date for the battery system is available through the UI.
 - 2. Needs replacement notification: The UPS display interface screen shows when the battery system replacement is required. All the four batteries must be replaced immediately after the notification.

-13-
REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM

CAUTION: Continued operation after end of useful life notification may cause damage to the batteries.

3. Recycling: Please recycle the battery system.

PART 3 - ACCESSORIES

3.1 BATTERIES

The Battery supplied by the vendor shall meet, at a min, the following requirements

A. Battery Type:

1. Be deep discharge rated and the battery enclosure shall be made up flame arresting, self-sealing, valve regulated lead acid (VRLA) batteries. The batteries shall have a high rate of discharge and be superior in rate of charge absorption. The internal construction shall be of Absorbent Glass Mat (AGM). The battery container shall be made up of flame retardant material. The batteries shall be hermetically sealed, when subjected to extreme condition, the hydrogen gas emitted shall not be more than 10 ppm. The supplied batteries are designed to be installed in any position without any leakage.

B. Battery Specification:

CAPACITY (Ah) 20 hrs to 1.8 Vpc at 77° F	NOMINAL VOLTAGE (V)	POWER PER CELL (W) 20 Min to 1.67 Vpc/cell	WEIGHT (Kg)	LENGTH (Inches)	WIDTH (Inches)	HEIGHT (Inches)	COPPER INSERTED TERMINALS (inches)
50	12	111.5	16.6	9.02	5.43	8.07	0.63 - 0.236 T6
96	12	223	31	12.99	6.81	8.35	0.787-0.236 T11

C. Battery Status and Health:

1. The BBS shall have a provision to select the battery Ah capacity through User Interface on the front panel of the BBS. The BBS also shall have the run time prediction software and the remaining run time shall be displayed on the User Interface provided on the BBS. The BBS shall also have the provision for the user selectable temperature compensation settings for the optimal charging of the selected batteries. The BBS shall also include the battery life prediction analytics to determine the end of life of the connected batteries.

-14-

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

3.2 BATTERY HARNESS

The battery harness supplied by the contractor shall be designed to facilitate an easy connection and disconnection of the cables between the batteries and BBS system. Also, the harness should have a provision to seamlessly include an additional set of batteries. The harness should allow the replacement of the battery set without the use of tools. All the battery harness interconnected wiring shall conform to UL Style 1015 CSA TEW or equivalent. Wiring shall be of proper gauge with respect to design current and with sufficient strand count for flexibility.

A. Battery harness set:

1. The battery harness set consists of
 - a) 4 battery connection cables
 - b) 1 battery interconnection harness with a provision for BBS connection
 - c) 1 extension cable harness for installations where the distance between the batteries and the BBS is greater than the length of the battery interconnection harness

2. Battery Connection Cables:
 - a) The battery connection cables consist of a pair of cables that connect to the battery positive and negative terminals. The other end of these two cables are terminated on a connector of the type SBS75 from Anderson connectors or equivalent. The battery side connection of the cables shall be provided with a ring lug with a provision for an M8 screw. The battery side ring lug must be secured with an insulating cap that covers the battery terminals when installed. The cap should provide protection against accidental contact with live terminals of the battery. The caps are ergonomically designed for easy installation and removal. The quality of the caps provided should withstand repetitive usage.

3. Battery Interconnection Harness
 - a) The main purpose of this harness is to facilitate the interconnection between batteries and the BBS system. The battery interconnection harness shall have mating connectors that match the connectors on the battery connection link and the BBS. The battery interconnection harness should include a 200 Amp fuse to protect against any short circuit on the BBS side. The battery interconnection harness should support the connection of an additional set of batteries.

4. Extension Cable Harness
 - a) The extension cable harness is to be installed along with battery interconnection harness for extending distance between the BBS and the battery bank. The cable ends are terminated on the matching connector to accommodate the BBS connection on one end and battery interconnection harness on the other end. Extension cable harness shall be 8 ft in length.

-15-
REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM

B. Other Harness Accessories included:

1. The other accessories to be included are battery cable hardware, cable ties, temperature sensor cables and any other accessory necessary for completing the installation.

3.3 SERVICE BYPASS UNIT

A. Service Bypass Unit (SBU):

The SBU provides power to the critical load bus from the bypass source during times when maintenance or service of the BBS is required. The SBU provides a mechanical means of complete isolation of the BBS from the electrical wiring of the installation.

1. Output Specifications

	Parameter	Specification
1	Nominal Output Voltage (V)	120
2	Changeover Switch capacity (Amps)	30 (Minimum)
3	Output Current (Amps)	30
4	Output Connections	30 Amps, 3 Pole, Anderson quick disconnect type

2. Input Specifications

	Parameter	Specification
1	Nominal Input Voltage (V)	120
2	Input frequency (Hz)	50/60
3	Input Connections	30 Amps, 3 Pole, Anderson quick disconnect type
2	Load Power Factor Range	0 to 1
4	Maximum Input Current (Amps)	30

1. SBU Construction

- a) The SBU is constructed in a rack-mounted 2U enclosure unless otherwise stated in this specification. This unit may also be mounted in a vertical orientation.

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY SYSTEM**

- 2. SBU Bypass Switch Type
 - b) The SBU shall have a manually operated rotary switch with **MAKE BEFORE BREAK** mechanism. The switch shall have two operating positions; Normal mode and Bypass mode. In Normal mode, power is directed from the utility outlet, through the bypass panel and BBS to connected equipment at the output of the SBU. In Bypass mode, power from the utility is directly fed to connected equipment. Also, in Bypass mode, the BBS shall be galvanically isolated from the SBU for safe maintenance or replacement

- 3. SBU and BBS Connection
 - c) The connection between SBU and BBS should be achieved with a single harness with an easy connect-disconnect facility. The easy connect-disconnect may be achieved by an Anderson Powerpole connector of adequate capacity. The construction and insulation levels of the Powerpole connectors should provide protection against accidental contact with live parts in the connector housing. The connectors should be ergonomically designed for an easy connect and disconnect operation. The connectors should also have a locking mechanism to avoid any loose contacts

PART 4 – EXECUTION

4.1 FIELD QUALITY CONTROL

A. Manufacturer Field Service:

- 1. **Worldwide Service:** The UPS manufacturer has a worldwide service organization available, consisting of factory-trained field service personnel to perform startup, preventive maintenance, and service of the UPS system and power equipment. The service organization offers service support 24 hours a day, 7 days a week, 365 days a year.
- 2. **Replacement Parts:** Parts are available through the worldwide service organization 24 hours a day, 7 days a week, 365 days a year. The worldwide service organization is capable of shipping parts within four working hours or on the next available flight, so that the parts may be delivered to the customer site within 24 hours.

4.2 MAINTENANCE

- A. A complete offering of preventive and full service maintenance contracts for the UPS system and the battery system are available from APC by Schneider Electric. Contract work is performed by Schneider Electric factory-trained service personnel.

Subsection 6.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Uninterrupted Power Supply System	Each

**REVISION OF SECTION 614
CLOSED CIRCUIT TELEVISION CAMERA (TRAFFIC MONITORING)**

Section 614 of the Standard Specifications is hereby revised to include the following:

Subsection 614.01 shall include the following:

This work consists of the installation of a closed-circuit television camera at the locations shown on the plans.

Subsection 614.08 shall include the following:

(m) Closed Circuit Television Camera (Traffic Monitoring)

Closed circuit television camera shall be the Panasonic WV-X6531NS.

The following accessories shall be provided for each IP camera:

Panasonic PAPM4 Pole Mount Bracket

Panasonic PWM20G Gooseneck Black

Transformer Altronix T2428100 24 VAC.

Veracity VOR-OS Outsource Midspan 15/20W POE 802.3AF Injector – 1 port

Subsection 614.10 shall include the following:

The closed-circuit television camera shall be installed in accordance with the details shown in the plans and in accordance with manufacturer’s recommendations. The Contractor shall deliver the camera and accessories to the City and County of Denver’s Traffic Operations Department at 5440 Roslyn, Denver, Colorado at least 4 weeks prior to installation for the camera calibration and set up. The Contractor shall pick up the camera and shall install it at the proper location. The Contractor shall make arrangements for a City and County of Denver Traffic Operations’ representative to be on-site to ensure proper installation.

Subsection 614.13 shall include the following:

Closed circuit television cameras will be measured by the actual number of closed circuit television cameras that are installed and accepted. All accessories shall not be measured separately.

Subsection 614.14 shall include the following:

Pay Item

Closed Circuit Television Camera (Traffic Monitoring)

Pay Unit

Each

Payment will be full compensation for all labor, materials, accessories, and equipment required to complete the work.

-1-

**REVISION OF SECTION 614
FIBER OPTIC CABLE - GENERAL**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work provides for the installation of fiber optic communications cable to be installed in conduit or duct as specified in the plans. All labor and materials required to fan-out, terminate, splice or otherwise connect fiber optic cables at individual controller cabinets, will be paid separately under the Telemetry (Field) pay item. The contractor shall be required to demonstrate successful signal system communications to the Engineer as a requirement of acceptance of this item.

Subsection 614.10 shall include the following:

All fiber-optic interconnect cable shall be furnished by the Contractor, and installed, spliced (if required and only as approved by the Engineer), terminated, connected and tested by the Contractor. The number denoted prior to the "MM" designator identifies the number of multi-mode fibers (Strands) in the cable. The number denoted prior to the "SM" designator identifies the number of single-mode fibers (Strands) in the cable.

Cable ends shall be stored in pull boxes or splice closures at locations indicated in the plans or as directed by the Engineer. Fibers to be spliced and/or connected in any manner shall be limited to those identified in the plans, and only in designated controller cabinets or splice closures. All other fibers shall be left uncut or sealed as appropriate in a manner recommended by the cable manufacturer.

Fiber optic cable shall be installed in a continuous run between all controller cabinets and splice closures as shown in the plans. Lateral cables shall be spliced only in splice closures and routed to the controllers as shown in the plans. **Under no conditions shall the fiber cable be cut out or spliced at intermediate points without the express written direction of the Engineer.**

Cable shall be installed in new conduit or existing conduit as specified in the plans. The Contractor shall be required to leave a minimum of 10 feet of cable slack in the equipment controller cabinet. The Contractor shall leave a minimum of 50 feet of cable slack in the pull box adjacent to the controller and shall leave a minimum of 50 feet of slack in all other communication pull boxes.

Cable Tags and Labels:

Fiber optic cable shall be neatly coiled and clearly tagged and labeled at each communication pull box and at all locations where the fiber is exposed. Cable tags and Labels shall be as follows:

Materials: Metal or heavy plastic identification tags with cable type and number, copper pair or optic number assignments, and destination shall be provided on both ends of all cables (except station cables) and all splice cases. All cables shall be clearly labeled with cable number (City to determine scheme) and size at each end of the cable, when it enters or leaves a conduit and at 30-foot intervals when run in accessible areas such as tunnels, manholes, ceilings, etc.

Manufacturer: Tags shall be 3M, Panduit or an approved equivalent.

-2-

**REVISION OF SECTION 614
FIBER OPTIC CABLE - GENERAL**

General Requirements: The Contractor shall provide the Engineer with two copies of the cable manufacturer's cable specifications and installation instructions for fiber optic cable in conduit. All installation shall be in accordance with these practices except as otherwise directed by the Engineer.

Additional cable costs due to damage caused by the Contractor's neglect of recommended procedures shall be Contractor's responsibility. The main cable shall be installed in continuous runs except where cable type changes or where maximum pull lengths govern. The manufacturer's recommended limits for cable pull tensions shall not be exceeded. Cable ends shall be stored in controller cabinets or pull boxes immediately adjacent to cabinets or as directed by the City.

Lateral and Branch cables shall be installed using appropriate strain relief in the cabinet (through cable ties) at a minimum of three locations.

All fiber optic cables to be installed shall be checked with an OTDR before and after installation. Documentation of fiber performance shall be provided to the City within 30 days of test. All optical fibers shall be within the manufacturer's recommended tolerances. In addition, any other acceptance testing recommended by the manufacturer shall be provided. Data shall be supplied to the City prior to completion of the project.

Fiber optic cable shall be transported to site using cable reel trailers. Care shall be taken at all times to avoid scraping, denting, twisting, or otherwise damaging the cable before, during and after installation. Damaged cable shall be replaced by the Contractor without additional compensation.

Cable shall be installed in conduit or duct in the field in accordance with the contract drawings. The conduit and duct ends shall have all rough edges smoothed to prevent scraping the cable. All existing or suspected dirt and debris within the conduit shall be cleaned with compressed air before installing cable. A manufacturer recommended lubricant shall be applied to the cable to reduce friction between the cable and duct or conduit. Where fiber optic cables are to be installed in inner duct, the Contractor shall secure each section of the conduit to prevent it from being pulled without the cables.

A cable grip shall be attached to the cables so that no direct force is applied to the optical fiber. The cable grip shall have a ball-bearing swivel to prevent the cable from twisting during pulling. Cable rollers and feeders and winch cable blocks shall be used to guide the cable freely into the duct and at maintenance hole locations. Mechanical aids and pulling cable or ropes shall be used as required. **The maximum pulling tension as defined by the cable manufacturer shall not be exceeded.** The cable shall be taken up at intermediate pulling points with an intermediate cable take-up device as approved by the Engineer to prevent over-tension on the cable. Cable pulls shall be continuous and steady between pull points and shall not be interrupted until the entire run of cable has been pulled. Personnel equipped with two-way radios shall be stationed at each maintenance hole, cabinet, pedestal, communications box, and junction box through which the cable is to be pulled to observe and lubricate the cable. Intermediate splices between pull boxes shall not be allowed. The cable shall be securely fastened in place within pull boxes, pedestals, manholes and cabinets.

-3-

**REVISION OF SECTION 614
FIBER OPTIC CABLE - GENERAL**

The contractor shall ensure cable length is sufficient to allow for connection between the communications equipment and the splice equipment and the splice enclosures including provision for slack, vertical runs, cable necessary for splicing, wastage and cable to allow for the removal of the splice enclosure for future splicing.

Lateral and Branch Fiber Optic Cable: Lateral/Branch fiber optic cable shall consist of 6 multi-mode fibers and 6 single-mode fibers. Lateral/Branch fiber optic cable shall be installed in new or existing conduit, or along existing span wire, as depicted in the plans. Cables shall be provided with appropriate strain relief in the cabinet, consisting of cable ties in at least three interior cabinet locations. Lateral and Branch fiber optic cable shall be clearly tagged and labeled as such at pull boxes and all other locations where it is exposed. At any location where the cable is brought into or out of a span wire pole, the Contractor shall install a new weather-head to accommodate the bending radius of the cable.

Subsection 614.13 shall include the following:

Fiber Optic Cable for the main (backbone), lateral and branch cables will not be measured separately, but shall be included in the item Telemetry (Field), and shall include all labor and materials required to install the main, lateral, branch, and start cables through conduits to all pull boxes, cabinets and closures specified in the plans. Installation of all internal field cabinet telemetry, splicing, fan-out and termination of the cable at individual controller cabinets is described and paid for under Telemetry (Field).

Subsection 614.14 shall include the following:

No separate measurement or payment will be made for fiber optic cable. All fiber optic cable shall be considered incidental to the Telemetry (Field) pay item.

-1-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

Section 614 of the Standard Specifications is hereby revised for this project as follows.

Notice:

Every effort has been made to ensure that the information contained in this specification is complete and accurate at the time of publication; however, information contained herein is subject to change.

Trademarks:

ANSI® is a registered trademark of the American National Standards Institute, Inc.

KELLEMS® is a registered trademark of Harvey Hubbell, Inc.

Scope:

This specification covers the general design requirements and performance standards for fiber optic cables intended primarily for use in the outside plant environment. The purpose of this document is to provide the essential requirements for All-Dielectric Single Jacket, Single Jacket / Single Armor, and Double Jacket / Single Armor Loose Tube Fiber Optic cable to be used in the City of Denver networks.

The product requirements and features described in this specification are those considered useful for ensuring proper selection and manufacturing of fiber optic outside plant cables.

In this specification, all observed or calculated values are rounded off "to the nearest unit" in the last right hand place of figures used in expressing the limiting value. The round-off method of ASTM E 29 is used.

These cables should comply with industry standards such as Telcordia Technologies GR-20 (formerly Bellcore), Electronic Industries Association (EIA), Telecommunications Industry Association (TIA), International Telecommunications Union (ITU), International Electrotechnical Commission (IEC), and American Society for Testing and Materials (ASTM).

Optical Fiber Characteristics

High quality optical fibers should be made with pure silica-based glass to have very low loss for infrared wavelengths and to be used to carry large amounts of information for very long distances in optical communication systems.

Details of the optical fibers are not covered in this specification, but the proposed cable should contain AllWave® or TrueWave® fibers for Single-Mode applications, or Multimode fibers that comply with the specific fiber requirements supplied by the City and County of Denver.

-2-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

CABLE CORE CHARACTERISTIC:

1. Color Code:

The individual colors for fibers and buffer tubes in loose tube cable cores should comply with EIA/TIA-598 as given in the following table.

Table 1 – Fiber and Tube Color Code

Fiber or Tube No.	Color
1	Blue (BL)
2	Orange (OR)
3	Green (GR)
4	Brown (BR)
5	Slate (SL)
6	White (WH)
7	Red (RD)
8	Black (BK)
9	Yellow (YL)
10	Violet (VI)
11	Rose (RS)
12	Aqua (AQ)

2. Central Strength Member

The central member functions as an anti-buckling element, and should be a glass/epoxy composite dielectric rod. A polyethylene overcoat may be applied to the central member to provide the proper spacing between buffer tubes during stranding.

3. Loose Tube Cable Buffer Tubes

Optical fibers are enclosed within buffer tubes that have a diameter several times larger than the diameter of the fibers. The optical fibers are loose within the buffer tubes allowing the fibers to move freely. The loose buffer tubes should have a 2.5 mm diameter, with a nominal wall thickness of 0.4 mm. For composite cable designs, when both single-mode and multi-mode fibers are contained within the same cable, the single-mode fibers will be contained in the first buffer tubes. The multi-mode fibers will be contained in the sequenced buffer tubes following the single-mode buffer tubes.

Table 2 – Buffer Tubes

Fiber Count	Buffer Tube OD (mm)	Fibers per Tube
1-288	2.5	12

The buffer tubes (and filler rods, if necessary) must be stranded in a reverse oscillation lay (ROL) technique around the central member to allow for easy mid-span access. The core of buffer tubes should be wrapped with two counter helically applied threads to bind together the cable core.

-3-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

4. Filler Rods

In order to create a round cable, filler rods of the same diameter as the buffer tubes may be used to fill empty positions. Filler rods are made out of HDPE and are natural in color.

5. Water Blocking System

Water blocking of the core outside and around the buffer tubes must be accomplished via “dry” elements. **In addition, water-blocking inside the buffer tubes must be accomplished via “dry” elements as well.**

These “dry” water blocking elements form a gel compound when in contact with water. The gel should effectively fill the interstices of the core and the inside of the tubes to prevent water penetration along the length of the cable. This dry water blocking significantly reduces cable core access time by eliminating the step of cleaning the buffer tubes and fibers upon entry. Additionally, this technology reduces the cable weight.

Dry water blocking elements should be in the form of binders, tapes, or yarns depending on where they are being applied.

CABLE SHEATH CHARACTERISTIC:

The sheaths described in this section are:

- (e) All-Dielectric Single Jacket: One polyethylene jacket, no metallic elements (SJ)
- (f) Strength Elements: Sheath strength elements are applied over the cable core to provide the cable with the required tensile strength. These elements are made of fiberglass (Aramid yarns may be used as well).
- (g) Inner Jacket (NOT APPLICABLE TO THIS PROJECT)
- (h) Steel Armor (NOT APPLICABLE TO THIS PROJECT)
- (i) Outer Jacket: An outer polyethylene jacket is applied over the cable to provide overall mechanical protection. This jacket is made of MDPE (or HDPE upon request) and is usually black. If required, the jacket could have two co-extruded colored tracer stripes located 180 degrees apart to aid in cable identification. The jacket will be continuous, free from pinholes, splits, blisters, or other imperfections.
- (j) Ripcords: For ease of jacket removal, one clearly identifiable polyester ripcord is provided under the outer jacket for SJ designs. SJ/SA designs shall have two under armor ripcords placed 180 degrees apart. DJ/SA designs shall have one ripcord under both the inner jacket and steel armor.

-4-
REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE

Cable Cross-Sections:

Single Jacket (SJ)



Figure 1 – Single Jacket

Table 3 – Target Cable Outer Diameters

NUMBER OF FIBERS								
	2 - 60 (5 Pos.)	2 - 72 (6 Pos.)	73 - 96 (8 Pos.)	97 - 120 (10 Pos.)	121- 44 (12 Pos.)	145-216 (18 Pos.)	217-240 (20 Pos.)	241-288 (24 Pos.)
SHEATH TYPE	Cable OD in. (mm)	Cable OD in. (mm)	Cable OD in. (mm)	Cable OD in. (mm)	Cable OD in. (mm)	Cable OD in. (mm)	Cable OD in. (mm)	Cable OD in. (mm)
SJ	0.42 (10.6)	0.43 (11.0)	0.50 (12.8)	0.57 (14.4)	0.64 (16.2)	0.66 (16.7)	0.69 (17.4)	0.76 (19.2)

-5-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

MECHANICAL, ENVIRONMENTAL AND ELECTRICAL REQUIREMENTS:

These cables must meet the requirements of *Telcordia GR-20-CORE* with all testing performed based on *EIA/TIA-455* standards. The manufacturing company must provide proof of their quality control standards with *ISO 9001* and *TL9000* certifications. The cables should comply with the following temperature ranges:

Operation:	-40°C to 70°C (-40°F to 158°F)
Installation:	-30°C to 60°C (-22°F to 140°F)
Storage/Shipping:	-40°C to 75°C (-40°F to 167°F)

Single-Mode Fibers

Per *Telcordia GR-20*, the magnitude of the attenuation change shall be less than or equal to 0.05 dB for 90% of the test fibers and less than or equal to 0.15 dB for the remaining 10% of test fibers. Cable aging allows for 0.10 dB/km average attenuation change with a magnitude of the maximum attenuation change for each individual fiber to be less than 0.25dB/km. These attenuation values include a 0.05 dB allowance for measurement repeatability during mechanical and environmental testing evidence of cracking, splitting or other failure of the sheath components when examined under 5X magnification would result in failure of the proposed test requirements. In addition, no fiber shall lose optical continuity because of the test.

Table 4 – Testing for Single Mode Fibers

Cable Test	Test Method	Requirement
Tensile Loading and Bending	EIA/TIA-455-33 IEC 794-1-E1	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss
Cyclic Flexing	TIA/EIA-455-104 IEC 794-1-E6	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss
Cyclic Impact	EIA/TIA-455-25 IEC 794-1-E4	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss
Compressive Loading	TIA/EIA-455-41 IEC 794-1-E3	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss
Twist	TIA/EIA-455-85 IEC 794-1-E7	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss
Low and High Temperature Bend	EIA/TIA-455-37 IEC 794-1-E11	90% < 0.05 dB Max. Added Loss 100% < 0.15 dB Max. Added Loss
External Freezing	EIA/TIA-455-98 IEC 794-1-F6	< 0.05 dB Mean Added Loss < 0.15 dB Max. Added Loss
Temperature Cycling	EIA/TIA-455-3 IEC 794-1-F1	<input type="checkbox"/> 0.05 dB/km Mean Added Loss <input type="checkbox"/> 0.15 dB/km Max Added Loss
Cable Aging	EIA/TIA-455-3 IEC 794-1-F1	<input type="checkbox"/> 0.10 dB/km Mean Added Loss <input type="checkbox"/> 0.25 dB/km Max Added Loss
Water Penetration	EIA/TIA-455-82 IEC 794-1-F5	No flow after 24 hours from one meter length of cable

-6-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

Multimode Fibers

Per *Telcordia GR-20*, the allowable attenuation increase during the mechanical and environmental testing is 0.20 dB. Cable aging allows for the maximum attenuation change for each individual fiber to be less than 0.40dB/km.

During mechanical and environmental testing evidence of cracking, splitting or other failure of the sheath components when examined under 5X magnification would result in failure of the proposed test requirements. In addition, no fiber shall lose optical continuity because of the test.

Table 5 – Testing for Multi-Mode Fibers

Cable Test	Test Method	Requirement
Tensile Loading and Bending	EIA/TIA-455-33 IEC 794-1-E1	0.20 dB Max. Mean Added Loss
Cyclic Flexing	TIA/EIA-455-104 IEC 794-1-E6	0.20 dB Max. Mean Added Loss
Cyclic Impact	EIA/TIA-455-25 IEC 794-1-E4	0.40 dB Max. Mean Added Loss
Compressive Loading	TIA/EIA-455-41 IEC 794-1-E3	0.20 dB Max. Mean Added Loss
Twist	TIA/EIA-455-85 IEC 794-1-E7	0.20 dB Max. Mean Added Loss
Low and High Temperature Bend	EIA/TIA-455-37 IEC 794-1-E11	0.40 dB Max. Mean Added Loss
External Freezing	EIA/TIA-455-98 IEC 794-1-F6	0.20 dB Max. Mean Added Loss
Temperature Cycling	EIA/TIA-455-3 IEC 794-1-F1	□ 0.5 dB/km Max Added Loss 80 % □ 0.25 dB/km Added Loss
Cable Aging	EIA/TIA-455-3 IEC 794-1-F1	□ 1.0 dB/km Max Added Loss 80 % □ 0.5 dB/km Added Loss
Water Penetration	EIA/TIA-455-82 IEC 794-1-F5	No flow after one hour from one meter length of cable

Note:

The tensile rating for all of the cables described should be 2.7 kN (600 lbf), with a compression rating of at least 220 N/cm under GR-20 requirements.

-7-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

CABLE MARKING:

Printed Characters

For standard outer jackets, printed characters shall be indent printed with white characters for black jackets, black characters for non-black jackets, or as otherwise specified.

For standard striped outer jackets, printed characters shall be indent printed with white characters for red, green, orange, yellow, blue striped cables, light-blue characters for white striped cables, or as otherwise specified by the customer.

The characters shall be of proper height and space to produce good legibility. Character heights of 2 mm should facilitate adequate readability. An occasional illegible marking is permitted if there is a legible marking on either side.

Markings


The cable shall be sequentially marked at one meter, or two-foot intervals depending on specific requirements issued by the City and County of Denver. The length marks shall not be reset to zero on any length of the cable. The actual length of cable shall be within +1, -0% of the marked length.

Each length of cable shall be marked with the following legend:

"(Manufacturer Name) OPTICAL CABLE,

(Product Part Number),

(Month and Year of Manufacture, [MM-YY]),

(Telephone Symbol []), (Fiber Count [XXX F], where XXX is the number of optical fibers in the cable), and

(Manufacturers' Serial Number) "

Re-Markings

Only one remarking is permitted. If required, either of the following methods for remarking shall be used:

Method A: Completely remove the defective marking and remark the characters with the original color.

Method B: Leave the defective marking on the jacket and remark on a different portion of the cable jacket with yellow character print. The new number sequence shall differ from any other existing marking by at least 5000.

Any cable that contains two sets of markings shall be labeled to indicate the color and sequential numbers to be used. The labeling shall also be applied to the reel tag.

-8-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

CABLE PACKAGING:

Reels

The manufacturer shall supply the product using their standard reel sizes, methods, apparatus, and reel wood lagging, but stenciled according to these specifications. The specifications outlined here are guidelines on what is expected with respect to packaging.

Reels are assumed to be in good working condition, firm, and be able to support the product through shipping and final installation. Reels shall be clean, dry and free of excessive dirt. All reels shall be checked for high nails, stave fit and proper stenciling.

Reel Labels

Each wooden reel shall be permanently marked with the following information:

- (1) “(Manufacturer’s name)” (red paint)
- (2) “OPTICAL CABLE” (black paint)
- (3) An arrow and the wording “cable end” to indicate the position of the outside cable end. (red paint)
- (4) An arrow and the wording “ROLL THIS WAY” to indicate the direction the reel should be rolled to prevent loosening of the cable. (black paint)
- (5) Reel Number (red paint)

Cable handling stickers/cards must be attached to both flanges of every reel. Each sticker must be stapled to the flange. See Figure 4 for illustrations of the stickers to be used.

Reel Lagging

Thermal Protection

Outer layers of the reel shall be covered with a protective wrap to limit the solar heating of the cable. This helps limit the cable surface temperature so that it will not exceed 10 C (18 F) above ambient temperature under maximum solar radiation according to Telcordia GR-20 requirements. All foil wrap shall be securely fastened to the cable by at least 2 pieces of strapping tape.

Composite & Wood Lagging

Reels shipping domestically shall be lagged with a suitable protective wrap (can be the same thermal protection wrap) and banded with steel straps. This wrap shall cover the cable from flange to flange and provided some mechanical protection to the outer layers of cable as well as weather resistance. Reels shipping for export shall be lagged with wooden boards nailed to each flange and banded with steel straps in addition to the protective wrap around the outer layers of cable.

-9-
**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**



Figure 2 – Reel Stickers

Other

Cable Ends

Each end of the cable shall have end seals, either end caps or KELLEMS® pulling grips, in order to prevent moisture ingress into the cable during shipping, storage, or installation.

The top end of the cable shall be securely fastened to the inside of the reel flange to prevent the cable from becoming loose in transit or during handling. The bottom end, “test tail”, shall be approximately three meters in length and easily accessible. The end shall be protected within a cable slot and be securely fastened to the outside of the reel flange with wire ties or walkout straps. Staples, nails or yarn attached to the reel during manufacturing shall be removed.

The cable slot can be partially protected to prevent the cable tail from moving outside this, however for export orders the cable slot must be completely sealed by either metallic protection rings, plywood covers, or other.

-10-

**REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE**

Cable Length Tolerance

Cables ordered to standard factory lengths shall have an actual length within -0% and +5% of the length ordered unless otherwise specified by the customer.

Certified Test Data

Each cable shall have certified test data securely fastened to the reel in a waterproof wrapping. The certified test data sheet shall include the following information:

- Cable Number
- Date
- Customer Name
- Ordered Length
- Customer Order Number
- Ship Length
- Customer Cable Code
- Customer Reel Number
- Customer's Attenuation Specification(s)
- Number of Fibers
- Cable Construction
- Fiber Transmission Data
- Bandwidth Data – only applies to Multi-Mode Fibers
- Authorized Signature

Reel Tag

Each cable shall have a reel tag securely fastened to the reel in a waterproof wrapping. The Reel Tag (Cut Length Data Sheet) shall include the following information:

- Cable Number
- Date
- Customer Name
- Ordered Length
- Customer Order Number
- Ship Length
- Customer Cable Code
- Customer Reel Number
- Customer's Attenuation Specification(s)
- Number of Fibers
- Beginning and Ending Sequential Length Markings
- Gross Weight
- Net Weight
- Inspected By Signature

Quality Assurance Provisions

Prior to installation, all optical fibers shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel.

The cable manufacturer shall be ISO9001-registered.

-11-
REVISION OF SECTION 614
LOOSE TUBE FIBER OPTIC CABLE

All optical fibers shall be tested and documentation submitted for both on-reel testing and testing of fiber after installation.

If any finer strands are tested and fail to meet the minimum requirements provided in the Project Special Provision for Test Fiber Optic Cable, the entire reel of fiber optic cable shall be rejected.

Optical Splice Closures

Splices are not allowed without the authorization of the Engineer. If splices are authorized, each such splice shall occur in a new pull box to be installed by the Contractor, or an existing manhole or pull box already installed along the route.

All splices shall be enclosed in a splice closure. Coyote Runt or Pup Type closures or approved equal shall be used. All closures shall include a 1-inch future port kit (part no. 8003408 Pre-Formed Line Products or approved equal). The Coyote Runt Closure or approved equal shall be used at locations with three (3) fiber optic cables. In locations requiring more than three (3) fiber optic cables, the Coyote Pup Closure or approved equal shall be used. Following successful splicing, said splice enclosure shall be placed inside the described pull box or manhole. Contractor shall accomplish the work using splicing tools and hardware recommended by the cable manufacturer.

Size of the splice closure at specific locations shall be governed by the number of splices required. The average splice loss shall not exceed 0.2dB for any given span.

Buffer Tube Fan-Out

Fan-out kit tools and tool kit consumables shall be of the same manufacture as the fan-out kit. Fanned-out cables shall be terminated at the controller telemetry panel or in the Contractor-furnished termination enclosure as shown in the plans. The fan-out kit shall be placed inside the cabinet side wall-mounted termination enclosure.

The number of fibers to be landed and terminated shall be as shown in the plans.

Termination Enclosure

Contractor shall furnish and install a cabinet side wall-mounted termination enclosure for storage of the fan-out kit and broken-out fibers. This enclosure shall be sized to accommodate the patch panel called out in the plans. Optional guard and dust proofing components shall be included. Contractor shall furnish and install all connector panels, connectors, adaptors, jumpers and/or pigtails required to establish the final connection to the controller.

10.0 Materials List

Prior to ordering, the Contractor shall provide the Engineer with a proposed list of materials to be used for fiber optic cable and peripherals thereto. The list of materials shall include fiber optic backbone and lateral cable, patch cord cable, connectors, miscellaneous cabling, optical splice closures, buffer tube fan-out kits and termination enclosures.

-1-

**REVISION OF SECTION 614
TEST FIBER OPTIC CABLE**

Section 614 of the Standard Specifications is hereby revised for this project as follows.

Subsection 614.08(p), Test Fiber Optic Cable, is hereby added to the Standard Specifications and shall include the following:

This work consists of testing fiber optic cable. Testing shall include both new cable and existing cable. The test procedures involve an OTDR test and an Optical Power Meter Test.

The guidelines for fiber optic cable testing include:

Test jumpers and patch cords must be of the same fiber core size and connector type as the cable system.

The light source and OTDR must operate with the range of 1310 ± 10 nm or 1550 ± 20 nm for testing in accordance with ANSI/EIA/TIA-526-7.

The power meter and the light source must be set to the same wavelength during testing.

The power meter must be calibrated and traceable to the National Institute of Standards and Technology (NIST).

All system connectors, adapters and jumpers must be cleaned as per manufacturer's instructions before measurements are taken.

MATERIALS

The following items are required to perform fiber optic cable tests:

- (1) an OTDR;
- (2) a test reel, if necessary;
- (3) a light source at the appropriate wavelength;
- (4) Optical Power Measurement Equipment; and
- (5) Test Jumpers as specified below.

- (a) CPR Test Jumper-1 and Test Jumper-2 shall be 1-5 meters long with connectors compatible with the light source and power meter and have the same fiber construction as the link segment being tested.

OPTICAL FIBER CABLE TESTING WITH O.T.D.R

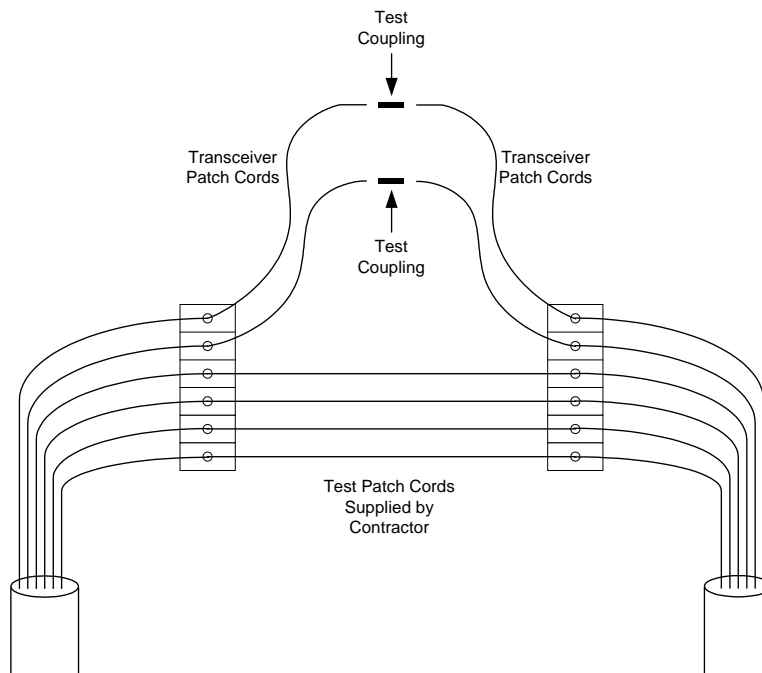
The Contractor shall perform an OTDR test of all fibers in all tubes on the reel prior to installation of the fiber. The test results shall be supplied to the Engineer prior to installation of the cable.

-2-

REVISION OF SECTION 614 TEST FIBER OPTIC CABLE

If the fiber is specified as “Install Only”, the Contractor shall test the fiber on the reel and provide the test results to the Engineer prior to accepting the cable. After installation, if there are unused portions of cable remaining on the reel, the Engineer may request the Contractor or other qualified technician to perform a reel test. The Contractor shall provide the Engineer the test results prior to delivering the cable to the Engineer. Any cable damaged while in the Contractor’s possession shall be replaced at the Contractor’s expense.

All fiber testing shall be performed on all fibers in the completed end-to-end system. Testing shall consist of a bi-directional end-to-end OTDR trace performed per TIA/EIA-455-61. The system margin loss measurements shall be provided at 1310 and 1550nm. If the Plans require installation of a fiber optic patch panel, the Contractor shall supply patch cords to patch all terminated fibers through the panel for all fiber testing. If patch cords are specified in the Plans for final equipment installation, these patch cords shall be connected using a test coupling for the end-to-end test.



OTDR readings will be used to ensure proper installation and to troubleshoot faults. OTDR signature traces will be used for documentation and maintenance. An OTDR provides an indirect estimate of the loss of the cable plant, generally, more accurate or reliable values will be obtained by using an Optical Power Meter. For fibers that are identified in the Plans to be left non-terminated, an OTDR shall be used to test end-to-end attenuation.

Loss numbers for the installed link shall be calculated by taking the sum of the bi-directional measurements and dividing that sum by two.

The Contractor shall use an OTDR that is capable of storing traces electronically and shall save each final trace.

-3-

REVISION OF SECTION 614 TEST FIBER OPTIC CABLE

To ensure the traces identify the end points of the fiber under test and the fiber designation, the Contractor shall use a test reel, if required, to eliminate the “dead zone” at the start of the trace so that the start of the fiber under test can be identified on the trace. Indicate the length of the test reel for all test results.

If the fiber designation is not indicated on the trace itself, the Contractor shall provide a cross-reference table between the stored trace file name and the fiber designation.

In compliance with EIA/TIA-455-61 “Measurement of Fiber or Cable Attenuation Using an OTDR” the Contractor shall record the following information during the test procedure:

- Names of personnel conducting the test.
- Type of test equipment used (manufacturer, model, serial number, calibration date).
- Date test is being performed.
- Optical source wavelength and spectral width.
- Fiber identification.
- End point locations.
- Launch conditions.
- Method of calculation for the attenuation or attenuation coefficient.
- Acceptable link attenuation.

OPTIC FIBER CABLE TESTING WITH OPTICAL POWER METER

The Contractor shall conduct an Optical Power Meter Test for each fiber installed.

Fiber optic cable segments shall be tested in one direction at both the 1310 nm and 1550 nm wavelength.

In compliance with TIA/EIA-526-7 “Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant,” the following information shall be recorded during the test procedure:

- (1) Names of personnel conducting the test.
- (2) Type of test equipment used (manufacturer, model, serial number, calibration date).
- (3) Date test is being performed.
- (4) Optical source wavelength and spectral width.
- (5) Fiber identification.
- (6) End point locations.
- (7) Test direction.
- (8) Reference power measurement (when not using a power meter with a Relative Power Measurement Mode).
- (9) Measured attenuation of the link segment.
- (10) Acceptable link attenuation.

-4-

REVISION OF SECTION 614 TEST FIBER OPTIC CABLE

The minor attenuation differences due to test direction are on par with the accuracy and repeatability of the test method. Lateral segments within a building are limited to 90 meters. Therefore, attenuation differences caused by wavelength are insignificant, and as a result, single wavelength testing is sufficient.

ACCEPTABLE ATTENUATION VALUES

Acceptable attenuation values shall be calculated for each fiber tested. These values represent the maximum acceptable test values.

SM Fiber. The general attenuation equation for any SM link segment is as follows:

Acceptable Link Attn. = Cable Attn. + Connector Attn. + Splice Attn.

8.3 μ m Single-mode Attenuation Coefficients:

Cable Attn.=Cable Length (km) x (0.34 dB/km@1310 nm or 0.25 dB/km@1550 nm)

Connection Attn. (ST or SC connectors)=(No. of Connections x 0.39 dB)+0.42 dB.

Connection Attn. (LC connectors)=(No. of Connections x 0.14 dB)+0.24 dB.

Splice Attn. (Mechanical or Fusion)=Splices x 0.30 dB.

MM Light Source CPR Adjustment					
	<i>Cat. 1 Overfilled</i>	<i>Cat. 2</i>	<i>Cat. 3</i>	<i>Cat. 4</i>	<i>Cat. 5 Underfilled</i>
Links with ST or SC Connections	+0.50	0.00	-0.25	-0.50	-0.75
Links with LC Connections	+0.25	0.00	-0.10	-0.20	-0.30

The Coupled Power Ratio of a light source is a measure of the modal power distribution launched into a multimode fiber. A light source that launches a higher percentage of its power into the higher order modes of a multimode fiber produces a more over-filled condition and is classified as a lower category than a light source that launches more of its power into just the lower order modes producing an under-filled condition. Under-filled conditions result in lower link attenuation, while over-filled conditions produce higher attenuation. Therefore, adjusting the acceptable link attenuation equation to compensate for a light source's launch characteristics increases the accuracy of the test procedure.

SM FIBER: The general attenuation equation for any SM link segment is as follows:

Acceptable Link Attenuation = Cable Attenuation + Connector Attenuation + Splice Attenuation

-5-

REVISION OF SECTION 614 TEST FIBER OPTIC CABLE

8.3 nm Single-Mode Attenuation Coefficients:

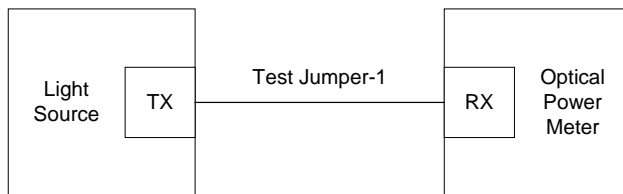
- Cable Attenuation = Cable Length (km) x (0.34 dB/km@1310nm or 0.25 dB/km@1550nm)
- Connection Attenuation (ST or SC connectors) = (# of Connections x 0.39 dB)+0.42 dB. No more than 0.75 dB per connector.
- Connection Attenuation (LC connectors) = (# of Connections x 0.14 dB)+0.24 dB.
- Splice Attenuation (Mechanical or Fusion) = Splices x 0.20 dB

TEST PROCEDURES

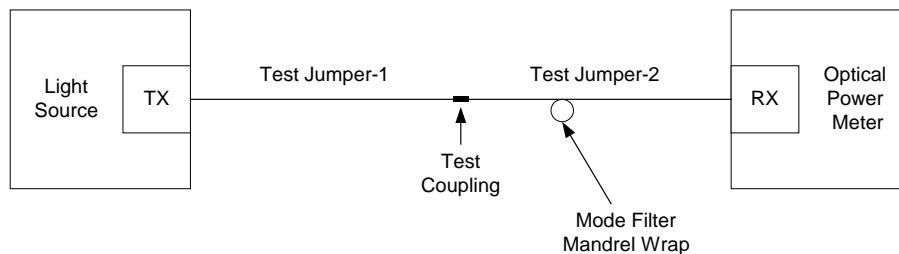
All fiber testing shall be performed on all fibers in the completed end-to-end system.

MM FIBER: The MM fiber cable test shall be conducted as follows:

- Clean the test jumper connectors and the test coupling per manufacturer's instructions.
- Follow the test equipment manufacturer's initial adjustment instructions.
- Connect Test Jumper-1 between the light source and the power meter. Avoid placing bends in the jumper that are less than 100 mm (4 inches) in diameter.



- If meter has Relative Power Measurement (PM) Mode, use it. If not, reduce the Reference PM (Pref). If meter can display power levels in dBm, select this unit to simplify calculations.
- Disconnect Test Jumper-1 from power meter. Do NOT disconnect test jumper from light source.
- Connect Test Jumper-2 between power meter and Test Jumper-1 using test coupling. Test Jumper-2 should include a high order mode filter. This is done by wrapping jumper 3 times around 30mm (1.2") diameter mandrel.



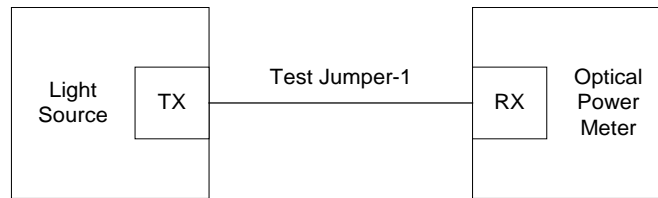
-6-

REVISION OF SECTION 614**TEST FIBER OPTIC CABLE**

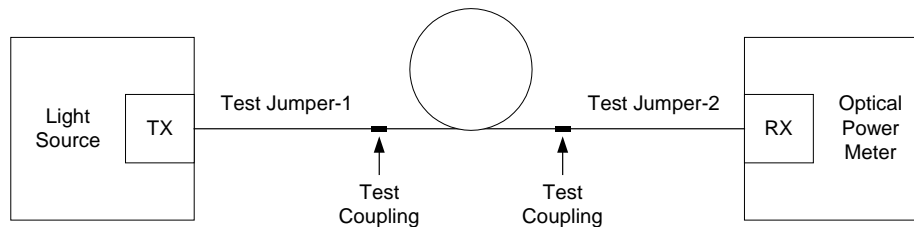
- Record PM (Psum). If power meter is in Relative PM Mode, reading represents CPR value. If meter does not have Relative PM Mode, perform the following calculation:
 - If Psum and Pref are in the same logarithmic units: $CPR (dB) = Psum - Pref$
 - If Psum and Pref are in watts: $CPR (dB) = 10 \times \log_{10} [Osum/Pref]$

SM FIBER: The SM Optical Power Meter fiber test shall be conducted as follows:

- Clean the test jumper connectors and test coupling per manufacturer's instructions.
- Follow the test equipment manufacturer's initial adjustment instructions.
- Connect Test Jumper-1 between the light source and the power meter. Avoid placing bends in the jumper that are less than 100mm (4 inches) in diameter.



- If the power meter has a Relative Power Measurement Mode, select it. If it does not, reduce the Reference Power Measurement (Pref). If the meter can display power levels in dBm, select this unit to simplify subsequent calculations.
- Disconnect Test Jumper-1 from power meter. Do NOT disconnect test jumper from light source.
- Attach Test Jumper-1 to one end of the cable plant to be measured and attach Test Jumper-2 to the other end.



- Record the PM (Psum). If the power meter is in Relative PM Mode, the meter reading represents the true value. If the meter does not have a Relative PM Mode, perform the following calculation:
 - If Psum and Pref are in the same logarithmic units: $CPR (dB) = Psum - Pref$
 - If Psum and Pref are in watts: $CPR (dB) = 10 \times \log_{10} [Osum/Pref]$

-7-

**REVISION OF SECTION 614
TEST FIBER OPTIC CABLE**

TEST ACCEPTANCE

The Contractor shall demonstrate that each Optical Power Test results in acceptable attenuation values.

The Contractor, solely at the Contractor's cost, shall remake any fusion splices and/or connectors that have test results exceeding acceptable attenuation values.

The Contractor, solely at the Contractor's cost, shall retest any fiber links that have been re-spliced.

The Contractor, solely at the Contractor's cost, shall bring any link not meeting the requirements of this specification into compliance.

SUBMITTALS

The Contractor shall submit test results documentation as both a hard copy and electronic copy.

After each reel test, the Contractor shall submit two (2) hard copies of the OTDR trace for every fiber on the reel. After installation, the Contractor shall submit two (2) hard copies of the OTDR trace for every spliced fiber. Hard copy traces shall be organized and bound in logical order in an 8-½" x 11" 3 ring hard cover binder in addition to other documentation listed in this Special Provision and other splicing documentation listed in the project Special Provision package.

The Contractor shall submit, after approval of the hard copy traces, electronic copies of all traces and appropriate software to allow reading the traces.

The Contractor shall submit two (2) copies of all Optical Power Test results.

The Contractor shall submit two (2) copies of the contract plans, including additional drawings issued as part of any change orders, with any deviations clearly marked in color. Deviations to be noted shall include but not be limited to the following:

- Fiber splice location;
- Fiber splice configuration; and
- Termination layout.

-8-

**REVISION OF SECTION 614
TEST FIBER OPTIC CABLE**

Subsection 614.13 shall include the following:

The complete end-to-end OTDR test on one fiber, including document submission, represents one OTDR test.

The complete end-to-end optical power meter test on one fiber, including document submission, represents one optical power meter test.

Subsection 614.14 shall include the following:

No separate measurement or payment will be made for fiber optic cable testing. All cable (system) testing shall be considered incidental to the Telemetry (Field) pay item.

-1-

**REVISION OF SECTION 614
ETHERNET MANAGED SWITCH**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work consists of the installation of an Ethernet Managed Field Switch in the CCD controller cabinets. The Contractor shall furnish and install the switch within the Traffic Signal Cabinet as an integral part of the Traffic Signal Controller and Cabinet Assembly.

Subsection 614.08 shall include the following:

The Ethernet Managed Field Switch installation is hereby added to the Special Provision and the Ethernet Switch shall comply with the following specifications:

General System Requirements –The Ethernet Managed Field Switch shall be one that is currently stock by the City and County of Denver or approved equal. The current Ethernet Managed Field Switch that is stocked by the City and County of Denver is the Hirschmann Managed Fast/Gigabit Industrial Ethernet Switch and comprises of the following parts:

- (1) Quantity 1- “OpenRAIL Switch Power - Managed Fast/Gigabit Industrial Ethernet Switch, Fanless Design, Power over Ethernet (PoE+) Support with up to 24 Ports and 120 Watt, 24x 10/100 Mbit/s Ethernet Ports, 4x 10/100/1000 Mbit/s Ethernet Ports, 4x FE/GE Combo Ports”
The OpenRAIL Switch Power currently stock by the City and County of Denver is the HIRSCHMANN RSPE32-24044O7T99-TPPZ999HHSE2AXX.X.XX
- (2) Quantity 4 - “SFP Fiberoptic Gigabit Ethernet Transceiver, Extended Temperature Range, 1 x 1000BASE-LX with LC Connector, SFP-GIG-LX/LC EEC”
The Gigabit Ethernet Transceiver currently stock by the City and County of Denver is the HIRSCHMANN 942 196-002
- (3) Quantity 2 - “Empty Module Slot Cover, RSPM”
The Empty Module Slot Cover currently stock by the City and County of Denver to be used for the HIRSCHMANN RSPE32-24044O7T99-TPPZ999HHSE2AXX.X.XX OpenRAIL Switch Power is the HIRSCHMANN 942131001 RSPM-COVER
- (4) Quantity 1 - 48VDC Rail Power Supply”
The 48VDC Rail Power Supply currently stock by the City and County of Denver to be used with the HIRSCHMANN RSPE32-24044O7T99-TPPZ999HHSE2AXX.X. OpenRail Switch Power is the BELDEN 942 200-001, “RPS 260/PoE EEC.

Test Requirements - Contractor shall supply one unit of Ethernet Managed Field Switch to the Engineer for specification compliance testing and approval. If the product passes the compliance test and evaluation, the Contractor will be notified to complete the order. If the product does not pass the specification compliance testing and approval evaluation by CCD-PW Transportation and Mobility, the unit will be returned to the Contractor. The Contractor shall supply other units until satisfactory test results are achieved

-2-

**REVISION OF SECTION 614
ETHERNET MANAGED SWITCH**

Subsection 614.13 shall include the following:

The Ethernet Managed Switch will be not be measured and paid separately but shall be considered included in the unit cost for the controller and cabinet. Furnish, installation and testing of the units are considered included in the work, as are labor and materials required for completion and acceptance of the item. Each individual package shall contain one Ethernet Managed Field Switch, set of mounting bracket(s), Installation and User guides, and Product Registration Card.

Subsection 614.14 shall include the following:

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Ethernet Managed Switch	Each

-1-

**REVISION OF SECTION OF 614
PEDESTRIAN PUSH BUTTON AND INSTRUCTION SIGN**

Section 614 of the Standard Specification is hereby revised for this project as follows:

Subsection 614.08 (f) shall include the following:

1-1: Push button assemblies shall be of the direct push button solid state contact type and shall not have any levers, handles or toggle switches externally or internally. The pushbutton shall be of tamperproof and all weather construction. The pushbutton shall have a protective shroud that is an integral part of the cover and it shall encircle the pushbutton actuator to deter vandalism. The assembly shall be made weatherproof and shockproof by means of synthetic rubber gaskets between the cover and the enclosure and between the plunger and the cover so that it shall be impossible to receive an electrical shock under any weather conditions. The front cover plate shall be secured with stainless steel vandal resistant screws. The push button shall operate on logic ground.

1-2: The solid state switch shall be entirely insulated from the housing and operating button. The pushbutton shall consist of a 2 inch 303 stainless steel metal plunger and an oil and gasoline resistant Piezo driven solid state switch, all encased in a high impact thermoplastic enclosure with four (4) stainless steel mounting screws. The solid state switch shall be normally open and shall be closed with a minimum of pressure on the button ($3lb \pm 1lb$), restoring immediately to the normally open position when the pressure is released.

The aluminum housing shall be the flat back frame type with adjustable mounting staves that will readily enable it to be mounted on any size traffic signal pole or push button standard. The housing shall have a 1/2 inch access hole in the rear for wiring. The housing shall have a bottom threaded conduit entrance hole and shall be provided with a threaded plug so that access is only possible from the rear of the housing. The plug shall not be removable with ordinary tools. The housing shall be painted Dark Olive/Federal Green baked enamel matching to Federal Standard 595A color #14056.

The frame shall have a cast aluminum attachment to allow the mounting of a 9" X 12" pedestrian instruction sign. By removal of 4 screws the frame shall convert to allow the mounting of a 5" X 7 3/4" pedestrian instruction sign.

Pedestrian Instruction Sign:

2-1: Pedestrian instruction signs shall conform to the latest version of the M.U.T.C.D., published by the U.S. Department of Transportation Federal Highway Administration.

2-2: Pedestrian instruction signs shall be Type R10-3a, Type R10-3b, Type R10-3c, R10-3d, and R10-3e as specified in the contract documents (or bid documents).

Pedestrian instruction signs shall be constructed in accordance with the applicable provisions of the current CCD Standard Specifications. Pedestrian instruction sign need not be reflectorized. The sign shall be fabricated with 0.063 aluminum. The signs shall be mounted using four 5/16" mounting holes 4" X 6 3/4" for the 5" X 7 3/4" sign and 7" X 10" for the 9" x 12" sign. The pedestrian instruction signs shall have rounded corners 3/4" radius for the 5" X 7 3/4" sign and 1 1/2" radius for the 9" X 12" sign.

-2-

**REVISION OF SECTION OF 614
PEDESTRIAN PUSH BUTTON AND INSTRUCTION SIGN**

Subsection 614.13 shall include the following:

Pedestrian Push Button and Instruction Sign shall be measured by the number of units installed and accepted.

Subsection 614.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Pedestrian Push Button and Instruction Sign	Each

**REVISION OF SECTION 614
PEDESTRIAN PUSH BUTTON POST ASSEMBLY**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work consists of the installation of a pedestrian push button and steel post assembly at locations as shown on the plans.

Subsection 614.02 shall include the following:

Post for pedestrian push button shall be tubular steel, Schedule 80.

Concrete for foundation shall be Class B.

Pedestrian push button and sign shall meet all ADA requirements.

Wiring for pedestrian push button shall conform to manufacturer recommendations.

Subsection 614.02 shall include the following:

Steel posts and slip base assembly shall be galvanized in accordance with Section 509, unless painting is called for on the plans. Painting shall be in accordance with Section 522, Duplex Coating System. The post and slip base shall be constructed as shown on the plans.

Subsection 614.13 shall include the following:

Pedestrian Push Button Post Assembly will be measured as the actual number that are installed and accepted.

614.14 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Pedestrian Push Button Post Assembly	Each

Wiring will not be measured and paid for separately but shall be included in the work.

-1-

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

Section 625 of the standard specifications is hereby revised as follows:

Delete section 625 and replace with the following:

DESCRIPTION

625.01 This work consists of the construction surveying, calculating, and staking necessary for the construction of all elements of the project. The work shall be done under the supervision of a Professional Land Surveyor (PLS) who is licensed in the State of Colorado.

Locating, preserving, referencing, installing and restoring land monuments such as Primary Control monuments from which the Right of Way or any land boundary will be calculated, described or monumented, Public Land Survey System (PLSS) monuments, General Land Office (GLO) monuments, Bureau of Land Management (BLM) monuments, Mineral Survey (MS) monuments, Right of Way (ROW) monuments, property boundary monuments and offsets, range points, benchmarks, easement monuments, and other monuments that are required by law or regulation to be established by a PLS, and the determination of any land boundary, shall be done under the supervision of a Professional Land Surveyor (PLS) who is licensed in the State of Colorado.

MATERIALS AND EQUIPMENT

625.02 The Contractor shall furnish all personnel, survey equipment, safety equipment, materials, and traffic control necessary to perform the required construction surveying and staking. All surveying equipment, including Electronic Distance Meters (EDM), total stations, theodolites, levels, rods, tapes, tripods, tribrachs, and Global Positioning System (GPS) receivers and equipment.

If any survey equipment is found to be functioning outside the manufacturer's specified tolerance, certification from an approved repair facility showing that the instruments have been repaired, properly adjusted, or both if necessary shall be included in the survey records and submitted to the City Surveyor's Office before being used.

CONSTRUCTION REQUIREMENTS

625.03 A Construction Survey Conference shall be held with the City Surveyor's Office prior to performing any surveying work under this section. The Contractor's Surveyor (PLS) and Party Chief shall attend. A Construction Survey Checklist shall be completed and signed by the City Surveyor's Office and the contractor.

The Contractor shall check and verify all established Primary horizontal and vertical control points.

All survey records generated shall be the property of the City and shall be available to the City Surveyor's Office for inspection or reproduction at all times. All survey records shall be transmitted to the City Surveyor's Office for inclusion into the project records before final project acceptance.

-2-

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

Electronic formats may be acceptable, please coordinate with the City Surveyor's Office. Copies of any new Monument Records filed by the PLS with the State Board of Registration shall be submitted to the City Surveyor prior to filing.

625.04 Contractor Surveying. The Contractor's PLS shall perform all construction surveying and staking that is necessary for construction of the project.

625.05 Staking. It is the responsibility of the Contractor's PLS to adhere to industry standards and acceptable practices in regards to staking. Any restaking will be the responsibility of the Contractor's PLS at no cost to the City.

625.06 Accuracy and Tolerances. It is the responsibility of the Contractor's PLS to adhere to industry standards and applicable standards with regard to horizontal and vertical accuracy tolerances.

625.07 Responsibility and Inspection. Supervision and coordination of construction surveying and staking is the Contractor's responsibility. The City Surveyor's Office or Engineer may inspect the Contractor's surveying; however such inspection will not relieve the Contractor of any responsibility for accuracy or completeness of work. All Contractor surveying inaccuracies, errors, or omissions shall be corrected at the Contractor's expense.

625.08 Reset Monuments and Stakes. Survey monuments, benchmarks, and other significant stakes that are damaged, destroyed, or made inaccessible by the progress of construction shall be replaced, transferred or reestablished at the Contractor's expense.

Locating, preserving, referencing, installing and restoring land monuments as described in 625.01, shall be done in accordance with Section 629, under the supervision of a PLS who is experienced and competent in Right of Way and boundary surveying and licensed in the State of Colorado.

625.09 Changes. All changes in lines and grades required by field conditions and all discrepancies in grades, alignment, location or dimensions detected by the Contractor shall be immediately submitted to the Engineer in writing. No changes in given data or plans will be allowed unless approved by the Engineer in writing. All changes shall be documented by the contractor.

625.10 Pay Quantities Measurements. The Engineer will perform all interim and final measurements deemed necessary by the City to determine contract pay quantities. The Contractor shall establish and maintain Control points and stationing as required for these measurements.

625.11 Survey Records. Survey records shall be completed as the work is done. Field survey notes for construction surveying and checking by the Contractor shall be recorded in survey records in conformance with industry standards and acceptable practices.

All survey records generated shall be the property of the City and shall be available to the City Surveyor's Office or the Engineer for inspection or reproduction at all times. All survey records shall be transmitted to the City Surveyor's Office for inclusion into the project records before

-3-

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

final project acceptance. All survey records shall be stamped with the seal of, and signed by, the responsible PLS.

Electronic submittal of survey records may be acceptable, please coordinate with the City Surveyor's Office.

METHOD OF MEASUREMENT

625.12 Construction surveying will not be measured but will be paid for on a lump sum basis.

BASIS OF PAYMENT

625.13 Payment for construction surveying will be the contract lump sum bid and will be full compensation for all surveying work necessary to complete the project to include all resetting of stakes, marks, monuments and preparing survey documentation as required.

Partial payment for construction surveying, as determined by the Engineer, will be made as the work progresses.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Surveying	Lump Sum

Traffic control for construction surveying will be measured and paid for in accordance with Section 630.

-1-

**REVISION OF SECTION 629
SURVEY MONUMENTATION**

Section 629 of the Standard Specifications is hereby deleted and replaced with the following:

DESCRIPTION

629.01 This work consists of locating, preserving, referencing, installing and restoring the following types of land monuments by a Colorado-licensed Professional Land Surveyor (PLS). The following types of monuments, if required, shall be considered included: Primary Control monuments from which Right of Way (ROW) or any land boundary will be calculated, described or monumented; Public Land Survey System (PLSS) monuments; General Land Office (GLO) monuments; Bureau of Land Management (BLM) monuments; Mineral Survey (MS) monuments; ROW monuments; property boundary monuments; and offsets, City of Denver range points, benchmarks, easement monuments, and other monuments that are required by law or regulation to be established by a PLS, along with installing or adjusting Monument Boxes. The monuments include, but are not limited to, those monuments identified on the Survey Control Perpetuation Diagram.

The production of additional documentation may be required by the City Surveyor's Office. All such work included in this section shall be performed under the supervision of a Colorado-licensed PLS.

MATERIALS AND EQUIPMENT

629.02 The Contractor shall furnish all personnel, survey equipment, safety equipment, materials and traffic control necessary to perform the required Monumentation and related surveying.

CONSTRUCTION REQUIREMENTS

629.03 A construction survey conference shall be held with the City Surveyor's Office prior to performing any surveying work under this section. The Contractor's Surveyor (PLS) and party Chief shall attend. A construction survey checklist shall be completed and signed by the City Surveyor's Office and the Contractor.

The Contractor shall check and verify all established primary horizontal and vertical control points.

All survey records generated shall be the property of the City & County of Denver and shall be available to the City Surveyor's Office for inspection or reproduction at all times. All survey records shall be transmitted to the City Surveyor's Office for inclusion into the project records before final project acceptance.

Electronic formats may be acceptable; please coordinate with the City Surveyor's Office.

Copies of any new Monument Records filed by the PLS with the State Board of Registration shall be submitted to the City Surveyor prior to filing.

629.04 Locating Monuments – This work consists of field locating all survey Monumentation as discussed in 629.01 which are in place within the project limits or as identified on the Survey

**REVISION OF SECTION 629
SURVEY MONUMENTATION**

Control Perpetuation Diagram. A diligent search of construction zones and project limits shall be performed by the PLS.

629.05 Preserving and Referencing Monuments – All monuments as described in 629.01 shall be preserved, referenced and reset by a PLS within the project limits or as identified on the Survey Control Perpetuation Diagram.

629.06 Installing Monuments – All monuments described in 629.01 shall be preserved throughout construction. If any monuments as described in 629.01 are to be disturbed or removed during construction, it will be the responsibility of the Contractor’s PLS to reset all monuments to current City & County of Denver standards. Appropriate documentation will be required for all reset monuments.

629.07 Monument Box – If required, this work shall consist of installing or adjusting monument boxes to current City or CDOT requirements.

METHOD OF MEASUREMENT

Survey monuments, monument boxes and adjustment of monument boxes will be measured by the actual number of the various types installed and accepted by the Engineer. Measurement for locating survey monuments, preserving and referencing monuments will not be measured and paid for separately.

BASIS OF PAYMENT

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Survey Monument (Type 1)	Each

Prior to payment, all survey records and documentation must be submitted and accepted by the City Surveyor’s Office.

The construction survey checklist, equipment calibrations and survey records will not be paid for separately but shall be included in the work. The locating of monuments, and preserving and referencing monuments will not be paid for separately but shall be included in the work.

-1-

**REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL**

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.01 shall include the following:

This work includes furnishing, operating, and maintaining a portable message sign panel.

Add subsection 630.031 immediately following subsection 630.03 as follows:

630.031 Portable Message Sign Panel. Portable message sign panel shall be furnished as a device fully self-contained on a portable trailer, capable of being licensed for normal highway travel, and shall include leveling and stabilization jacks. The panel shall display a minimum of three - eight character lines. The panel shall be a dot-matrix type with an LED legend on a flat black background. LED signs shall have a pre-default message that activates before a power failure. The sign shall be solar powered with independent back-up battery power. The sign shall be capable of 360 degrees rotation and shall be able to be elevated to a height of at least five feet above the ground measured at the bottom of the sign. The sign shall be visible from one-half mile under both day and night conditions. The message shall be legible from a minimum of 750 feet. The sign shall automatically adjust its light source to meet the legibility requirements during the hours of darkness. The sign enclosure shall be weather tight and provide a clear polycarbonate front cover.

Solar powered message signs shall be capable of operating continuously for 10 days without any sun. All instrumentation and controls shall be contained in a lockable enclosure. The sign shall be capable of changing and displaying sign messages and other sign features such as flash rates, moving arrows, etc.

Each sign shall also conform to the following:

2. In addition to the onboard solar power operation with battery back-up, each sign shall be capable of operating on a hard wire, 100-110 VAC, external power source.
3. All electrical wiring, including connectors and switch controls necessary to enable all required sign functions shall be provided with each sign.
4. Each sign shall be furnished with an operating and parts manual, wiring diagrams, and trouble-shooting guide.
5. The portable message sign shall be capable of maintaining all required operations under Colorado mountain-winter weather conditions.
6. Each sign shall be furnished with an attached license plate and mounting bracket.
7. Each sign shall be wired with a 7-prong male electric plug for the brake light wiring system.

Subsection 630.13 shall include the following:

The portable message sign panel shall be on the project site prior to the start of active roadway construction. Maintenance, storage, operation, relocation to different sites during the project, and all repairs of portable message sign panels shall be the responsibility of the Contractor.

-2-

**REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL**

Subsection 630.15 shall include the following:

Portable message sign panels will be measured one of the two following ways:

1. By the actual number of days each portable message sign is used on the project as approved by the Engineer.
2. By the maximum number of approved units in use on the project at any one time.

Subsection 630.16 shall include the following:

Pay Item	Pay Unit
Construction Traffic Control	LS

**REVISION OF SECTION 630
UNIFORMED TRAFFIC CONTROL**

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.09 shall include the following:

Uniformed Officers - The Contractor shall employ off-duty police officers to provide traffic control and traffic enforcement throughout the project as required by the Project Manager. Authorization must be made by the Project Manager in advance of working arrangements for Uniformed Traffic Control. Contact the Denver Police Department, Office of Secondary Employment for obtaining an off-duty police officer. Give this office at least 48 hours notice:

Analisa Ortiz

Phone Number: (720) 337-0775

Email: Analisa.ortiz@denvergov.org

Subsection 630.14 shall include the following:

The quantity to be measured for Uniformed Traffic Control will be the total number of hours that Uniformed Traffic Control is actually used as authorized.

Subsection 630.15 shall include the following:

The accepted number of hours of Uniformed Traffic Control will be paid for at the contract unit price per hour.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Uniformed Traffic Control	HR

-1-

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

Section 630 of the Standard Specifications is hereby revised as follows:

Subsection 630.01 shall be revised to include the following:

The Contractor shall submit, in writing, the proposed Method of Handling Traffic (MHT) for review and approval of the Project Engineer. The MHT shall be developed according to this section and the construction plans.

Subsection 630.05 TRAFFIC CONES shall include the following:

Steel drum channelizing devices shall not be used for traffic control

Subsection 630.06 shall include the following:

Non-metallic drums or tubular markers may be substituted for vertical panel channelizing devices.

Subsection 630.10(a), shall include the following:

When a different MHT is required for a subsequent construction phase, it must be submitted at least two weeks prior to starting that phase. All proposed methods of handling traffic shall be approved, in writing, by the Project Engineer following approval of the Traffic Engineering Services Department.

Approval of the proposed MHT does not relieve the Contractor of liability specifically assigned to him under the contract. The Contractor shall erect and maintain warning lights, signs, barricades, and sufficient safeguards around all excavations, embankments, and obstructions.

The contractor shall notify the Project Engineer by Thursday at 3:00 P.M. which streets they intend to work on the following week. This notification will be made for all phases of construction.

Subsection 630.10(a) shall be added as follows:

The key elements of the Contractor's method of handling traffic (MHT) are outlined in subsection 630.10(a).

The components of the Traffic Control Plan (TCP) for this project are included in the following:

- Subsection 104.04 and Section 630 of the Standard Specifications.
- Tabulation of Traffic Engineering Items included in the plans for this project.
- Latest revised Standard Plan S-630-1, Traffic Controls for Highway Construction and Standard Plan S-630-2, Barricades, Drums, Concrete Barriers (Temp), and Vertical Panels.

-2-

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

Special Traffic Control Plan requirements for this project are as follows:

1. During the construction of this project, traffic shall use the present traveled roadway.
2. Work that interferes with traffic will only be permitted during the following hours:
 1. The Contractor shall perform all the work on the roadway between the hours of 8:30 AM and 3:30 PM or as approved by the Project Engineer. Weekend and nighttime work will be allowed with the prior written approval of the Project Engineer. During this time, only one lane can be closed in each direction.
 2. Work will not be permitted that directly or indirectly interferes with the flow of traffic between the hours of 5:30 AM and 8:30 AM Monday through Friday; between the hours of 3:30 PM to 6:30 PM Monday through Thursday; and after 2:00 PM on Fridays unless otherwise authorized by the Project Engineer.
 3. No work on Holidays.
 4. Contractor shall not close lanes during special events.
 5. Contractor shall coordinate lane closures with adjacent projects.
 6. Contractor shall maintain business access during business hours.
 7. The Contractor shall coordinate all of the work on the roadway during any special event with the City and County of Denver.
 8. Coordinate with RTD per the plans.
3. The Contractor shall install construction traffic control devices where they do not block or impede other existing traffic control devices or sidewalks for pedestrians, disabled persons or bicyclists. The Contractor is restricted from storing any materials, construction traffic control devices, signs, etc. in any median area or park area.
4. Vertical cuts or fills greater than 1 inch resulting from construction operations adjacent to traffic lanes, or within the clear zone shall be temporarily sloped at a 6:1 or flatter slope, and delineated at 35 foot intervals immediately after removal operations to safeguard the traveling public.
5. Construction equipment used on this project shall meet the same minimum exhaust requirements as those specified by the manufacturer of the equipment.
6. The Contractor and subcontractors shall equip their construction vehicles with flashing amber lights. Equipment to be used at night shall also be equipped with flashing amber lights. Flashing amber lights on vehicles and equipment shall be visible from all directions.
7. The Contractor shall maintain access to all roadways, side streets, walkways, alleyways, driveways, and hike/bike paths at all times unless otherwise directed by the Engineer. Parking areas temporarily disturbed by construction activities shall be restored to a useable condition during non-working hours. Such temporary parking shall utilize an all-weather surface. The Contractor shall develop an Access Maintenance Plan in coordination with, and based on the requirements of, the affected property owners and tenants, and submit it to the Engineer for approval prior to commencement of work. This plan shall detail all barricades, ramps, signs, and temporary means of access required by the property owners or tenants. Prior to commencing any

-3-

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

work which affects access to a property, the Access Maintenance Plan for that property must be submitted and approved by the Engineer.

8. The Access Maintenance Plan shall be coordinated with all affected owners and tenants. The Access Maintenance Plan shall include documentation of this coordination, including the approval signature of each affected owner or tenant. Should the Contractor be unable to obtain approval and signatures, documentation of the efforts made to obtain said approval and signatures must be submitted. All access shall be maintained on surfaces equal to or better than those existing at the time the access is first disturbed. For short periods of time only as allowed by the Engineer, access may be maintained on aggregate base course surfaces.
9. The Contractor shall maintain continuous access throughout the project for pedestrians, bicyclists, and disabled persons. When the existing access route is disturbed by construction, a temporary all-weather access shall be provided. All temporary access shall be a minimum of 5 feet wide and meet Americans with Disabilities Act (ADA) requirements. Acceptable all weather surfacing shall be concrete or asphalt surface, or as approved by the Engineer. Delineation of pedestrian access through the work area shall be accomplished using temporary plastic fencing.
10. The costs of maintaining access will not be paid for separately, unless otherwise provided, but shall be included in the work. Utilization of materials to be incorporated into the work may be permitted. However, any degradation or other contamination or destruction shall be corrected at the Contractor's expense prior to acceptance.
11. During non-construction periods (evenings, weekends, holidays, etc.) all work shall be adequately protected to insure the safety of vehicular and pedestrian traffic, as detailed in the Contractor's MHT. Excavations or holes shall be filled in or fenced when unattended.
12. Whenever the Contractor removes, obliterates, or overlays any pavement markings, he /she shall replace them on a daily basis prior to opening the affected areas to traffic. All temporary pavement markings shall fully comply with the Standard Specifications and Special Provisions.
13. The Contractor shall not have construction equipment or materials in the lanes open to traffic any time unless directed by the Engineer.
14. All personal vehicle and construction equipment parking is prohibited where it conflicts with safety, access, or the flow of traffic. Landscaped areas, public park areas, and roadway shoulders shall be kept clear of parking and storage of all personal and construction equipment except where approved by the Engineer.
15. The Contractor shall not place tack coat on any surface to be paved where traffic will be forced to travel upon fresh bituminous materials.
16. The Contractor shall be required to make arrangements with the Regional Transportation district (RTD) prior to closing any existing bus stops within the project limits. Temporary stops will be required as directed by the Engineer and as required by RTD. For bus stop/route conflicts Regional Transportation District, RTD / 1560 Broadway, Suite 700, Denver, CO 80202 shall be contacted two business days prior to start of construction.

-4-

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

17. The Contractor shall be required to maintain temporary drives at any existing establishment that has singular access off of the roadways, unless otherwise approved in writing by the property owner.
18. No work that interferes with traffic will be allowed on holidays or any day of a three-day or four-day weekend that includes a holiday. Holidays on which this restriction applies consist of those holidays recognized by the State of Colorado as listed in subsection 101.36
19. All lane closures shall be subject to the approval of the Engineer. Request for each closure shall be made at least 24 hours in advance of the time the lane closure is to be implemented. Lane closures will not be allowed to remain unless being utilized in continuum for the intended purpose for which they were set up.
20. During no-working hours, the roadways shall be restored to a safe travel conditions for the free flow of traffic. Any maintenance required restoring the roadways to this condition, including the pavement patching and grading, shall be done prior to opening the areas to traffic or completing work for the day.
21. The Contractor shall clean the roadway of all construction debris before opening it to traffic.
22. All flagging stations used at night shall be illuminated with floodlights. Street, highway lights and “high mast lighting” may be used for flagging station illumination when approved by the Engineer. Floodlights shall be located and directed so as not to interfere with the sight of any motorists, and the cost to be included in the work.
23. Prior to removal and resetting of any sign the Contractor and Engineer shall prepare an inventory. Any signs damaged due to the Contractor’s operations shall be replaced in kind or repaired by the Contractor at no additional cost to the project.
24. Unless noted otherwise, all costs incidental to the foregoing requirements shall be included in the original contract prices for the project, including any additional traffic control items required for haul routes into the project.

Subsection 630.10 (10) shall be added as follows:

Number of hours for uniformed traffic control shall be tabulated for submittal.

Subsection 630.10 (11) shall be added as follows:

Contractor shall obtain all required access and construction permits from the City & County of Denver prior to initiating work along City right of way.

All lane closures require an arrow board to be installed.

All streets that will be reduced in the number of travel lanes should have variable message boards installed for a minimum of 3 days after the striping change to inform drivers of the lane reduction.

-5-

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

Subsection 630.14 shall include the following:

The flagger's STOP/SLOW sign paddle shall be 18 inches with letters six inches high.

Subsection 630.15 is hereby deleted and replaced with the following:

The Contractor shall furnish all other personnel – including flaggers, traffic control inspector, and traffic control supervisor - and other materials necessary to perform the Construction Zone Traffic Control as required and these quantities will not be measured but will be included in the cost of Traffic Control Management.

Temporary pavement markings for traffic control will not be measured and paid for separately, but shall be included in the work.

Subsection 630.16 is hereby deleted and replaced with the following:

All costs incidental to maintenance of access will not be paid for separately, unless otherwise provided, but shall be included in the work.

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

Payment will be made under:

Pay Item

Construction Traffic Control

Pay Unit

LS

FORCE ACCOUNT ITEMS

DESCRIPTION

This Special Provision contains the City and County of Denver's estimate for Force Account Items included in the Contract. The estimated amounts will be added to the total bid to determine the amount of the performance and payment bonds. Force Account work shall be performed as directed by the Engineer.

BASIS OF PAYMENT

Payment will be made in accordance with Subsection 109.04. Payment will constitute full compensation for all work necessary to complete the item.

Force Account work valued at \$5,000 or less that must be performed by a licensed journeyman in order to comply with federal, state, or local codes, may be paid for after receipt of an itemized statement endorsed by the Contractor.

<u>Item No.</u>	<u>Force Account Item</u>	<u>Quantity</u>	<u>Estimated Amount</u>
F/A 01	Furnish & Install Electrical Service	F/A	\$19,780
F/A 02	Environmental Health and Safety	F/A	\$5,000

Force Account descriptions include:

F/A 01 Furnish and Install Electrical Service – This force account is for all cost charges from the power service provider, and all necessary materials, labor and coordination required to maintain existing or establish new power sources required for permanent operation of equipment as shown in the plans.

F/A 02 Environmental Health and Safety- This work is described in Section 250 – Environmental, Health, and Safety Management of the Standard Specifications.

-1-
UTILITIES

Known utilities within the limits of this project are:

UTILITY CONTACT LIST

Utility Owner	Contact Name/Email	Phone/Fax
CenturyLink & Level 3	Jim Elkins James.Elkins@CenturyLink.com Thomas Longan thomas.longan@centurylink.com	720-545-6037 (Jim) 303-482-9822 (Tom)
Comcast	Kip West Kip_West@comcast.com	303-603-2832 (Office) 720-347-9992 (Cell)
Denver Public Works Transportation & Mobility Fiber Optic	Chad Tavelli chad.tavelli@denvergov.org	720-448-6700 (Cell) 303-827-4472 (Work Cell) 720-377-2914 (Office)
Denver Public Works Transportation & Mobility Traffic	Amy Rens Amy.Rens@denvergov.org	720-865-3177
Denver Public Works Wastewater Management Division	Todd Johnson Todd.Johnson2@denvergov.org	(720) 865-3120 (Office) (503) 482-8633 (Cell)
Denver Water	Paul Peloquin paul.peloquin@denverwater.org Ray Batts Rapheal.Batts@denverwater.org	303-628-6620 (Paul) 303-628-6682 (Ray)
MCI-Verizon Fiber	Steve Valdez (Engineer - West Field Engineering - CO) steve.g.valdez@one.verizon.com David McCallister (Engineer - West Field Engineering - CO) david.mcallister@one.verizon.com Greg Fritz (Engineer - West Field Engineering - CO) greg.fritz@one.verizon.com <i>(Note: Contact the above three contacts for MCI, Verizon, and XO utilities)</i>	303-539-1022 (Steve, Cell) 303-435-2793 (Steve, Office) 303-214-7115 (David, Office) 801-301-0937 (David, Cell) 303-539-3238 (Greg, Office) 303-961-3140 (Greg, Cell)
Metro Wastewater Reclamation District	Jim Malloreay JMalloreay@mwr.dst.co.us	303-286-3487 (Office) 303-549-8397 (Cell)
Xcel Energy (Electric & gas)	Mickie Ford Michelle.Ford@XCELENERGY.COM	303-898-8001 (Office)
Zayo Group	Jeramie Trotter jeramie.trotter@zayo.com	406-209-7259
Note: Updated on 09/17/2019		

The work described in these plans and specifications will require full cooperation between the Contractor and the utility companies, in accordance with Subsection 105.11, in conducting their respective operations so the utility work can be completed with minimum delay to all parties concerned.

-2-

UTILITIES**PART 1 - CONTRACTOR SHALL PERFORM THE WORK LISTED BELOW:**

The Contractor shall be responsible for coordinating the adjustment and/or relocation of all utilities on this project, per the plans and specifications, and as directed by the Engineer. Also, in accordance with the plans and specifications and as directed by the Engineer, the Contractor shall keep the utility company(s) advised of any work being done to their facility so that the utility company(s) can coordinate their inspections for final acceptance of the work with the Engineer.

Contractor shall locate and pothole all potential conflicts with existing buried utility facilities with the proposed construction, as shown on the plans or by field location markings. If a conflict exists, modify proposed construction plans to avoid all existing buried utility facilities as approved by the Engineer.

The Contractor shall coordinate project construction with the performance by the utility owner of each utility work element listed in Part 2 below. Perform preparatory work specified in Part 2 for each utility work element. For all utilities other than Xcel Energy, the following procedure applies:

Provide an accurate construction schedule that includes all utility work elements to the owner of each impacted utility. Provide each utility owner with periodic updates to the schedule. Conduct necessary utility coordination meetings, and provide other necessary accommodations as directed by the Engineer. Notify each utility owner in writing, with a copy to the Engineer, prior to the time each utility work element is to be performed by the utility owner. Provide notice equal to the number of days specified in Part 2 immediately prior to the time the utility work must be begun to meet the project schedule.

For Xcel Energy, the following procedure applies:

At the pre-construction meeting, notify the Engineer of schedule requirements for completion of utility work as specified in Part 2. Based upon scheduling needs, the Manager of Public Works will send a Work Request to Xcel Energy per the Franchise Agreement between the City and County of Denver and Public Service Company of Colorado, and the related Operating Agreement and Street Lighting Agreement (collectively known as the "Franchise Agreements"). Typically, this work request would have been sent to Xcel Energy during the design phase of the project. Referring to Relocation of Xcel Energy Facilities, Section 5.7 of the Franchise Agreement states that "The relocations set forth in Section 5.7.A of the franchise shall be completed within a reasonable time, not to exceed ninety (90) days from the date on which the Manager of Public Works requests, in writing, that the relocation commence."

In reference to new/modified service to City facilities (i.e., power supply, removal or installation of poles, etc.), Section 5.3 of the Operating Agreement states: "The company (Xcel Energy) shall complete each project requested by the City within a reasonable time. The Parties agree that for Traffic Facilities, a reasonable time shall not exceed one hundred twenty (120) days from the date upon which the Manager of Public Works makes a Work Request and for all other City Facilities a reasonable time shall not exceed one hundred eighty (180) days from the date upon which the Manager of Public Works makes a Work Request." When requesting that the City initiate a Work Request to Xcel Energy, the Contractor should consider the time limits contained in the Franchise Agreements.

Xcel Energy – Street Lighting and Electric Distribution Work Elements:

The Contractor shall be responsible for the coordination of power source work to be performed by Xcel Energy. The Contractor shall coordinate all traffic signal-light pole installations and power source

-3-
UTILITIES

connections, including any removals with Xcel Energy forces. The Contractor shall submit the materials list, with locations, for the proposed traffic signal poles for review and approval by Xcel Energy forces.

The Contractor shall coordinate with Xcel Energy to ensure that new electric lines including service lines are installed in locations that are compatible with proposed improvements. It shall be the contractor's responsibility to protect all Xcel Energy facilities within the area of construction. This includes all steps necessary to prevent subsidence of the soil adjacent to or near Xcel Energy facilities

Notify the utility owner in writing 5 days immediately prior to required inspections of utility work performed by the contractor.

Denver Traffic Operations:

The Contractor shall be responsible for relocating and adjusting the Denver Traffic fiber interconnect, handholes, cabinets and manholes as shown in the plans, including all fiber splicing and terminations. The Contractor shall coordinate with Denver Traffic regarding the relocated placement of any equipment. Traffic signal communication shall be maintained by the Contractor throughout construction. Any fiber optic cables that are disconnected by the Contractor shall be re-connected within 48 hours using the fiber diagrams furnished by the City.

The Contractor shall be responsible for field coordinating signal pole locations with Denver Traffic forces prior to ordering materials.

The Contractor shall coordinate all work and required inspections with Denver Traffic forces.

Denver Wastewater:

The Contractor shall adjust and/or modify all existing sanitary manhole rims to the proposed finished grade including those noted on the plans.

The Contractor shall coordinate inspections with Denver Wastewater. The Contractor shall provide the utility owner written notice 5 days immediately prior to required inspections.

Metro Wastewater Reclamation District (MWRD):

The Contractor shall adjust and/or modify all existing sanitary manhole rims to the proposed finished grade including those noted on the plans.

It is the responsibility of the contractor to examine the site for evidence of failures of or deficiencies in Metro Wastewater Reclamation District (MWRD) facilities and to immediately call any such evidence of pre-existing damage to the attention of the MWRD along with proper documentation.

Without such evidence of pre-existing damage, the contractor hereby agrees that any and all damages (direct or indirect) to MWRD facilities, which may be subsequently discovered within those areas where construction occurred within six feet of MWRD facilities (direct or indirect) and within a period of three years from the date of construction, were caused by the construction activities. Furthermore, their repair is agreed to be the sole responsibility of the contractor.

-4-
UTILITIES

It shall be the contractor's responsibility to protect all MWRD facilities within the area of construction. This includes all steps necessary to prevent subsidence of the soil adjacent to or near MWRD facilities

Coordinate all required inspections with MWRD forces.

Notify the utility owner in writing 5 days immediately prior to required inspections of utility work performed by the Contractor.

CenturyLink:

The Contractor shall coordinate with CenturyLink regarding the work to be completed by CenturyLink and shall notify CenturyLink two months prior to construction for all work as described in Part 2.

PART 2—UTILITY OWNERS SHALL PERFORM THE WORK LISTED BELOW:

Although the Contractor shall provide traffic control for utility work expected to be coordinated with construction, traffic control for utility work outside of typical project work hours shall be the responsibility of the utility owner. The utility owner shall prepare and submit to the Engineer a Method of Handling Traffic for utility work to be performed outside typical project work hours. The utility owner shall obtain acceptance of the Method of Handling Traffic from the Engineer prior to beginning the utility work to be performed outside typical project work hours.

All Utility Owners:

Contractor shall locate and pothole all potential conflicts with existing buried utility facilities with the proposed construction, as shown on the plans or by field location markings. If a conflict exists, modify proposed construction plans to avoid all existing buried utility facilities as approved by the Engineer.

Contractor shall contact utility owners 5 days prior to potholing to allow their observation of potholing activities.

Utility owners are responsible for obtaining all necessary permits from the City and County of Denver, as required.

Xcel Energy – Electrical Distribution:

The Contractor shall be responsible for the coordination of relocation and removal work to be performed by Xcel Energy. The Contractor shall contact the Xcel Energy Builder's Call Line at 1-800-628-2121 to request, and process to completion, required coordination for new or relocated electric facilities that are compatible with the proposed improvements as shown on the plans.

This work is expected to be coordinated with the construction.

Denver Traffic Operations:

Denver Traffic Operations shall inspect the work completed by the Contractor listed in Part 1 above.

-5-
UTILITIES

Denver Wastewater:

Denver Wastewater shall inspect utility work performed by the Contractor listed in Part 1 above. The Contractor shall provide the utility owner written notice 5 days immediately prior to each required inspection.

Metro Wastewater Reclamation District (MWRD):

Metro Wastewater Reclamation District (MWRD) shall inspect utility work performed by the Contractor listed in Part 1 above. The Contractor shall provide the utility owner written notice 5 days immediately prior to each required inspection.

CenturyLink:

CenturyLink shall abandon, remove, or relocate its buried facilities near the locations of the proposed traffic signal poles, pullboxes, and other buried proposed facilities. This work is expected to be coordinated with the construction and take 30 days to complete.

SPECIAL CONSTRUCTION REQUIREMENTS
TRAFFIC SIGNAL INSTALLATION
PERSONNEL
REQUIREMENT

The Contractor shall adhere to the following requirements regarding Traffic Signal construction and maintenance personnel. Current Certificates showing qualifications shall be submitted at the pre- construction meeting.

- (1) For any work inside the traffic signal cabinet, Signal and Signal Bench Technician shall be minimum IMSA Level II certified. This includes the completion of training in construction, corrective maintenance, and signal turn-on.
- (2) For all work external to the signal cabinet, a minimum IMSA Level I Traffic Signal Field Technician/Electrician or Traffic Signal Bench Technician/Signal Technician is required. An IMSA Level II Traffic Signal Electrician shall be on the job site at all times that signalization work is taking place to ensure proper construction. A maximum ratio of four IMSA Level I to one IMSA Level II will be allowed for work external to the signal cabinet.

The United States Department of Labor – Bureau of Apprenticeship and Training may be substituted for the IMSA Level I Traffic Signal Electrician requirement.

CITY AND COUNTY OF DENVER
STATE OF COLORADO



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

Plans/Drawings

Contract Number: 201952606



Yale Station Pedestrian Safety

November 19, 2019

PoDI/NHS	
FHWA PROJECT OF DIVISION INTEREST (PoDI)?	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES
NATIONAL HIGHWAY SYSTEM?	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES

CITY AND COUNTY OF DENVER DEPARTMENT OF PUBLIC WORKS TRANSPORTATION DESIGN

RELATED PROJECTS:
P.E. UNDER PROJECT: N/A
PROJECT NUMBER N/A
PROJECT CODE N/A

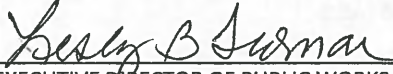
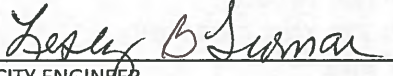

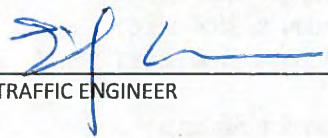
R.O.W. PROJECTS:
R.O.W. PROJECT DESCRIPTION
N/A

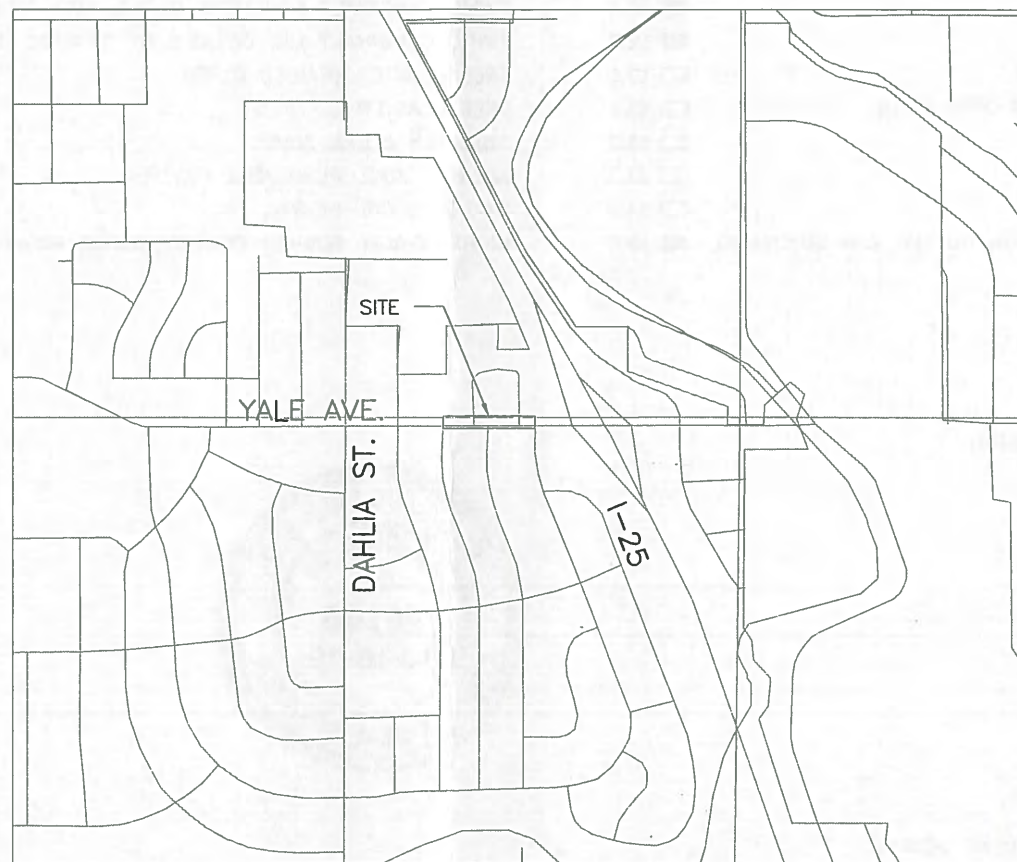
CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

PLANS OF PROPOSED
PROJECT NO. PO-00054216
2019-PROJMSTR-0000202

YALE STATION PEDESTRIAN SAFETY PROJECT

APPROVED BY:

	10.31.19
EXECUTIVE DIRECTOR OF PUBLIC WORKS	DATE
	10.31.19
CITY ENGINEER	DATE
	10/28/19
DIRECTOR OF ENGINEERING CAPITAL PROJECTS	DATE
	10/24/19
CITY TRAFFIC ENGINEER	DATE

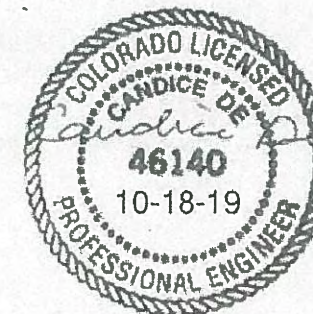


Vicinity Map -- Not to Scale

SHEET NO.	INDEX OF SHEETS
1	TITLE
2	CITY AND COUNTY OF DENVER STANDARD LEGEND AND KEY NOTES SHEET
3-7	GENERAL NOTES
8-9	SURVEY CONTROL DIAGRAM
10	SUMMARY OF QUANTITIES
11-14	TABULATIONS
15	DEMOLITION PLAN
16	ROADWAY PLAN
17	CURB RAMP DETAILS
18	MEDIAN DETAILS
19-20	SIGNAL PLAN
21	TRAFFIC CONTROL PLAN
22-23	UTILITY PLAN

DESIGN CRITERIA	
CLASSIFICATION	URBAN ARTERIAL
YALE AVE. POSTED SPEED LIMIT	30 MPH
DESIGN VEHICLE	SU-40

100% DESIGN SUBMITTAL
OCTOBER 18, 2019



Know what's below.
Call before you dig.

Print Date: 10/18/2019
File Name: G00-YAL-GN_TITLE01.dwg
Horiz. Scale: As Noted Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman

Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed

No Revisions:

Revised:

Void:

CONTRACT INFORMATION	
Contractor:	
Resident Engineer:	
Project Engineer:	
PROJECT STARTED:	ACCEPTED:
COMMENTS:	

Project Number
PO-00054216

Sheet Number 1

10/18/2019 8:11:31 AM C:\pwworkdir\dem003\cst2mhill_88074278\40418232\G00-YAL-GN_TITLE01.dwg



TRANSPORTATION ENGINEERING STANDARD DRAWINGS

TRAFFIC STANDARD DRAWINGS

NO.	DESCRIPTION
<input checked="" type="checkbox"/> 1.0	INDEX OF STANDARD DRAWINGS
<input checked="" type="checkbox"/> 1.1	LEGEND
<input type="checkbox"/> 2.0	LOCAL STREET CROSS-SECTION AND STANDARD UTILITY PLACEMENT DETAIL
<input type="checkbox"/> 3.0	COLLECTOR - 2 OR 3 LANE CROSS-SECTION
<input type="checkbox"/> 4.0	ARTERIAL - 4 LANE WITH MEDIAN AND NO PARKING CROSS-SECTION
<input type="checkbox"/> 4.1	ARTERIAL - 4 LANE WITH MEDIAN AND PARKING CROSS-SECTION
<input type="checkbox"/> 4.2	ARTERIAL - 6 LANE CROSS-SECTION
<input type="checkbox"/> 5.0	CURB & GUTTER AND DETACHED SIDEWALK
<input type="checkbox"/> 5.1	CURB & GUTTER AND ATTACHED SIDEWALK
<input checked="" type="checkbox"/> 5.2	TYPICAL CURB & GUTTER SECTIONS
<input type="checkbox"/> 5.3	SPECIAL USE CURB & GUTTER SECTIONS
<input type="checkbox"/> 5.4	CONCRETE GUTTER OVERLAY
<input type="checkbox"/> 5.5	CURB BULB EXTENSION
<input checked="" type="checkbox"/> 5.6	MONOLITHIC MEDIAN CURB NOSE
<input type="checkbox"/> 6.0	STANDARD RESIDENTIAL CURB CUT
<input type="checkbox"/> 6.1	STANDARD COMMERCIAL AND MULT-FAMILY CURB CUT
<input type="checkbox"/> 6.2	CURB CUT CROSS-SECTIONS
<input type="checkbox"/> 6.3	CORNER CLEARANCES & MINIMUM DISTANCES BETWEEN CURB CUTS
<input checked="" type="checkbox"/> 7.0a,b	GENERAL NOTES FOR CURB RAMPS
<input checked="" type="checkbox"/> 7.1	CURB RAMP TYPE 1
<input type="checkbox"/> 7.2a	CURB RAMP TYPE 2
<input type="checkbox"/> 7.2b	CURB RAMP TYPE 2 MODIFIED (FOR COMBINATION CURB, GUTTER AND SIDEWALK)
<input checked="" type="checkbox"/> 7.3	CURB RAMP TYPE 3
<input type="checkbox"/> 7.4	CURB RAMP TYPE 4
<input type="checkbox"/> 7.5	DOWNTOWN SIGNALIZED CORNER BLENDED TRANSITION
<input checked="" type="checkbox"/> 7.6a,b	CURB RAMP TRUNCATED DOME PLACEMENT OPTIONS
<input checked="" type="checkbox"/> 7.7	CURB RAMP TYPICAL SECTION
<input checked="" type="checkbox"/> 7.8	TYPICAL SIDEWALK TRANSITIONS TO CURB RAMP LANDING
<input checked="" type="checkbox"/> 7.9	SIGNAL EQUIPMENT CLEAR ZONE
<input type="checkbox"/> 8.0	INTERSECTION VALLEY GUTTER
<input type="checkbox"/> 8.1	SIDEWALK CHASE DRAIN AND TREAD PLATE
<input type="checkbox"/> 9.0	TYPICAL CONCRETE BUS PULLOUT
<input type="checkbox"/> 9.1	TYPICAL CONCRETE BUS PAD IN ASPHALT ROADWAY
<input type="checkbox"/> 10.0	TYPICAL ALLEY LAYOUT
<input type="checkbox"/> 10.1	ALLEY CUT
<input type="checkbox"/> 10.2	ALLEY CUT (HISTORICAL DISTRICT)
<input type="checkbox"/> 10.3	TYPICAL ALLEY CROSS-SECTION
<input type="checkbox"/> 10.4	ALLEY CURB HEAD
<input type="checkbox"/> 10.5	"L" TYPE ALLEY CONFIGURATIONS
<input checked="" type="checkbox"/> 11.0a,b,c	GENERAL NOTES FOR CONCRETE PAVEMENT AND PAVEMENT JOINTS
<input type="checkbox"/> 11.1	CONCRETE NON-ROADWAY JOINTS H AND Z
<input type="checkbox"/> 11.2	CONCRETE ROADWAY JOINTS AND TRANSITIONS A-D

NO.	DESCRIPTION
<input type="checkbox"/> 11.3	CONCRETE ROADWAY JOINTS AND TRANSITIONS DC-L
<input type="checkbox"/> 11.4	CONCRETE ROADWAY JOINTS AND TRANSITIONS SA-X
<input checked="" type="checkbox"/> 11.5	CONCRETE ROADWAY JOINT SEALANTS
<input type="checkbox"/> 11.6	CONCRETE ROADWAY JOINTING AT NEW MANHOLES AND ALL INLETS
<input type="checkbox"/> 11.7	CONCRETE ROADWAY JOINTING AT EXISTING MANHOLES
<input type="checkbox"/> 11.8	CONCRETE ROADWAY TYPICAL JOINT LAYOUT
<input type="checkbox"/> 11.9	CONCRETE ROADWAY PANEL REPLACEMENT
<input type="checkbox"/> 11.10	CONCRETE STREET EXPLORATORY HOLES (POTHOLES) TYPICAL REPAIR
<input checked="" type="checkbox"/> 12.0	ASPHALT PATCH
<input type="checkbox"/> 12.1	TRENCH PATCH THROUGH EXISTING GRAVEL OR LANDSCAPE MATERIALS
<input type="checkbox"/> 12.2	TRENCH VERTICAL PATCH (ASPHALT) IN MORATORIUM STREET
<input type="checkbox"/> 12.3	TRENCH ("T") PATCH (CONCRETE)
<input type="checkbox"/> 12.4	TRENCH BACKFILL MATERIAL REQUIREMENTS
<input checked="" type="checkbox"/> 12.5	TYPICAL ASPHALT PAVEMENT DETAIL
<input checked="" type="checkbox"/> 12.6	TYPICAL ASPHALT PAVEMENT DETAIL LIFT THICKNESS CRITERIA
<input checked="" type="checkbox"/> 12.7	TYPICAL ASPHALT MIX DETAILS BY TRAFFIC USE OR LIFT POSITION
<input type="checkbox"/> 12.0	TREE PLANTER (RAISED CURB)
<input type="checkbox"/> 13.1	TREE PLANTER (GRATES)
<input type="checkbox"/> 13.2	SIDEWALK CLEAR ZONES
<input type="checkbox"/> 13.3	AMENITY ZONE PERMEABLE PAVERS
<input type="checkbox"/> 14.0	STANDARD CUL-DE-SAC
<input checked="" type="checkbox"/> 15.0	RIGHT-OF-WAY SURVEY CONTROL-RANGE POINTS

NO.	DESCRIPTION
<input checked="" type="checkbox"/> 16.1.0	2011 TRAFFIC ENGINEERING SERVICES
<input checked="" type="checkbox"/> 16.1.1	TRAFFIC SIGNAL NOTES
<input checked="" type="checkbox"/> 16.1.2	LEGEND/KEY NOTES
<input type="checkbox"/> 16.1.3	SPAN WIRE SIGNAL DESIGN
<input checked="" type="checkbox"/> 16.1.4	MOUNTING HARDWARE
<input type="checkbox"/> 16.1.5	LOOP DETECTION
<input checked="" type="checkbox"/> 16.1.6	CONDUIT DETAILS
<input checked="" type="checkbox"/> 16.1.7	PULL BOXES
<input checked="" type="checkbox"/> 16.1.8	SIGNAL POLE FOUNDATION
<input checked="" type="checkbox"/> 16.1.9	MAST ARM POLE LOADS
<input checked="" type="checkbox"/> 16.1.10	MOUNTING DETAILS
<input checked="" type="checkbox"/> 16.1.11	TABLE DATA
<input checked="" type="checkbox"/> 16.1.12	LUMINAIRE DETAILS
<input type="checkbox"/> 16.1.13	PEDESTAL POLE DETAILS
<input checked="" type="checkbox"/> 16.1.14	POLE FOUNDATION DETAILS
<input checked="" type="checkbox"/> 16.1.15	FOUNDATIONS FOR XCEL FACILITIES
<input checked="" type="checkbox"/> 16.1.16	"P" CABINET BASE
<input checked="" type="checkbox"/> 16.1.17	"P" CABINET & BASE
<input type="checkbox"/> 16.1.18	"M" CABINET BASE
<input checked="" type="checkbox"/> 16.1.19	METER PEDESTAL CABINET DETAILS
<input checked="" type="checkbox"/> 16.1.20	METER PEDESTAL CABINET FOUNDATION AND BASE
<input type="checkbox"/> 16.1.21	FLASHING BEACON DETAILS
<input type="checkbox"/> 16.1.22	DRIVER'S FEEDBACK SIGN DETAILS
<input type="checkbox"/> 16.1.23	FLASHING BEACON & SIGN SHEET 1
<input type="checkbox"/> 16.1.24	FLASHING BEACON & SIGN SHEET 2
<input checked="" type="checkbox"/> 16.2.1	CROSSWALK LAYOUT DETAILS
<input checked="" type="checkbox"/> 16.2.2	PAVEMENT MARKING DETAILS SHEET 1
<input checked="" type="checkbox"/> 16.2.3	PAVEMENT MARKING DETAILS SHEET 2
<input type="checkbox"/> 16.2.4	BIKE LANE TYPICAL MARKING DETAILS
<input type="checkbox"/> 16.2.5	CENTRAL BUSINESS DISTRICT PAVEMENT MARKING DETAILS
<input checked="" type="checkbox"/> 16.2.6	SINGLE SIGN POST MOUNTING DETAILS
<input type="checkbox"/> 16.2.7	MULTIPLE SIGN POST MOUNTING DETAILS
<input type="checkbox"/> 16.2.8	ONE-WAY SIGN PLACEMENT DETAILS
<input type="checkbox"/> 16.2.9	TRAFFIC SIGN UTILITY POLE MOUNTING DETAIL
<input type="checkbox"/> 16.2.10	GROUND MOUNT STREET NAME SIGN INSTALLATION DETAIL
<input type="checkbox"/> 16.2.11	GROUND MOUNT STREET NAME SIGN DETAIL
<input type="checkbox"/> 16.2.12	OVERHEAD STREET NAME SIGNS (INSTALLED PRIOR TO APRIL, 2011)
<input checked="" type="checkbox"/> 16.2.13	OVERHEAD STREET NAME SIGNS (INSTALLED AFTER APRIL, 2011)
<input type="checkbox"/> 16.2.14	PARKING METER POST INSTALLATION
<input type="checkbox"/> 16.2.15	BARRICADE DETAILS



CITY AND COUNTY OF DENVER
STANDARD DRAWINGS LIST

9/20/2019 9:40:13 AM C:\pwworkdir\dem003\ch2mhill_s074278\0418232\G01-YAL-GN-DETL.dwg



Know what's below.
Call before you dig.

Print Date: 9/20/2019	
File Name: G01-YAL-GN-DETL.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	
JACOBS	

Sheet Revisions		
Date:	Comments	Init.

DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

YALE STATION		
CITY AND COUNTY OF DENVER		
STANDARD PLANS LIST		
Designer:	SAB	Structure Numbers
Detailer:	SAB	
Sheet Subset:	GENERAL	Subset Sheets: G01 of 6

Project Number	P0-00054216
Sheet Number	2

GENERAL NOTES

1. CONTRACTOR SHALL COMPLY WITH CDOT-PERSONAL PROTECTIVE EQUIPMENT. USE PROCEDURAL DIRECTIVE 80.1, WHICH WILL BE PROVIDED TO THE CONTRACTOR. THE CONTRACTOR SHALL MAKE EVERY REASONABLE EFFORT TO START ASSIGNED WORK WITHIN TWO WEEKS OF NOTIFICATION.
2. 10 DAYS PRIOR TO WORK COMMENCING, THE CONTRACTOR'S POTENTIAL POLLUTION REPORT-SPILL CONTINGENCY PREVENTION PLAN SHALL BE COPIED AND ATTACHED TO THE PLANS PER SECTION 107.25. VEHICLE CLEANING MAY OCCUR ON SITE, IN APPROVED AREAS, WHERE WASH WATER CAN BE CONTAINED, AND PROPERTY DISPOSED OF.
3. THERE SHALL BE NO STOCKPILING OR SIDE CASTING OF WASTE MATERIALS INCLUDING BUT, NOT LIMITED TO, PAINT CHIPS, ASPHALT, AND CONCRETE, ADJACENT TO ANY STATE WATERS THAT RESULT FROM PROJECT ACTIVITIES.
4. CONTAINMENT AND CLEAN UP OF EQUIPMENT FUEL, OIL, AND LUBRICANT LEAKS: CONTRACTOR SHALL INSPECT AND CERTIFY EQUIPMENT AND VEHICLES DAILY TO ENSURE PETROLEUM, OILS AND LUBRICANTS (POL) ARE NOT LEAKING ONTO THE SOIL OR PAVEMENT. ABSORBENT MATERIAL OR CONTAINERS APPROVED BY THE ENGINEER SHALL BE USED TO PREVENT LEAKING POL FROM REACHING THE SOIL OR PAVEMENT. CONTRACTOR SHALL HAVE READY APPROVED ABSORBENT MATERIAL OR CONTAINERS OF SUFFICIENT CAPACITY TO CONTAIN ANY LEAKING POL THAT CAN REASONABLY BE FORESEEN. ALL MATERIALS RESULTING FROM POL LEAKAGE CONTROL AND CLEANUP SHALL BE THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE SITE. THE COST FOR CONTROL AND CLEANUP OF POL LEAKS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
5. CONTRACTOR SHALL NEITHER STAGE NOR PARK EQUIPMENT AT ANY TIME OFF THE ROADWAY/SHOULDERS OR ON VEGETATED AREA, ON PRAIRIE DOG HOLES, OR WITHIN 100 FEET OF WATERWAYS. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR STAGING AREAS. CONTRACTOR SHALL COMPLETE WORK IN ONE LOCATION BEFORE THEY MOVE TO ANOTHER LOCATION. FOR GRINDING, THE CONTRACTOR SHALL USE GANG STACKED DIAMOND TIP BLADES AND HAVE A VACUUM MACHINE ON SITE TO CONTROL DUST AND SLURRY. THIS ITEM WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
6. THE CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE. LIMITS OF DISTURBANCE SHALL BE DETERMINED BY THE ENGINEER AND THE CONTRACTOR. ANY DISTURBANCES BEYOND THESE LIMITS SHALL BE RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. DISTURBANCES WITHIN THE LIMITS SHALL BE RESTORED BY THE CONTRACTOR AND SHALL BE INCLUDED IN THE COST OF THE WORK. CONSTRUCTION ACTIVITIES IN ADDITION TO NORMAL CONSTRUCTION PROCEDURE SHALL INCLUDE THE PARKING OF VEHICLES OR EQUIPMENT, DISPOSAL OF LITTER, AND ANY OTHER ACTION WHICH WOULD ALTER EXISTING CONDITIONS. ANY OFF-ROAD STAGING AREAS MUST BE PRE-APPROVED BY THE ENGINEER.
7. AT ANY IRRIGATED LANDSCAPES, NO OFF-ROAD PARKING, STAGING, OR WORK SHALL OCCUR UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL REPLACE ANY DAMAGED LANDSCAPE, INCLUDING GRASS, IRRIGATION SYSTEM COMPONENTS, TREES, SHRUBS AND GROUND COVERS TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. LANDSCAPE IMPACTS BETWEEN THE PROPOSED SIDEWALK AND THE ROW LINE/CONSTRUCTION FENCE WILL BE PAID UNDER LANDSCAPE MAINTENANCE. IMPACTS TO ANY OTHER AREA WILL BE AT CONTRACTOR'S EXPENSE. SOD SHALL MATCH EXISTING. THE CONTRACTOR SHALL COORDINATE WITH CITY AND COUNTY OF DENVER PERSONNEL AT LEAST FIVE (5) WORKING DAYS IN ADVANCE OF ANY DISTURBANCE IN THE AREA. NO LANDSCAPE SHALL BE WITHOUT WATERING SERVICES DURING THE GROWING SEASON. IF THE IRRIGATION SERVICE IS INTERRUPTED FOR MORE THAN THREE DAYS, THE CONTRACTOR SHALL BE LIABLE TO HAND/TRUCK WATER. IF IRREPARABLE DAMAGE TO LANDSCAPED AREAS OCCURS, CONTRACTOR WILL BE RESPONSIBLE FOR THE PLANT REPLACEMENT IN THE AFFECTED AREA. LANDSCAPE RESTORATION SHALL BE CONSIDERED COMPLETE WHEN THE LANDSCAPE AND IRRIGATION SYSTEM IS RESTORED TO ITS ORIGINAL CONDITION AND APPROVED BY THE MAINTAINING PERSONNEL. ALL REPAIR WORK, TO ANY IRRIGATION COMPONENTS, SHALL BE INSPECTED BY CITY AND COUNTY OF DENVER LANDSCAPE MAINTENANCE FORCES PRIOR TO BURIAL AND ACCEPTANCE OF SAID WORK.
8. ALL WORK IN THE CITY ROW SHALL MEET CCD TRAFFIC ENGINEERING STANDARDS, LATEST EDITION.
9. THE CONTRACTOR SHALL APPLY FOR A STREET OCCUPANCY PERMIT (INCLUDING SIDEWALK CLOSURE) ONLINE AT DENVERGOV.ORG THROUGH E-PERMITS AT LEAST (5) DAYS PRIOR TO THE START OF CONSTRUCTION.
10. THE USE OF TYPICAL TRAFFIC CONTROL PLANS (TCP) IS LIMITED TO USE ON LOCAL OR RESIDENTIAL STREETS. SITE SPECIFIC METHODS OF HANDLING TRAFFIC (MHT) ARE REQUIRED FOR LANE OR SIDEWALK CLOSURES ON COLLECTOR OR ARTERIAL STREETS.
11. PRIOR TO THE START OF ANY RIGHT OF WAY WORK, THE CONTRACTOR SHALL SCHEDULE A PRECONSTRUCTION CONFERENCE AND INVITE PW ROW CONSTRUCTION ENGINEERING. CALL 303-446-3469 TO SCHEDULE A MEETING.
12. ALL IMPACTED LANDSCAPING TO BE RESTORED BY THE CONTRACTOR.

12. RTD REQUIRES A THREE (3) DAY NOTIFICATION FOR ALL BUS STOP CLOSURES. ALL REQUESTS NEED TO BE SENT TO RTD SIGN DEPARTMENT BUS.STOP@RTD-DENVER.COM 303-299-6563 OR 303-299-6561. FOR CONTACTS USE MICHELLE.SIMES@RTD-DENVER.COM 303-299-6563, GINA.CALLAHAN@RTD-DENVER.COM 303-299-6929 FOR SPECIFIC QUESTIONS AND THEY WILL ROUTE TO THE APPROPRIATE PERSON AT RTD. ANY EMERGENCY CLOSURES SHOULD BE SENT IMMEDIATELY.
13. ALL CITY & COUNTY OF DENVER (CCD) STORM AND/OR SANITARY SEWERS, INCLUDING MANHOLE ADJUSTMENTS, ARE TO BE INSPECTED BY CCD MAINLINE INSPECTIONS. THE CONTRACTOR SHALL CALL MAINLINE INSPECTIONS AT 303-446-3722, A MINIMUM OF TWO (2) BUSINESS DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING AND PRIOR TO STARTING ANY WORK. SEWER LOCATES CAN BE REQUESTED BY CALLING 303-446-3744. ALL CCD STORM AND/OR SANITARY SEWERS MUST BE CONSTRUCTED IN ACCORDANCE WITH CURRENT CCD-WASTEWATER MANAGEMENT DIVISION (WMD) STANDARD DETAILS AND SPECIFICATIONS.
14. THE CONTRACTOR SHALL KEEP THE WORK AREA DRY OF STANDING WATER AND SHALL KEEP THE EXCAVATION AREAS FREE FROM STORM RUN-OFF.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCEPTANCE AND CONTROL OF ALL SURFACE AND SUBSURFACE DRAINAGE AND GROUNDWATER ENTERING THE PROJECT AREA.
16. THE CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THOSE AREAS WITHIN THE LIMITS OF CONSTRUCTION.

SURVEYING

1. PRIOR TO BEGINNING WORK ON THE PROJECT, THE CONTRACTOR'S SURVEYOR SHALL PERFORM A SURVEY TO VERIFY ALL SURVEY CONTROL POINTS, CITY OF DENVER RANGE POINTS, SECTION CORNERS, AND BENCHMARKS AS LISTED ON THE SURVEY CONTROL DATA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL LAND SURVEY MONUMENTS REMOVED OR DISTURBED BY PROJECT ACTIVITY OR NEGLIGENCE ON THE PART OF THE CONTRACTOR. THE CONTRACTOR IS REQUIRED TO FOLLOW COLORADO STATE LAW REGARDING SURVEY MONUMENTS. THE CONTRACTOR SHALL RETAIN A COLORADO LICENSED PROFESSIONAL LAND SURVEYOR TO RESET ANY AFFECTED SURVEY MONUMENTS. THIS WILL NOT BE PAID SEPARATELY BUT SHALL BE INCLUDED IN THE WORK UNLESS SPECIFIED OTHERWISE IN SECTION 629. FOR FURTHER INFORMATION CONTACT PUBLIC WORKS - SURVEY DEPARTMENT (720-865-3121).
2. AFTER COMPLETION OF THE PAVING OPERATIONS, THE CONTRACTOR SHALL UPGRADE TEMPORARY RANGE POINTS WITH PERMANENT RANGE POINT MONUMENTS AT ALL LOCATIONS AS INDICATED ON THE LAND SURVEY CONTROL DIAGRAM. MONUMENTS SHALL MEET CURRENT CITY AND COUNTY OF DENVER STANDARDS. SEE SECTION 629 OF THE SPECIAL PROVISIONS FOR MORE INFORMATION.
3. A SURVEY SHALL BE DEPOSITED WITH THE CITY AND COUNTY OF DENVER PER STATE STATUTE. CITY MONUMENT TIE OUT SHEETS SHALL BE PREPARED FOR ALL RANGE POINTS WITHIN THE PROJECT AND DEPOSITED WITH THE CITY SURVEYOR.
4. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS, OR DEFACTS ANY PUBLIC LAND SURVEY MONUMENT AND/OR BOUNDARY MONUMENT OR ACCESSORY, COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE C.R.S. SECTION 18-4-508.
5. THE USE OF CONTROL MONUMENTS FOR CONSTRUCTION STAKING OTHER THAN THOSE SHOWN ON THE PLANS OR APPROVED BY THE PUBLIC WORKS DEPARTMENT IS PROHIBITED, AND USE OF SUCH MONUMENTS IS AT THE CONTRACTOR'S SOLE RISK.
6. PROPOSED FINISHED GROUND ELEVATIONS FOR ITEMS TO BE ADJUSTED, RESET OR MODIFIED SHALL BE FIELD VERIFIED BY THE CONTRACTOR.



9/23/2019 11:46:08 AM C:\pwworkdir\den003\ch2mhill_sb074278\00418232\001-YAL-GN_DET.dwg



Know what's below.
Call before you dig.

Print Date: 9/23/2019	
File Name: G01-YAL-GN_DET.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	



Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed	YALE STATION GENERAL NOTES (1 OF 5)		Project Number
No Revisions:			P0-00054216
Revised:	Designer: SAB	Structure Numbers	
Void:	Detailer: SAB		
	Sheet Subset: GENERAL	Subset Sheets: G02 of 6	Sheet Number 3

ENVIRONMENTAL

1. **ASBESTOS**
REGULATED ASBESTOS CONTAMINATED SOILS (RACS) MAY BE ENCOUNTERED IN BUILDING DEBRIS THROUGHOUT THE CITY DURING EXCAVATION. ALL RACS MUST BE MANAGED, DOCUMENTED, AND DISPOSED IN ACCORDANCE WITH STATE REGULATIONS PERTAINING TO SOLID WASTE SITES AND FACILITIES, SECTION 5 – ASBESTOS WASTE MANAGEMENT. STATE REGULATIONS REQUIRE ANY DISTURBED DEBRIS BE CHARACTERIZED TO DETERMINE APPLICABILITY OF THE REGULATION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING COMPETENT TRAINED PERSONNEL CAPABLE OF IDENTIFYING RACS IN DEBRIS AND HAVING ACCESS TO AN ONSITE CERTIFIED ASBESTOS BUILDING INSPECTOR (CABI) IN CASE OF RACS DISCOVERY.
2. **DUST CONTROL**
CONTRACTOR SHALL TAKE REASONABLE MEASURES TO PREVENT PARTICULATE MATTER FROM BECOMING AIRBORNE AND TO PREVENT THE VISIBLE DISCHARGE OF FUGITIVE PARTICULATE EMISSIONS BEYOND THE PROPERTY LINE FROM WHICH THE EMISSIONS ORIGINATE. THE MEASURES TAKEN MUST BE EFFECTIVE AT ALL TIMES ON THE SITE, INCLUDING PERIODS OF INACTIVITY SUCH AS EVENINGS, WEEKENDS, AND HOLIDAYS AS WELL AS ANY OTHER PERIOD OF INACTIVITY.
3. **UNEXPECTED DISCOVERY**
DURING ANY SOIL DISTURBING ACTIVITIES, IF UNKNOWN/UNIDENTIFIED UNDERGROUND STORAGE TANKS, DRUMS, ODOROUS SOIL, STAINED SOIL, ASBESTOS–CEMENT PIPE (TRANSITE), BUILDING DEBRIS, OR WASTE MATERIALS ARE ENCOUNTERED, CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA OF THE DISCOVERY UNTIL DENVER DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (DDPHE) MAKES A DETERMINATION OF HOW TO PROCEED. CONTRACTOR SHALL IMMEDIATELY NOTIFY DDPHE OF THE DISCOVERY AT (720) 460-8376.
4. **SOIL REUSE**
EXCESS SOIL FROM A CCD PROJECT MAY BE REUSED AT ANOTHER CCD PROPERTY OR A THIRD- PARTY SITE ONLY IF THE CRITERIA ESTABLISHED IN THE DDPHE OCTOBER 5, 2017, MEMORANDUM TITLED "GUIDANCE FOR REUSE OF SOIL ON CITY PROJECTS" ARE MET AND THE SOIL IS FREE OF ODORS, STAINING, AND DEBRIS. VIEW THE RE-USE GUIDELINES.
5. **IMPORTED SOIL**
FILL MATERIAL OR SOIL TO BE IMPORTED AND PLACED ON CCD-OWNED PROPERTY OR PLACED ON REAL PROPERTY TO BE TRANSFERRED TO THE CCD MUST BE FREE OF KNOWN CONTAMINATION (OBSERVED AND DOCUMENTED, OR PREVIOUSLY DOCUMENTED) AND BE ACCEPTABLE FOR UNRESTRICTED RESIDENTIAL USE. CONTACT DAVE ERICKSON (720 865 5433) FOR CLARIFICATION IF NEEDED.
6. **DISPOSAL**
THE CONTRACTOR SHALL DIRECT NON-RECYCLABLE, NON-HAZARDOUS WASTES FROM CCD-OWNED OR CONTROLLED PROPERTY OR FACILITIES TO THE DENVER ARAPAHOE DISPOSAL SITE (DADS) LANDFILL FOR DISPOSAL, FOLLOWING THE REQUIREMENTS AND PROCEDURAL GUIDANCE PER CCD EXECUTIVE ORDER 115. LABORATORY ANALYTICAL RESULTS WILL BE REQUIRED PRIOR TO DADS ACCEPTANCE FOR SOIL AND POSSIBLY OTHER MATERIALS. EARLY TESTING IS RECOMMENDED; DDPHE CAN ASSIST. CONTACT DDPHE AT 720 865 5448 WITH QUESTIONS.
7. **NOISE CONTROL.**
ALL NOISE CAUSED BY CONSTRUCTION OF, OR RESULTING FROM, COMPLETED PROJECTS, MUST COMPLY WITH DENVER'S NOISE ORDINANCE, D.R.M.C. CHAPTER 36 "NOISE CONTROL," EXEMPTED HOURS FOR CONSTRUCTION IN THE CITY AND COUNTY OF DENVER ARE FROM 7 TO 9 P.M. MONDAY THROUGH FRIDAY AND 8 A.M. TO 5 P.M. ON SATURDAYS AND SUNDAYS. IF THERE IS A NEED TO WORK OUTSIDE OF THE EXEMPTED HOURS: 1) THE CONTRACTOR MUST REQUEST A VARIANCE, AND 2) THE VARIANCE PROCESS NEEDS TO BE STARTED A MINIMUM OF THREE MONTHS PRIOR TO THE DESIRED START DATE. ANY QUESTIONS SHOULD BE DIRECTED TO PAUL RIEDESEL, DDPHE COMMUNITY NOISE PROGRAM, 720-865-5410.

EROSION CONTROL

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL ENSURE THAT ALL POTENTIAL POLLUTANTS GENERATED DURING DEMOLITION OR CONSTRUCTION WORK ASSOCIATED WITH THIS PROJECT, BE PREVENTED FROM DISCHARGE TO STREAMS, WETLANDS OR ANY WATER BODY IN THE VICINITY OF THIS PROJECT SITE IN ACCORDANCE WITH THE FOLLOWING.
2. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL PREVENT SEDIMENT, DEBRIS AND ALL OTHER POLLUTANTS FROM ENTERING THE WATERWAY DURING ALL DEMOLITION, EXCAVATION, TRENCHING, BORING, GRADING, OR OTHER CONSTRUCTION OPERATIONS THAT ARE PART OF THIS PROJECT. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM, RECEIVING WATERS, WATERWAYS, WETLANDS, AND/OR OTHER PUBLIC OR PRIVATE PROPERTIES, RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
3. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO OR ACCUMULATED IN THE FLOW LINES OF STORM DRAINAGE APPURTENANCES AND PUBLIC RIGHTS OF WAYS OF THE CITY AND COUNTY OF DENVER, AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT. ALL REMOVALS SHALL BE CONDUCTED IN A TIMELY MANNER.
4. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL ENSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THIS SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHTS OF WAY. (SEC. 49-552; REVISED MUNICIPAL CODE)
5. THE USE OF REBAR TO ANCHOR BEST MANAGEMENT PRACTICES, OTHER THAN PORTABLE TOILETS, IS PROHIBITED.
6. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL IMPLEMENT THE FOLLOWING BEST MANAGEMENT PRACTICES (BMPs) ON SITE DURING CONSTRUCTION.
 - INLET PROTECTION: THIS BMP IS REQUIRED ON ALL EXISTING OR PROPOSED STORM SEWER INLETS IN THE VICINITY OF THE CONSTRUCTION SITE THAT MAY RECEIVE SITE RUNOFF. THE BMP MUST BE APPROPRIATE TO THE TYPE OF STORM INLET AND APPROPRIATE FOR THE GROUND SURFACE AT THE INLET.
 - INTERIM SITE STABILIZATION: THIS BMP IS REQUIRED TO PROVIDE A MEASURE FOR PREVENTING THE DISCHARGE OF SEDIMENT FROM CONSTRUCTION SITES WHERE OVERLOT GRADING OR OTHER SITE DISTURBANCE HAS OCCURRED. THIS BMP IS PARTICULARLY NECESSARY ON SITES WHERE CONSTRUCTION ACTIVITIES/DISTURBANCE WILL BE LIMITED TO SMALL AREAS OF THE PROJECT SITE. INTERIM SITE STABILIZATION WILL BE PAID FOR UNDER LANDSCAPE MAINTENANCE. ACCEPTABLE BMPs INCLUDE:
 - A) PRESERVING EXISTING VEGETATION
 - B) TEMPORARY/PERMANENT RE-VEGETATION OPERATIONS
 - WASTE MANAGEMENT/CONTAINMENT: THIS BMP REQUIRES THAT ALL CONSTRUCTION WASTES, FUELS, LUBRICANTS, CHEMICAL WASTES, TRASH, SANITARY WASTES, CONTAMINATED SOILS OR DEBRIS SHALL BE CONTAINED ON SITE, PROTECTED FROM CONTACT WITH PRECIPITATION OR SURFACE RUNOFF, PERIODICALLY REMOVED FROM THE CONSTRUCTION SITE, AND PROPERLY DISPOSED OF.
 - SPILL PREVENTION/CONTAINMENT: THIS BMP DEFINES THE MEASURES PROPOSED FOR PREVENTING, CONTROLLING, OR CONTAINING SPILLS OF FUEL, LUBRICANTS, OR OTHER POLLUTANTS; AND PROTECTING POTENTIAL POLLUTANTS FROM CONTACT WITH PRECIPITATION OR RUNOFF.
 - CONCRETE WASHOUT CONTAINMENT: WATER USED IN THE CLEANING OF CEMENT TRUCK DELIVERY CHUTES SHALL BE DISCHARGED INTO A PREDEFINED, BERMED CONTAINMENT AREA ON THE JOB SITE. THE REQUIRED CONTAINMENT AREA IS TO BE BERMED SO THAT WASH WATER IS TOTALLY CONTAINED. WASH WATER DISCHARGED INTO THE CONTAINMENT AREA SHALL BE ALLOWED TO INFILTRATE OR EVAPORATE. DRIED CEMENT WASTE IS REMOVED FROM THE CONTAINMENT AREA AND PROPERLY DISPOSED OF. THE DIRECT OR INDIRECT DISCHARGE OF WATER CONTAINING WASTE CEMENT TO THE STORM SEWER SYSTEM IS PROHIBITED (SEC.56-106A,C; REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).
 - SWEEPING: THIS BMP REQUIRES THAT IMPERVIOUS SURFACES WHICH ARE ADJACENT TO OR CONTAINED WITHIN CONSTRUCTION SITES BE SWEEPED ON A DAILY BASIS OR AS NEEDED DURING THE DAY WHEN SEDIMENT AND OTHER MATERIALS ARE TRACKED OR DISCHARGED ON TO THEM. EITHER SWEEPING BY HAND OR USE OF STREET SWEEPERS IS ACCEPTABLE. STREET SWEEPERS USING WATER WHILE SWEEPING IN PREFERRED IN ORDER TO MINIMIZE DUST. FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED. SWEEPING WILL BE PAID FOR UNDER MOBILIZATION.



DEPARTMENT OF PUBLIC WORKS
201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed	No Revisions:		YALE STATION GENERAL NOTES (2 OF 5)		Project Number
	Revised:		Designer: SAB	Structure Numbers	PO-00054216
	Void:		Detailer: SAB	Sheet Subset: GENERAL	
			Subset Sheets: G03 of 6	Sheet Number	4

Sheet Revisions		
Date:	Comments	Init.



Print Date: 9/23/2019	
File Name: G01-YAL-GN_DET.L.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	
JACOBS	

9/23/2019 4:13:28 PM C:\pw\workdir\den003\ch2mhill_s074278\d0418232\G01-YAL-GN_DET.L.dwg

- SAW CUTTING OPERATIONS: THE CONTRACTOR SHALL PROTECT ALL STORM SEWER FACILITIES ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING, OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS OR AS NEEDED THROUGHOUT THE WORK DAY. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE STORM SEWER SYSTEM IS PROHIBITED. (SEC.56-102A, C; REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER)
7. EROSION AND SEDIMENT CONTROL 'BEST MANAGEMENT PRACTICES' SHALL BE MAINTAINED AND KEPT IN EFFECTIVE OPERATING CONDITION FOR THE DURATION OF THIS PROJECT. ALL NECESSARY MAINTENANCE AND REPAIR SHALL BE COMPLETED IMMEDIATELY UPON DISCOVERY OF ANY DEFICIENCY OR DEFECT.

UTILITIES:

1. UTILITY INFORMATION AS SHOWN ON THE PLAN SHEETS IS PLOTTED FROM THE BEST AVAILABLE INFORMATION. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE PROJECT SPECIFICATIONS CONCERNING UTILITIES. THE CONTRACTOR SHALL CALL 811 FOR UTILITY LOCATIONS AT LEAST TWO (2) WORKING DAYS PRIOR TO ANY DIGGING, NOT INCLUDING THE DAY OF ACTUAL CONTACT.
2. THE CONTRACTOR SHALL POTHOLE UTILITIES PRIOR TO ANY EXCAVATION WORK. ALL CONFLICTING UTILITIES SHALL BE EXPOSED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND INSPECTED BY THE ENGINEER TO VERIFY CONFORMANCE WITH THE PLANS. THIS PARTICULARLY APPLIES TO CULVERT CROSSINGS AND OTHER UNDERGROUND WORK TO BE COMPLETED ON THIS PROJECT BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF UTILITY RELOCATION BY UTILITY COMPANIES, IF REQUIRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING UTILITIES DURING CONSTRUCTION AND SHALL HOLD THE CITY AND COUNTY OF DENVER HARMLESS FOR DAMAGES ARISING FROM THE CONTRACTOR'S FAILURE TO ADEQUATELY PROTECT EXISTING UTILITIES.
3. IT IS ESTIMATED THAT 30 POTHOLES FOR A TOTAL OF 75 HOURS WILL BE REQUIRED FOR UTILITY POTHOLING PER INTERSECTION.
4. THE CONTRACTOR SHALL PERFORM ALL REQUIRED UTILITY ADJUSTMENTS ON STORM, SANITARY, AND WATER IMPROVEMENTS. ALL OTHER UTILITY ADJUSTMENTS WILL BE CONSTRUCTED BY THE UTILITY OWNERS.

PAVEMENT, CURB AND GUTTER, SIDEWALK AND CURB RAMPS

1. ANY LAYER OF HMA PAVEMENT THAT IS TO HAVE A SUCCEEDING LAYER PLACED THEREON SHALL BE COMPLETED FULL WIDTH BEFORE SUCCEEDING LAYER IS PLACED.
2. REMOVAL OF ASPHALT MAT, CONCRETE PAVEMENT, CURB AND GUTTER, OR SIDEWALK REQUIRED ON THIS PROJECT SHALL BE SAW CUT TO A VERTICAL EDGE. SAW CUTS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK. REMOVAL LIMITS FOR SIDEWALK AND CURB AND GUTTER SHALL BE TO THE NEAREST JOINT.
3. HMA (PATCHING) (ASPHALT) SHALL BE PLACED AT 11.5" DEPTH OR MATCH THE DEPTH OF THE SURROUNDING EXISTING PAVEMENT WHICHEVER IS GREATER. HOT MIX ASPHALT FOR PATCHING SHALL CONFORM TO THE REQUIREMENTS OF HMA (GRADING S OR SX)(75)(PG 64-22). REFER TO MGPEC.ORG, HEM 20 SPECIFICATIONS FOR ASPHALT MIX AND CONSTRUCTION AND COMPACTION USING N=75, PG 64-22 MIXES DESIGN CRITERIA. THE THICKNESS OF SUBSEQUENT PAVEMENT LIFTS MUST BE EQUAL TO OR GREATER THAN THE LIFT DIRECTLY ABOVE. ASPHALT PATCHING SHALL FOLLOW CCD STANDARD DRAWINGS 12.0 THROUGH 12.7, WHICH ARE AVAILABLE ON THE CCD WEBSITE.
4. ALL SOIL SUBGRADE FOR ASPHALT PATCH BACK, AND INSTALLATION OF CURB AND GUTTER, SIDEWALK, AND CURB RAMPS SHALL BE PROOF ROLLED BY THE CONTRACTOR TO FIND ANY UNSUITABLE AREAS OF SUPPORT.
5. RATES OF APPLICATION SHALL BE AS DETERMINED BY THE ENGINEER AT THE TIME OF APPLICATION.
6. CONCRETE FOR SIDEWALKS, CURB AND GUTTER, AND CONCRETE PAVEMENT SHALL CONSIST OF CLASS P CONCRETE. CLASS B OR CLASS D MAY BE SUBSTITUTED ON SIDEWALKS NOT TO BE DRIVEN ON BY VEHICLES.
7. ALL CONCRETE USED ON THIS PROJECT SHALL INCORPORATE CLASS 2 SULFATE RESISTANT CRITERIA OF SECTION 608 IN THE PROJECT SPECIFICATIONS.
8. ALL CONCRETE ON THIS PROJECT SHALL USE COMPRESSIVE STRENGTH ACCEPTANCE CRITERIA.

9. CURB AND GUTTER TO BE REPLACED SHALL BE POURED AGAINST EXISTING PAVEMENT. HMA PATCHING WILL NOT BE ALLOWED, EXCEPT AS SHOWN ON THE PLANS. IF CONCRETE FILLS VOIDS IN OR BELOW THE EXISTING ASPHALT, A BOND BREAKER (ZIPSTRIP) SHOULD BE INSERTED ALONG THE INTENDED OUTER EDGE OF GUTTER LIP AFTER CONCRETE CONSOLIDATION TO PREVENT LOAD TRANSFER CRACKS FROM AFFECTING THE NEW GUTTER SECTION.
10. ANY CURB AND GUTTER OR ASPHALT WHICH IS TO REMAIN AND IS DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
11. COMPACTION FOR THIS PROJECT SHALL BE PER SECTION 203 OF THE CDOT STANDARD SPECIFICATIONS AND ANY AND ALL APPLICABLE PROJECT AND STANDARD SPECIAL PROVISIONS.
12. ALL NEW CURB AND GUTTER AND SIDEWALK INSTALLATIONS SHALL FOLLOW CCD STANDARD DRAWINGS 5.2 THROUGH 5.4. ALL NEW CURB RAMP INSTALLATIONS SHALL FOLLOW CCD STANDARD DRAWINGS 7.0 THROUGH 7.8.
13. ANY PAVEMENT OR ROW CONCRETE (RAMPS, WALKS, CROSS PANS, MEDIAN COVER, CAISSON COVERINGS) SHOULD BE MAGNESIUM CHLORIDE DEICER RESISTANT, SO WILL REQUIRE CDOT CLASS 2 SULFATE MITIGATION PER SECTION 608. USE ASTM C-1315 CURE & SEAL ON FLATWORK DURING ANTICIPATED DE-ICER SEASON OF OCTOBER 1ST THROUGH APRIL 30TH AND ONLY AFTER ALL BLEED WATER HAS RISEN AND BEEN REMOVED.

TRAFFIC

1. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE TRAFFIC CONTROL THROUGHOUT THE PROJECT, INCLUDING PROPER TRAFFIC CONTROL DEVICES AND PERSONNEL. A TRAFFIC CONTROL PLAN (TCP) IS SUBJECT TO CITY APPROVAL PRIOR TO COMMENCING WORK ON ROADWAY RIGHT-OF-WAY. A COPY OF APPROVED TCPs MUST BE AVAILABLE ON SITE DURING WORK. TRAFFIC CONTROL IS TO BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). SITE SPECIFIC PLANS ARE REQUIRED ON COLLECTOR AND ARTERIAL STREETS, AND MUST SHOW ALL EXISTING FEATURES.
2. ALL PAVEMENT MARKINGS MUST BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
3. COORDINATE ALL TRAFFIC SIGNAL EQUIPMENT RELOCATIONS WITH PUBLIC WORKS TRANSPORTATION DESIGN.
4. UNIFORMED TRAFFIC CONTROL (UTC) REQUIRED TO BE USED TO CONTROL (OVER-RIDE) TRAFFIC AT SIGNALIZED INTERSECTIONS, OR WHEN DIGGING WITHIN 100 FT OF A LIGHTED, SIGNALIZED INTERSECTION. MUST USE OFF DUTY DENVER POLICE. CALL KEVIN SMOLKA, 720-327-7333, SEVERAL DAYS IN ADVANCE TO SCHEDULE.

TRAFFIC SIGNAL GENERAL

1. ITEM NUMBER REFERS TO THE APPROPRIATE SECTION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION - COLORADO DEPARTMENT OF TRANSPORTATION 2017.
2. THE CONTRACTOR SHALL BE AWARE OF THE FRANCHISE AGREEMENT IN PLACE BETWEEN THE CITY & COUNTY OF DENVER AND XCEL ENERGY. PER THE FRANCHISE AGREEMENT ALL EXISTING TRAFFIC SIGNAL POLES WITH STREET LIGHTS ATTACHED AND STREET LIGHT POLES ARE OWNED AND MAINTAINED BY XCEL ENERGY. ALL NEW TRAFFIC SIGNAL POLES WILL BE OWNED AND MAINTAINED BY THE CITY AND COUNTY OF DENVER, AND THEREFORE ALL SUBMITTALS FOR TRAFFIC SIGNAL POLES AND STREET LIGHTS SHALL BE MADE TO THE CITY & COUNTY OF DENVER TRANSPORTATION. NO TRAFFIC SIGNAL POLES OR STREET LIGHT POLES SHALL BE ORDERED UNTIL A SUBMITTAL HAS BEEN ACCEPTED FROM XCEL ENERGY AND CITY & COUNTY OF DENVER TRANSPORTATION.
3. NO TRAFFIC SIGNAL SHALL BE TURNED ON OR TURNED OFF ON A FRIDAY OR PRIOR TO A HOLIDAY WITHOUT PRIOR NOTIFICATION TO TRANSPORTATION & MOBILITY (720-865-4000).

TRAFFIC SIGNAL HARDWARE

1. ALL OVERHEAD SIGNAL HEADS SHALL BE CONSTRUCTED OF DIE CAST ALUMINUM AND PAINTED DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
2. POLY SIGNAL HEADS ARE REQUIRED FOR ALL POLE MOUNT SIGNALS AND PEDESTRIAN SIGNALS. ALL POLY HEADS SHALL BE DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
3. ALL HARDWARE INCLUDING SPACERS, ELBOWS, POLE PLATES AND PLUMBIZERS SHALL BE PAINTED DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
4. LIGHT EMITTING DIODE (LED) SIGNAL LENSES SHALL BE INSTALLED IN ALL SIGNAL INDICATORS (RED, YELLOW, GREEN, AND WALK, DON'T WALK, AND COUNTDOWN PEDESTRIAN SIGNAL SECTIONS).
5. EXACT LOCATION OF THE SIGNAL POLES AND PEDESTALS SHALL BE DETERMINED IN THE FIELD BY CITY & COUNTY OF DENVER TRANSPORTATION & MOBILITY.



Know what's below.
Call before you dig.

Print Date: 9/23/2019	
File Name: G01-YAL-GN_DET.L.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	



Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed	YALE STATION GENERAL NOTES (3 OF 5)		Project Number
No Revisions:			P0-00054216
Revised:	Designer: SAB	Structure Numbers	
Void:	Detailer: SAB	Sheet Subset: GENERAL	Subset Sheets: G04 of 6
			Sheet Number 5

9/23/2019 2:52:15 PM C:\pwworkdir\den003\ch2mhill_s074278\d0418232\G01-YAL-GN_DET.L.dwg

TRAFFIC SIGNAL CONSTRUCTION

1. CONDUIT RUNS SHOWN AS (3D) (3) TO BE TWO 3 INCH SCHEDULE 80 PVC FOR TRAFFIC AND ONE 2 INCH SCHEDULE 80 PVC FOR ELECTRIC UTILITY. SCHEDULE 80 PVC WILL CONSTITUTE THE MINIMUM REQUIRED CONDUIT THICKNESS.
2. TWO PULL BOXES TO BE INSTALLED AT LOCATIONS SHOWN AS (3H). DESIGNATE ON LID "TRAFFIC" FOR SIGNAL CABINETS AND "ELECTRIC" FOR ELECTRIC UTILITY CABLES BY PHYSICALLY EMBOSSING, NOT PAINTING. PULL BOX LIDS FOR COMMUNICATION CONDUITS (3H)(SPECIAL) SHALL BE DESIGNATED "TRAFFIC COMM" BY PHYSICALLY EMBOSSING, NOT PAINTING. SEE STD. DWG. NO. 16.1.7 FOR PULL BOX DIMENSIONS.
3. A SINGLE 3 INCH CONDUIT SHALL BE REQUIRED AND INSTALLED FROM THE TRAFFIC COMM PULL BOX TO THE TRAFFIC SIGNAL CONTROLLER CABINET. CONDUIT SHALL BE SCHEDULE 80 PVC CONDUIT.
4. INTERCONNECT CONDUIT PULL BOXES SHALL BE PLACED AT 500 FOOT MAXIMUM SPACING, OR OTHERWISE DIRECTED BY CITY & COUNTY OF DENVER ENGINEER.
5. ALL HOLES IN TRAFFIC SIGNAL POLES TO BE DRILLED OR SAWED. INSTALLING HOLES BY BURNING WITH A TORCH IS NOT APPROVED.
6. THE BOTTOM OF ALL SPANWIRE MOUNTED SIGNAL HEADS SHALL BE ON THE SAME HORIZONTAL PLANE AND HAVE A MINIMUM CLEARANCE OF 16'-6" AND A MAXIMUM CLEARANCE OF 19'-0" ABOVE CROWN OF PAVEMENT SURFACE, UNLESS OTHERWISE SPECIFIED BY TRAFFIC ENGINEERING SERVICES. ALL SPAN WIRE SHALL INCLUDE A BOTTOM WIRE OR WIND TETHER.
7. EXISTING SIGNAL FACES SHALL REMAIN VISIBLE AND ILLUMINATED UNTIL NEW SIGNALS ARE TURNED ON. BLOCKING OF EXISTING FACE BY NEW FACE WILL REQUIRE NEW FACE TO BE TEMPORARILY WIRED FOR ILLUMINATION.
8. ANCHOR BOLTS SHALL NOT BE TRIMMED UNTIL SIGNAL POLE BASE ELEVATION IS APPROVED BY CITY & COUNTY OF DENVER ENGINEER.
9. ALL SIGNAL HEADS SHALL BE CENTERED ON THE TRAVEL LANES UNLESS OTHERWISE APPROVED BY CITY AND COUNTY OF DENVER ENGINEER.
10. ALL TRAFFIC SIGNAL WIRE CONNECTORS SHALL BE OF THE BUCHANNAN COMPRESSION TYPE WITH COPPER NONFERROUS CONNECTORS AND IDEAL WRAP-CAPS OR APPROVED EQUAL.
11. WIRE SPLICING IN THE PULL BOXES IS NOT ALLOWED EXCEPT FOR THE LOOP WIRES. ALL LOOP WIRES SHALL BE SPLICED IN THE WATER VALVE TRAFFIC PULL BOX.
12. THREE (3) 3-INCH SPARE CONDUITS SHALL BE PROVIDED TO EACH PULL BOX AND TO THE END OF EACH MAST ARM.
13. ALL SOLDERLESS CONNECTORS SHALL BE USED.
14. BARE WIRE IN OPTICOM CABLE SHALL BE SHRINK TUBED ON BOTH ENDS FOR TOTAL INSULATION.

TRAFFIC SIGNAL SIGNING

1. OVERHEAD STREET NAME SIGNS TO BE FURNISHED AND INSTALLED ON EACH MAST ARM AS NOTED ON STD. DWG. NO. 16.1.10 DETAIL 9. SIGN TO BE ON 18 INCH TELSPAR EXTENSION WHICH CONNECTS TO THE MAST ARM BY USE OF ADAPTER SCREWED INTO HOUSING.
2. CONTRACTOR SHALL NOT REMOVE ANY REGULATORY TRAFFIC SIGNS UNLESS SPECIFIED ON PLANS. CITY & COUNTY OF DENVER, TRANSPORTATION DIVISION TO BE NOTIFIED 48 HOURS PRIOR TO ANY SIGNING CHANGES AT 720-865-4000.
3. ALL PERTINENT SIGNS AND PAVEMENT MARKINGS MUST BE IN PLACE AT THE TIME A TRAFFIC SIGNAL CHANGE IS MADE, SUCH AS A NEW SIGNAL TURN ON, AND OR CHANGES MADE TO EXISTING SIGNAL OPERATION.

OFFICE OF THE CITY FORESTER STANDARD NOTES:

1. PER CITY CODE, ALL TREE REMOVALS IN DENVER LIMITS MUST BE PERFORMED BY PROPERTY OWNER OR A TREE CONTRACTOR LICENSED BY OFFICE OF THE CITY FORESTER, INCLUDING TREES IN ROW'S AND ON PRIVATE PROPERTY. FOR A CURRENT LIST OF LICENSED TREE CONTRACTORS, VISIT WWW.DENVERGOV.ORG/FORESTRY.
 - A. FOR FORESTRY-APPROVED TREE REMOVALS IN PUBLIC RIGHT(S) OF WAY: A TREE REMOVAL PERMIT ISSUED BY THE OFFICE OF THE CITY FORESTER IS REQUIRED PRIOR TO REMOVAL. TREE REMOVAL PERMITS ARE NOT INCLUDED WITH BUILDING PERMITS AND MUST BE OBTAINED SEPARATELY FROM THE OFFICE OF THE CITY FORESTER. TO OBTAIN TREE REMOVAL PERMIT, CONTACT OFFICE OF THE CITY FORESTER (FORESTRY@DENVERGOV.ORG) WITH NAME OF LICENSED CONTRACTOR OR PROPERTY OWNER PERFORMING REMOVAL. INCLUDE D-LOG NUMBER (2018-PROJMSTR-XXXXXX) WHEN REQUESTING REMOVAL PERMIT.
2. A FORESTRY-ISSUED TREE PLANTING PERMIT IS REQUIRED FOR ALL TREES TO BE PLANTED IN PUBLIC RIGHTS OF WAY. CONTACT OFFICE OF THE CITY FORESTER (FORESTRY@DENVERGOV.ORG) WITH NAME OF CONTRACTOR OR PROPERTY OWNER PERFORMING PLANTING. INCLUDE D-LOG NUMBER (2018-PROJMSTR-XXXXXX) WHEN REQUESTING PERMIT. TREE PLANTING PERMITS ARE NOT INCLUDED WITH BUILDING PERMITS AND MUST BE OBTAINED SEPARATELY FROM THE OFFICE OF THE CITY FORESTER PRIOR TO INSTALLATION.
3. PLEASE CONTACT FORESTRY FOR ANY CHANGES TO THE PLANS REGARDING TREE PROTECTIONS. BE SURE TO COMMUNICATE WITH FORESTRY OPERATIONS FOR PROTECTION OF PARK TREES.



Know what's below.
Call before you dig.

Print Date: 9/18/2019	
File Name: G01-YAL-GN_DET.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	



Sheet Revisions		
Date:	Comments	Init.



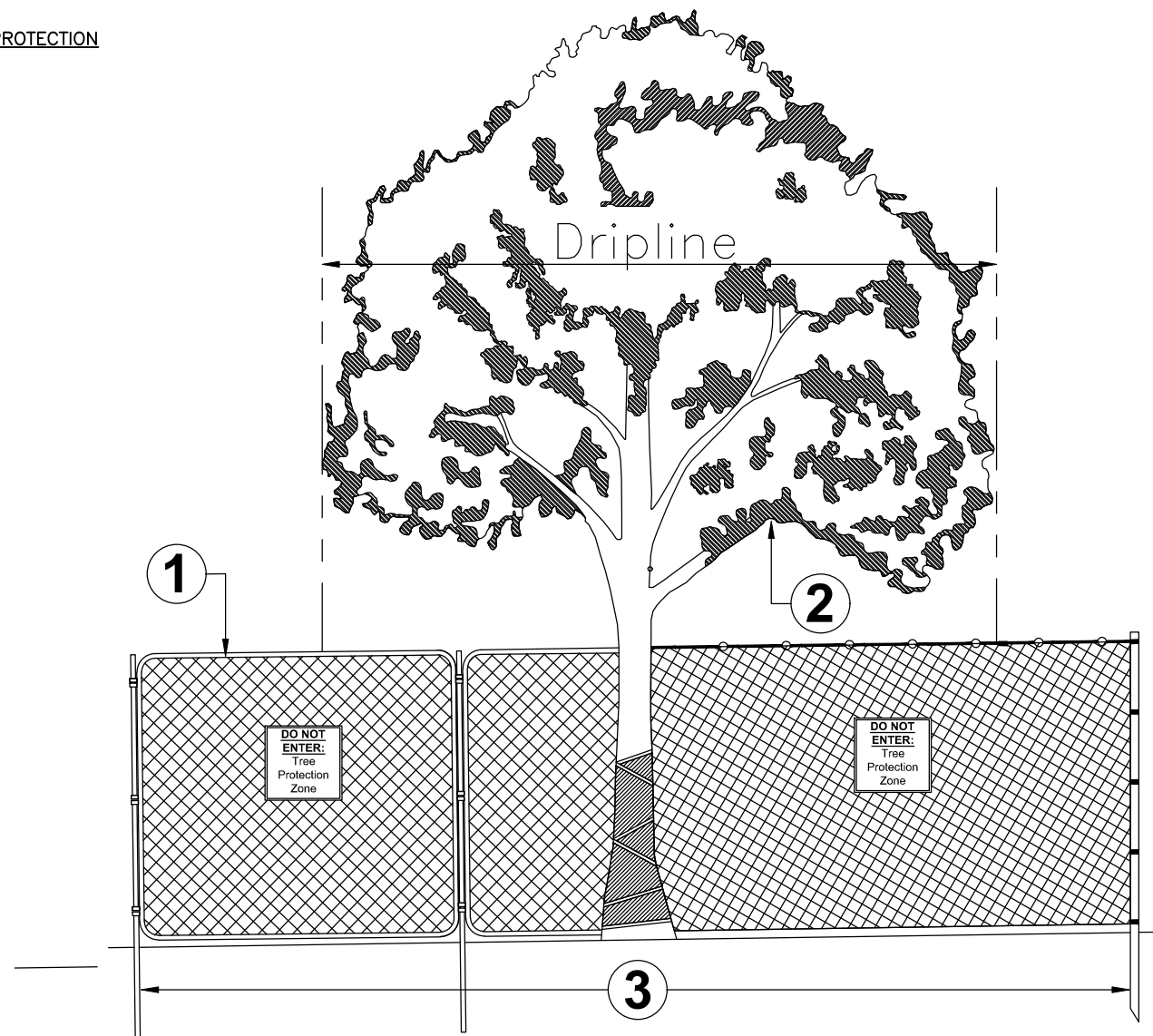
DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed	YALE STATION GENERAL NOTES (4 OF 5)		Project Number
	No Revisions:		P0-00054216
	Revised:	Designer: SAB	Structure Numbers
Void:	Detailer: SAB	Sheet Subset: GENERAL	Subset Sheets: G05 of 6
			Sheet Number 6

9/18/2019 11:35:54 AM C:\pwworkdir\den003\ch2mhill_s0074278\00418232\G01-YAL-GN_DET.dwg

TREE PROTECTION



Area 1: Tree Protection Zone

The Tree Protection Zone (TPZ) shall be equal to dripline or eighteen inches (18") radially from the tree for every one inch of trunk diameter at breast height (DBH = 4.5' above soil line), whichever is greater.

A. Min 6' in height steel chain link fence is required unless otherwise approved by the Office of the City Forester (OCF). Steel chain link fence panels or rolls are acceptable.

1. When chain link rolls are installed, it shall be fastened to heavy duty steel posts at minimum five (5) attachment points with 12-gauge wire, including points at top and bottom.
2. Steel posts shall be driven 24" to 36" below grade and spaced at max. five to ten foot (5' - 10') o.c. intervals. Fencing must be kept taut at all times.
3. "Tree Protection Zone" signs shall be placed one (1) per each tree protection zone minimum or more per direction of City Forester; maintain in the location and condition in which approved.
4. TPZ, including signage, shall be maintained in the location and condition in which approved.
5. Fencing to be paid for under 214-00145 Plant Protect Fence.

Area 2: Lower Canopy Protection

Contact OCF if potential for damage exists and/or if pruning is needed for any clearance issues prior to performing work.

Area 3: Critical Root Zone and/or Structural Root Zone Protection

Any work in these areas must have written approval of OCF prior to commencement of activity. Contact OCF for instruction.

The Critical Root Zone (CRZ) shall be equal to twelve inches (12") radially from the tree for every one inch of trunk diameter at breast height.

The Structural Root Zone (SRZ) shall be equal to six inches (6") radially from the tree for every one inch of trunk diameter at breast height.

Notes

1. OCF Tree Retention and Protection Specifications shall be followed throughout duration of work.
2. After TPZ is approved;
 - A. TPZ shall not be resized, modified, removed, or altered in any manner without prior written approval. TPZ shall be maintained in place as approved until removal is authorized by OCF.
 - B. Entrance/access to the TPZ is not permitted without prior written approval from the OCF.
 - C. No materials, debris, equipment, or site amenities shall be stored within the TPZ without prior written approval from the OCF.
3. While TPZ fencing is in place, trees shall be deep-root watered at an interval of once per week when temperatures are at or above 40-degrees F. Trees shall be watered at the rate of twenty (20) gallons per inch caliper. OCF may ask for documented proof of watering.
4. Violation of TPZ or damage to protected trees is subject to penalty per City Ordinance.

EARTHWORK

1. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE ORDERED AND WILL NOT BE PAID FOR SEPARATELY.
2. DEPTH OF MOISTURE - DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLANS: FULL DEPTH OF ALL EMBANKMENTS BASES OF CUTS AND FILLS = 6 INCHES
3. RECONDITIONING FOR SIDEWALKS, CURB RAMPS, AND CURB AND GUTTER SHALL BE 6 INCHES OR AS OTHERWISE SHOWN.
4. EXCAVATION REQUIRED FOR THE COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.
5. EARTHWORK WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT WILL BE INCIDENTAL TO THE PAVEMENT, CURB AND GUTTER, CURB RAMPS, AND SIDEWALK.
6. THE INSPECTOR MAY ALLOW HAND OPERATED COMPACTION EQUIPMENT, SUCH AS JUMPING JACK OR HEAVY ROLLER, FOR PROOF ROLLING, OR FOLLOWING CDOT 203.08 CRITERIA IN TIGHT SPACES, DEPENDING ON THE SIZE OF THE CONSTRUCTION AREA.

ABBREVIATIONS

- BOC BACK TOP OF CURB
- BOW BACK OF WALK
- EOP EDGE OF PAVEMENT
- FL FLOWLINE
- PL PANLINE
- SW SIDEWALK
- TOR TOP OF RAMP



Know what's below.
Call before you dig.

Print Date: 9/20/2019	
File Name: G01-YAL-GN_DET.L.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	



Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed	YALE STATION GENERAL NOTES (5 OF 5)		Project Number
	No Revisions:		P0-00054216
	Revised:	Designer: SAB	Structure Numbers
Void:	Detailer: SAB	Sheet Subset: GENERAL	Subset Sheets: G06 of 6
			Sheet Number 7

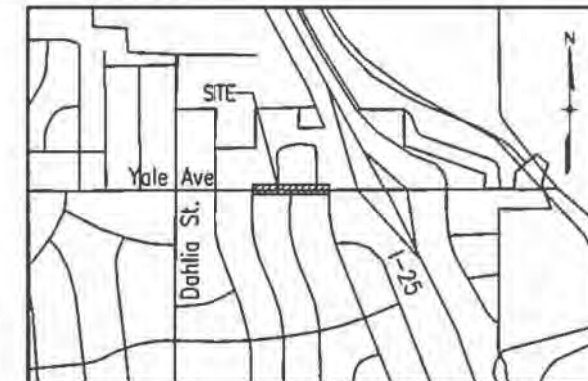
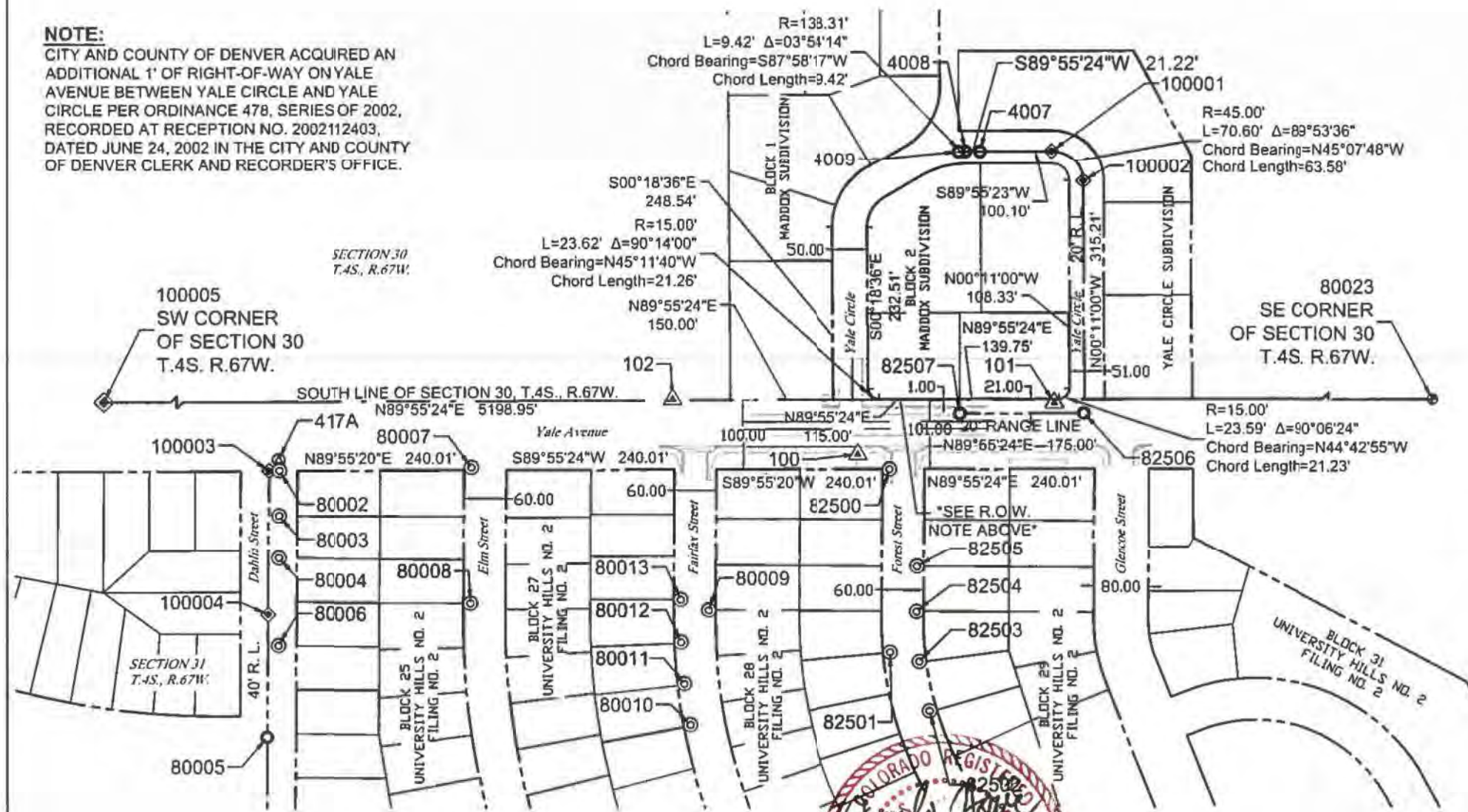
9/20/2019 9:39:46 AM C:\pwworkdir\dem003\ch2mill_s074278\0418232\G01-YAL-GN_DET.L.dwg

SURVEY CONTROL DIAGRAM - YALE AVENUE

PART OF SECTIONS 30 & 31, TOWNSHIP 4 SOUTH, RANGE 67 WEST OF THE 6TH P.M.
CITY AND COUNTY OF DENVER, STATE OF COLORADO

NOTE:

CITY AND COUNTY OF DENVER ACQUIRED AN ADDITIONAL 1' OF RIGHT-OF-WAY ON YALE AVENUE BETWEEN YALE CIRCLE AND YALE CIRCLE PER ORDINANCE 478, SERIES OF 2002, RECORDED AT RECEPTION NO. 2002112403, DATED JUNE 24, 2002 IN THE CITY AND COUNTY OF DENVER CLERK AND RECORDER'S OFFICE.



- SURVEY FEATURE LEGEND**
- FOUND RANGE POINT
 - ⊙ FOUND SECTION CORNER
 - △ CONTROL POINT
 - ⊕ FOUND BENCHMARK
 - ⊙ FOUND MONUMENT
 - ◆ CALCULATED POINT
 - RANGE LINE
 - - - ALIQUOT LINE
 - RIGHT OF WAY LINE
 - PROPERTY LINE



GENERAL NOTES:

1. DATE OF FIELD SURVEY: DECEMBER 2018 - MARCH 2019.
2. DISTANCES ARE MARKED IN FEET AND DECIMAL PLACES THEREOF. NO DIMENSION SHALL BE ASSUMED BY SCALE MEASUREMENT HEREON.
3. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS, OR DEFACTS ANY PUBLIC LAND SURVEY MONUMENT OR LAND MONUMENT OR ACCESSORY, COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, C.R.S.
4. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECTS IN THIS SURVEY WITHIN THREE (3) YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN (10) YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
5. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY JACOBS ENGINEERING GROUP INC. OR THE SURVEYOR OF RECORD.



SURVEYOR'S STATEMENT

I, DOUGLAS R. HOWE, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF COLORADO, DO HEREBY STATE TO THE CITY AND COUNTY OF DENVER, THAT THIS SURVEY CONTROL DIAGRAM WAS PREPARED UNDER MY RESPONSIBLE CHARGE, AND BASED UPON MY KNOWLEDGE, INFORMATION, AND BELIEF, IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE, EXCEPT AS NOTED HEREON. THIS STATEMENT IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

DOUGLAS R. HOWE, P.L.S. NO. 38154

Date: _____
For and on behalf of Jacobs Engineering Group Inc.
717 17th St., Suite 2750
Denver, CO 80202
720-286-6223

DEPOSITING CERTIFICATE

DEPOSITED THIS _____ DAY OF _____, 20____, AT _____, M.,
IN BOOK _____ OF THE COUNTY SURVEYOR'S LAND SURVEY / RIGHT-OF-WAY SURVEYS
AT PAGE(S) _____, RECEPTION NO. _____

COUNTY SURVEYOR / DEPUTY COUNTY SURVEYOR

Print Date: 08/14/2019
File Name: V-YALE-CTRL-DIAG
Horiz. Scale: As Noted Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman

Sheet Revisions		
Date:	Comments	Ini.

DEPARTMENT OF PUBLIC WORKS
201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed	YALE STATION PROJECT SURVEY CONTROL DIAGRAM	
No Revisions:	Designer: RFG	Structure Numbers
Revised:	Detailer: RFG	
Void:	Sheet Subset: SURVEY	Subset Sheets: SURV01 of 2

Project Number	PO-00054216
Sheet Number	8

SURVEY CONTROL DIAGRAM - YALE AVENUE

PART OF SECTIONS 30 & 31, TOWNSHIP 4 SOUTH, RANGE 67 WEST OF THE 6TH P.M.
CITY AND COUNTY OF DENVER, STATE OF COLORADO

CONTROL POINTS				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	367966.952	591401.126	5433.12	SET 2" ALUMINUM CAP
101	368040.722	591579.017	5440.51	SET 2" ALUMINUM CAP
102	368046.515	591133.656	5429.23	SET 2" ALUMINUM CAP
417A	367959.278	590569.082	5423.24	FOUND 2" BRASS CAP - CITY AND COUNTY OF DENVER BENCHMARK

CALCULATED POINTS			
POINT #	NORTHING	EASTING	DESCRIPTION
100001	368405.469	591675.664	CALCULATED RANGE POINT
100002	368360.613	591720.725	CALCULATED RANGE POINT
100003	367943.843	590555.680	CALCULATED RANGE POINT
100004	367734.918	590554.258	CALCULATED RANGE POINT
100005	368040.414	587997.758	CALCULATED ALIQUOT CORNER BASED OFF FOUND REFERENCE TIES FROM MONUMENT RECORD DATED JULY 31, 2014

FOUND BOUNDARY MONUMENTATION			
POINT #	NORTHING	EASTING	DESCRIPTION
4007	368405.322	591574.879	#8 REBAR DOWN 0.5' IN RANGE BOX
4008	368405.293	591554.347	#8 REBAR DOWN 0.8' IN RANGE BOX
4009	368404.975	591544.963	#8 REBAR DOWN 0.8' IN RANGE BOX
80002	367943.980	590570.267	CUT CROSS
80003	367878.822	590569.692	CUT CROSS
80004	367815.877	590569.322	CUT CROSS
80005	367559.092	590552.730	AXLE DOWN 1.1' IN RANGE BOX
80006	367689.909	590568.487	CHISELED CROSS
80007	367947.902	590845.839	NAIL AND TAG MARKED "PLS 24930"
80008	367751.019	590844.249	CHISELED CROSS
80009	367740.725	591184.168	CHISELED CROSS
80010	367576.047	591158.019	CHISELED CROSS
80011	367635.000	591149.207	CHISELED CROSS
80012	367694.519	591144.753	CHISELED CROSS
80013	367756.084	591144.364	CHISELED CROSS
80023	368047.383	593196.704	3.25" ALUMINUM CAP ILLEGIBLE
82500	367945.148	591445.711	CHISELED CROSS
82501	367680.085	591446.36	CHISELED CROSS
82502	367595.627	591502.365	CHISELED CROSS
82503	367666.617	591437.934	CHISELED CROSS
82504	367738.695	591434.364	CHISELED CROSS
82505	367803.64	591434.874	CHISELED CROSS
82506	368025.441	591721.012	3.25" ALUMINUM CAP STAMPED "PLS 33204 AZTEC RANGE POINT"
82507	368025.108	591546.021	3.25" ALUMINUM CAP STAMPED "PLS 33204 AZTEC RANGE POINT"

HORIZONTAL POSITIONS:

COORDINATES SHOWN ARE BASED UPON CITY AND COUNTY OF DENVER DATUM, NAD83(2011), AS PROVIDED BY THE CITY AND COUNTY OF DENVER SURVEYOR'S OFFICE.

PROJECT MAPPING PROJECTION:

PROJECTION: USER-DEFINED TRANSVERSE MERCATOR
 ZONE: CCD_LOCAL
 CENTRAL POINT FALSE NORTHING: 400,000.000
 CENTRAL POINT FALSE EASTING: 600,000.000
 LATITUDE OF ORIGIN: N39°45'19.000"
 CENTRAL MERIDIAN: W104°53'53.000"
 ZONE WIDTH: 6°00'00"
 SCALE FACTOR AT ORIGIN: 1.00025403000
 UNITS: US SURVEY FOOT



VERTICAL POSITIONS:

VERTICAL ELEVATIONS WERE BASED ON THE FOLLOWING BENCHMARKS PROVIDED BY THE CITY AND COUNTY OF DENVER SURVEYOR'S OFFICE:

CITY AND COUNTY OF DENVER BENCHMARK: 417A
 CCD BRASS CAP IN CONCRETE, LOCATED AT THE SOUTHEAST CORNER OF YALE AVENUE AND DAHLIA STREET.
 ELEVATION: 5423.24 (NAVD88)

Print Date: 08/14/2019		Sheet Revisions	As Constructed	YALE STATION PROJECT SURVEY CONTROL DIAGRAM	Project Number
File Name: V-YALE-CTRL-DIAG		Date: Comments Int.	No Revisions:		PO-00054216
Horiz. Scale: As Noted Vert. Scale: As Noted	○		Revised:	Designer: RFG	
City Project Manager: Morgan Whitcomb & Emily Cushman	○		Void:	Detailer: RFG	
JACOBS	○			Sheet Subset: SURVEY	Structure Numbers
	○			Subset Sheets: SURV02 of 2	Sheet Number 9



DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

Contract Item No.	Contract Item	Unit	Roadway		Traffic			Utilities	Project Totals	
			Removals	Curb Ramps, Sidewalks, Curb and Gutter and Miscellaneous	Traffic Signs	Pavement Markings	Traffic Signals	Utilities	Plan	As Const.
			Sheet 11	Sheet 12	Sheet 13	Sheet 14	Sheet 20	Sheet 22		
201-00000	Clearing and Grubbing	L S	1						1	
202-00195	Removal of Median Cover	SY	2						2	
202-00200	Removal of Sidewalk	SY	17						17	
202-00203	Removal of Curb and Gutter	LF	39						39	
202-00205	Removal of Concrete Curb Ramp	SY	5						5	
202-00220	Removal of Asphalt Mat	SY	56						56	
202-00240	Removal of Asphalt Mat (Planing)	SY	276						276	
202-00250	Removal of Pavement Marking	SF	1041						1041	
202-00810	Removal of Ground Sign	EACH			1				1	
203-01597	Potholing	HOUR		75					75	
208-00035	Aggregate Bag	LF		30					30	
208-00045	Concrete Washout Structure	EACH		1					1	
208-00051	Storm Drain Inlet Protection (Type 1)	LF		3					3	
208-00205	Erosion Control Supervisor	HOUR		40					40	
210-00861	Reset Wiring - Fiber Optic	L S						1	1	
214-00000	Landscape Maintenance	L S		1					1	
214-00145	Plant Protect Fence	LF		60					60	
403-00721	Hot Mix Asphalt (Patching) (Asphalt)	SY		56					56	
403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)	TON		40					40	
412-00190	Concrete Pavement (Patching)	SY		6					6	
412-00600	Concrete Pavement (6 Inch)	SY		3					3	
503-00024	Drilled Caisson (24 Inch)	LF					7		7	
503-00036	Drilled Caisson (36 Inch)	LF					39		39	
607-11580	Construction Limit Fencing	LF		25					25	
608-00010	Concrete Curb Ramp	SY		32					32	
608-00015	Detectable Warnings	SF		44					44	
609-21010	Curb and Gutter Type 2 (Section I-B)(6" Curb and Gutter - 1' Spill Pan)	LF		188					188	
609-21020	Curb and Gutter Type 2 (Section II-B)(6" Curb and Gutter - 2' Catch/Spill Pan)	LF		31					31	
610-00030	Median Cover Material (Concrete - 6 Inch)	SF		480					480	
613-XXXX	Electric Meter Pedestal Cabinet and Base	Each					1		1	
613-00205	2 Inch Electrical Conduit (Bored)	LF					195		195	
613-00305	3 Inch Electrical Conduit (Bored)	LF					365		365	
613-01200	2 Inch Electrical Conduit (Plastic)	LF					115		115	
613-01300	3 Inch Electrical Conduit (Plastic)	LF					185		185	
613-07000	Pull Box (Special)	EACH					3		3	
613-07002	Type Two Pull Box	EACH					4		4	
613-07003	Type Three Pull Box	EACH					5		5	
613-10000	Wiring	L S					1		1	
613-13000	Luminaire (LED)	EACH					4		4	
614-00011	Sign Panel (Class I)	SF			24		14		38	
614-00012	Sign Panel (Class II)	SF					28		28	
614-00216	Steel Sign Post (2x2 Inch Tubing)	LF			23				23	
614-70150	Pedestrian Signal Face (16) (Countdown)	EACH					4		4	
614-70335	Traffic Signal Face (12-12-12)	EACH					8		8	
614-70448	Traffic Signal Face (12-12-12)	EACH					2		2	
614-72855	Traffic Signal Controller and Cabinet	EACH					1		1	
614-72860	Pedestrian Push Button	EACH					3		3	
614-72863	Pedestrian Push Button Post Assembly	EACH					2		2	
614-72865	Fire Preemption Unit and Timer	EACH					3		3	
614-72895	Intersection Detection System (FLIR Camera)	EACH					2		2	
614-81000	Traffic Signal-Light Pole Steel	EACH					1		1	
614-81120	Traffic Signal-Light Pole Steel (1-20 Foot Mast Arm)	EACH					2		2	
614-81140	Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm)	EACH					1		1	
614-86105	Telemetry (Field)	EACH					1		1	
614-86800	Uninterrupted Power Supply	EACH					1		1	
614-87333	Closed Circuit Television Camera (Traffic Monitoring)	EACH					1		1	
614-87690	Ethernet Managed Switch	EACH					1		1	
625-00000	Construction Surveying	L S							1	
627-00005	Epoxy Pavement Marking	GAL				6			6	
627-30405	Preformed Thermoplastic Pavement Marking (Walk-Symbol)	SF				47			47	
627-30410	Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF				339			339	
629-01001	Survey Monument (Type 1)	EACH		3					3	
630-XXXX	Construction Traffic Control	LS		1					1	
630-00003	Uniformed Traffic Control	HOUR		16					16	
700-70082	F/A Furnish & Install Electrical Service	F A							1	
700-70589	F/A Environmental Health & Safety Management	F A							1	



Tue Oct 22 12:05:19 2019 C:\pwworkdir\dem003\ch2\mill_sab74278\00418232\001-YAL-SQ_EST.dwg



Know what's below.
Call before you dig.

Print Date: 10/22/19
 File Name: Q01-YAL-SQ_EST.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman

Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

YALE STATION SUMMARY OF APPROXIMATE QUANTITIES			
Designer:	SAB	Structure Numbers	
Detailer:	SAB	Subset Sheets:	TABS
Sheet Subset:	TABS	Subset Sheets:	Q01 of 5

Project Number
P0-00054216
Sheet Number 10

Tabulation of Removals									
Region	Clearing and Grubbing	Removal of Median Cover	Removal of Sidewalk	Removal of Curb and Gutter	Removal of Concrete Curb Ramp	Removal of Asphalt Mat	Removal of Asphalt Mat (Planing)	Removal of Pavement Marking	Notes
	LS	SY	SY	LF	SY	SY	SY	SF	
NE Corner		2	17	39	5	10			NE corner at Yale Avenue and Yale Circle.
Yale Circle								181	
Median						46			Full depth patch area.
Yale Avenue							276	860	Planing limits are shown on median details.
Project Totals	1	2	17	39	5	56	276	1041	



Know what's below.
Call before you dig.

Print Date: 10/17/2019
 File Name: Q01-YAL-SQ_EST.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions		
Date:	Comments	Init.



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed	YALE STATION			Project Number
	TABULATION OF REMOVALS			
No Revisions:				P0-00054216
Revised:	Designer: SAB	Structure Numbers		Sheet Number 11
Void:	Detailer: SAB	Subset Sheets: Q02 of 5		

10/17/2019 8:55:03 PM C:\pwworking\den003\c2mhill_ab074278\00418232\Q01-YAL-SQ_EST.dwg

For Information Only For Information Only For Information Only

203-01597 208-00035 208-00045 208-00051 208-00205 214-00145 403-00721 403-34741 412-00190

Pavement, Curb Ramps, Sidewalks, Curb and Gutter and Miscellaneous Items												
Region	Potholing	Topsoil	Aggregate Bag	Concrete Washout Structure	Storm Drain Inlet Protection (Type 1)	Erosion Control Supervisor	Mulching (Decorative)	Plant Protect Fence	Plant (Ball and Burlap)	Hot Mix Asphalt (Patching) (Asphalt)	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)	Concrete Pavement (Patching)
	HOUR	CF	LF	EA	LF	HR	CF	LF	EA	SY	TON	SY
	75					40						
NE Corner		10*	20	1	2		20*	60	7*	10		2
Yale Circle												
Median										46		4
Yale Avenue			10		1						40	
Project Totals	75	10*	30	1	3	40	20*	60	7*	56	40	6

For Information Only

412-00600 607-11580 603-00010 608-00015 609-21010 609-21020 610-00030 629-01001 630-XXXXX 630-00003

Pavement, Curb Ramps, Sidewalks, Curb and Gutter and Miscellaneous Items											
Region	Concrete Pavement (6 Inch)**	Construction Limit Fencing	Concrete Curb Ramp**	Detectable Warnings	Curb and Gutter Type 2 (Section I-B) (6" Curb and Gutter - 1' Spill)	Curb and Gutter Type 2 (Section II-B) (6" Curb and Gutter - 2')	Median Cover Material (Concrete - 6 Inch)	2 Inch Plastic Pipe (Irrigation/Sleeve)	Survey Monument (Type 1)	Construction Traffic Control	Uniformed Traffic Control
	SY	LF	SY	SF	LF	LF	SF	LF	EA	LS	Hour
									3		
NE Corner	3	25	28	20		31		20*			
Yale Circle											
Median			4	24	188		480				
Yale Avenue										1	16
Project Totals	3	25	32	44	188	31	480	20*	3	1	16

*Landscaping will be paid for as a lump sum. Pay items shown for reference only. Plant material and types are to be approved by City and County of Denver Maintaining Personnel.

**Concrete Pavement (6 inch) includes the teardrop between curb ramps. Concrete Curb Ramp includes the ramps and sidewalk replacement.



Know what's below.
Call before you dig.

Print Date: 10/17/2019
 File Name: Q01-YAL-SQ_EST.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed	YALE STATION TABULATION OF CURB RAMPS, SIDEWALKS, CURB AND GUTTER AND MISCELLANEOUS ITEMS		Project Number
No Revisions:	Designer: SAB	Structure Numbers	PO-00054216
Revised:	Detailer: SAB		
Void:	Sheet Subset: TABS	Subset Sheets: Q03 of 5	Sheet Number 12

10/17/2019 8:38:49 PM C:\p\workdir\den003\c2mhill_ab074278\00418232\Q01-YAL-SQ_EST.dwg

614-00011 302-00810 614-00216

Tabulation of Signs												
Sign No.	Direction	Sign Code	Sign Panel Size			Background Color	Legend	Sign Panel	Removal of Ground Sign	Steel Sign Post (2x2 Inch Tubing)	Remarks	
			W"	x	H"			Class I				
								SF				EACH
1	a	East	R4-7	24	x	30	White	Keep Right	5.0		11.5	
	b	East	OM3-L	12	x	36	Yellow	Object Marker	3.0			
2	a	West	R4-7	24	x	30	White	Keep Right	5.0		11.5	
	b	West	OM3-L	12	x	36	Yellow	Object Marker	3.0			
3	South	R3-5R		30	x	36	White	Right Turn Only	7.5		Mount below existing R1-1 panel	
4	North	R1-1	REMOVE				Red	Stop				
Project Totals									24	1	23	



Know what's below.
Call before you dig.

Print Date: 9/18/2019
 File Name: Q01-YAL-SQ_EST.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions			
Date:	Comments	Init.	



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
 No Revisions:
 Revised:
 Void:

YALE STATION
 TABULATION OF SIGNS
 Designer: SAB
 Detailer: SAB
 Sheet Subset: TABS
 Structure Numbers
 Subset Sheets: Q04 of 5

Project Number
 P0-00054216
 Sheet Number 13

9/18/2019 3:09:32 PM C:\p_w\workdir\dem003\ch2mill_s074278_d0418232\Q01-YAL-SQ_EST.dwg

627-00005B 627-00005G 627-00005H 627-30405 627-30410

TABULATION OF PAVEMENT MARKINGS							
Region	Marking Type / Word-Symbol / Xwalk-Stop Line	Epoxy Pavement Marking			Preformed Thermoplastic Pavement Marking (Word- Symbol)	Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	Description
		Dbl Yellow Solid 4 in	White Broken 4 in	White Solid 8 in			
Yale Circle		150				121	
Yale Avenue		449	662	284	47	218	
	TOTAL (LF)	599	662	284			
	TOTAL (SF)	399.3	55.2	189.3	47.0	339.0	
	TOTAL (GAL)	3.80	0.53	1.80			



Know what's below.
Call before you dig.

Print Date: 9/23/2019
 File Name: Q01-YAL-SQ_EST.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions		
Date:	Comments	Init.



DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed	YALE STATION			Project Number
No Revisions:	TABULATION OF PAVEMENT MARKINGS			P0-00054216
Revised:	Designer: SAB	Structure Numbers		
Void:	Detailer: SAB	Subset Sheets: Q05 of 5		Sheet Number 14







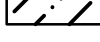
9/23/2019 3:04:54 PM C:\p_w\workdir\den003\ch2mill_s074278_d0418232\Q01-YAL-SQ_EST.dwg

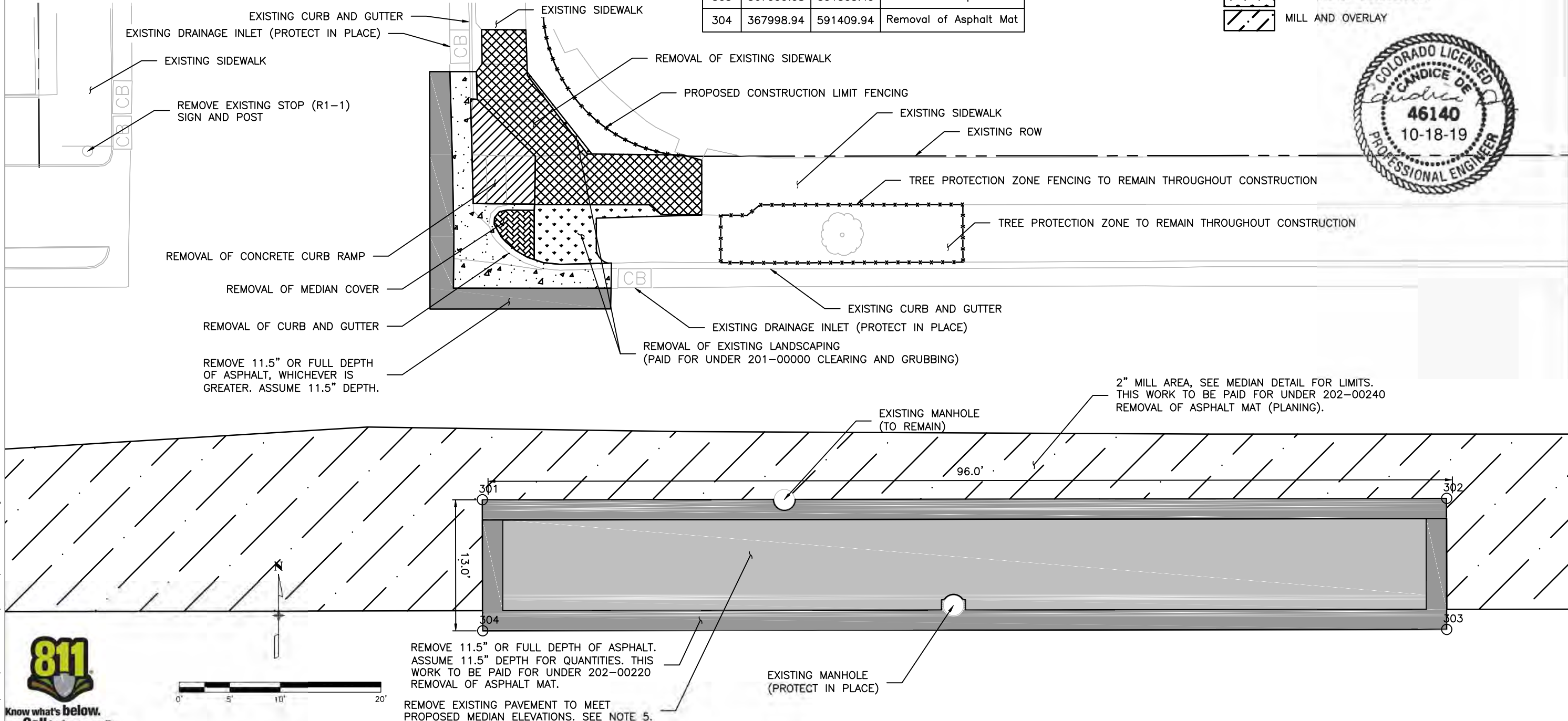
NOTES

1. WHERE APPLICABLE, SAWCUTS INTO ASPHALT SHALL BE MADE 2' FROM EXISTING GUTTER.
2. SAWCUTS INTO CONCRETE SHALL BE MADE AT EXISTING JOINT LINES.
3. REMOVAL OF EXISTING LANDSCAPING WILL BE PAID FOR BY PAY ITEM 201-00000 CLEARING AND GRUBBING. ADDITIONAL DISTURBANCE OF EXISTING LANDSCAPE NOT SHOWN ON PLANS WILL REQUIRE REPLACEMENT. THIS IS PAID FOR UNDER 214-00000 LANDSCAPE MAINTENANCE.
4. SEE TRAFFIC SIGNAL SHEET FOR EXISTING CCD ITS PULLBOX REMOVAL INFORMATION.
5. PAYMENT FOR ANY EXCAVATION AND BACKFILL NEEDED FOR CONSTRUCTION OF THE MEDIAN WILL BE INCLUDED IN THE MEDIAN CONSTRUCTION COSTS.

REMOVALS POINT TABLE			
Point	Northing	Easting	POINT DESCRIPTION
301	368011.94	591409.92	Removal of Asphalt Mat
302	368012.08	591505.49	Removal of Asphalt Mat
303	367999.08	591505.49	Removal of Asphalt Mat
304	367998.94	591409.94	Removal of Asphalt Mat

LEGEND

-  REMOVAL OF CONCRETE CURB RAMP
-  REMOVAL OF SIDEWALK
-  REMOVAL OF CURB AND GUTTER
-  REMOVAL OF ASPHALT MAT
-  REMOVAL OF MEDIAN COVER
-  REMOVAL OF LANDSCAPING
-  MILL AND OVERLAY



2" MILL AREA, SEE MEDIAN DETAIL FOR LIMITS. THIS WORK TO BE PAID FOR UNDER 202-00240 REMOVAL OF ASPHALT MAT (PLANING).

REMOVE 11.5" OR FULL DEPTH OF ASPHALT. ASSUME 11.5" DEPTH FOR QUANTITIES. THIS WORK TO BE PAID FOR UNDER 202-00220 REMOVAL OF ASPHALT MAT.

REMOVE EXISTING PAVEMENT TO MEET PROPOSED MEDIAN ELEVATIONS. SEE NOTE 5.

10/18/2019 10:19:00 AM C:\p_w\workdir\den003\ch2mill_s074278_c0418232\R01-YAL-RD_PLAN.dwg



Know what's below. Call before you dig.



Print Date: 10/18/2019
 File Name: R01-YAL-RD_PLAN.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman
JACOBS

Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

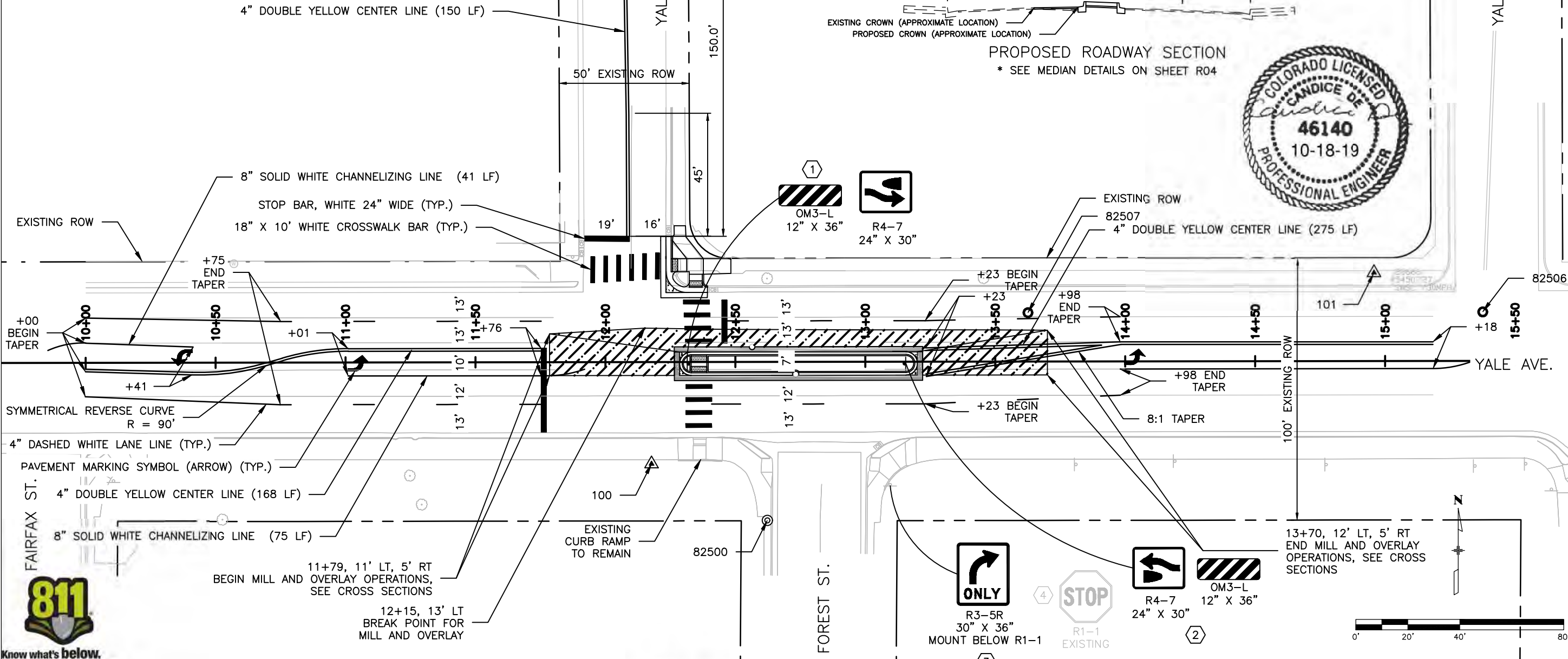
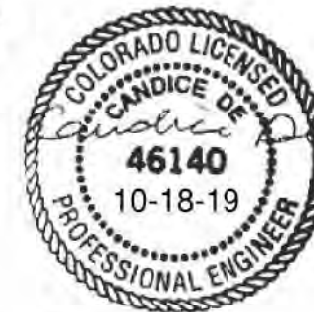
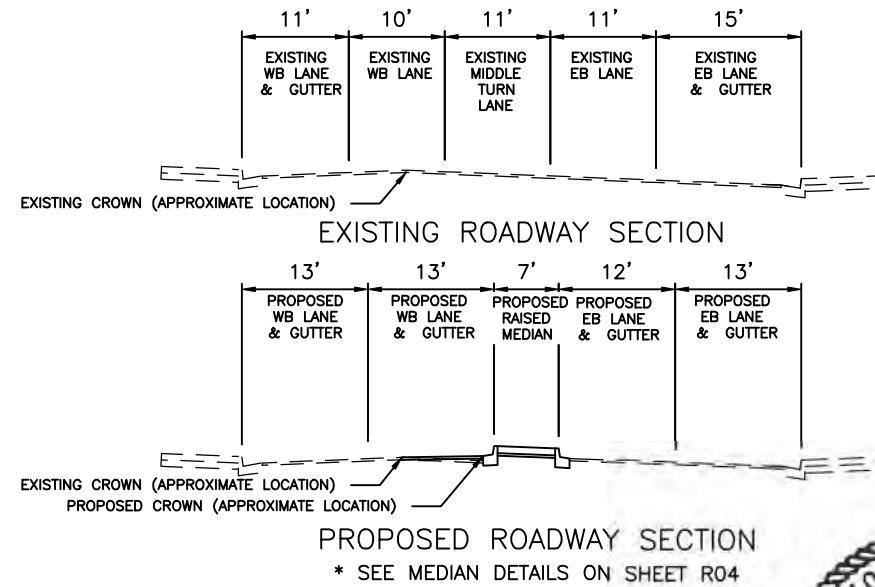
As Constructed
No Revisions:
Revised:
Void:

YALE STATION			
DEMOLITION PLAN			
Designer:	SAB	Structure Numbers	
Detailer:	SAB		
Sheet Subset:	ROADWAY	Subset Sheets:	R01 of 7

Project Number
P0-00054216
Sheet Number
15

NOTES

1. PAVEMENT MARKINGS SHALL BE EPOXY PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
2. ALL CROSSWALKS, STOP BARS, AND SYMBOLS SHALL BE PREFORMED THERMOPLASTIC.
3. CROSSWALKS WILL BE DESIGNED TO CITY AND COUNTY OF DENVER LATEST EDITION STD. DWG. 16.2.1.
4. PAVEMENT MARKING SYMBOLS (ARROW) WILL BE LOCATED ACCORDING TO CITY AND COUNTY OF DENVER LATEST EDITION STD. DWG. 16.2.2.2
5. CONTACT TRANSPORTATION & MOBILITY BEFORE SIGN FABRICATION AT 720-865-4000.
6. FOR ADDITIONAL DETAIL ON CURB RAMP AND MEDIAN DESIGN SEE SHEETS 17 AND 18.
7. ALL LANE WIDTHS ARE MEASURED FROM FLOWLINE.
8. SEE TRAFFIC SIGNAL PLAN FOR SIGN NOTES.



- 4" DASHED WHITE LANE LINE (TYP.)
- PAVEMENT MARKING SYMBOL (ARROW) (TYP.)
- 4" DOUBLE YELLOW CENTER LINE (168 LF)
- 8" SOLID WHITE CHANNELIZING LINE (75 LF)



Know what's below. Call before you dig.

Print Date: 10/17/2019	
File Name: R01-YAL-RD_PLAN.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	



Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

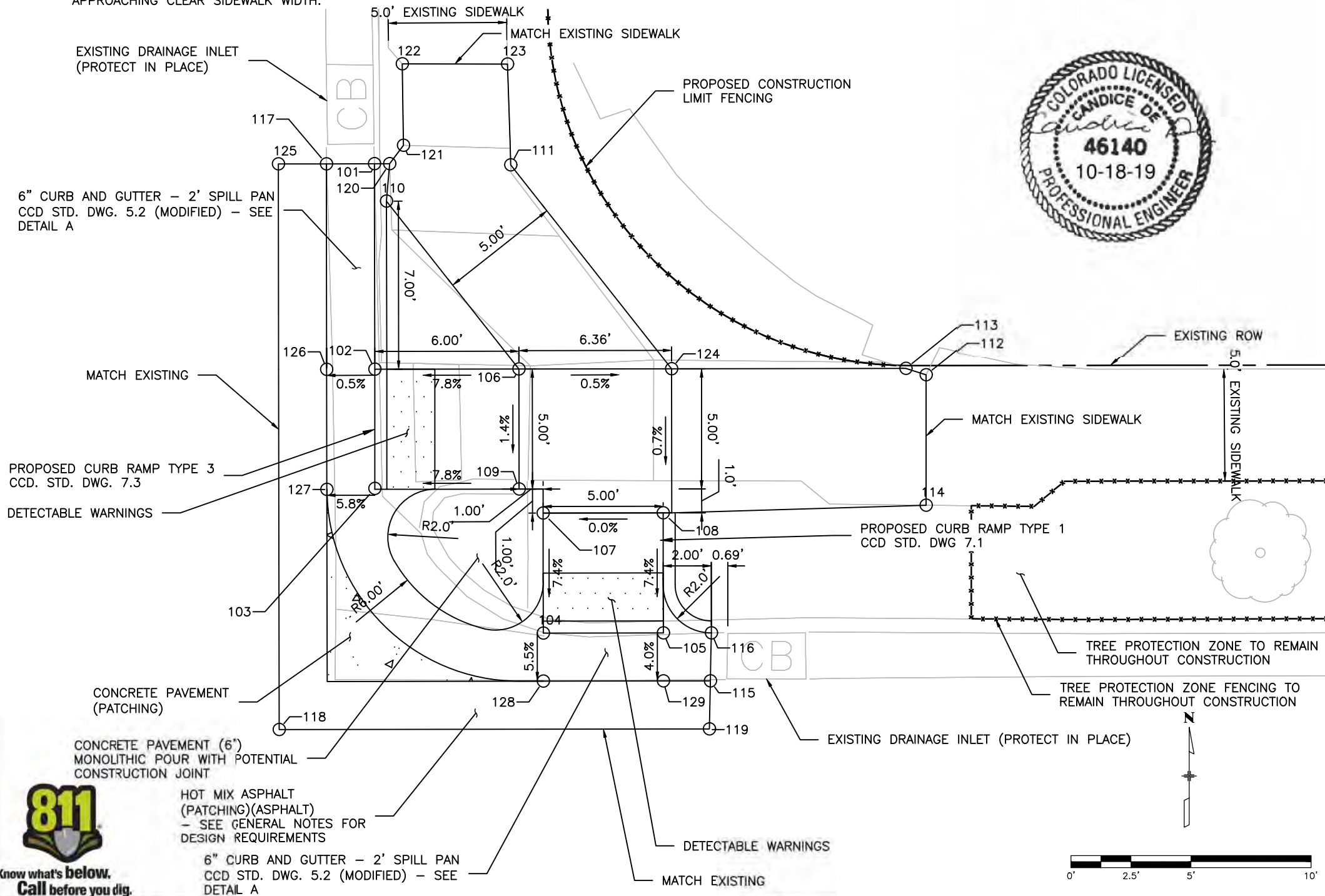
YALE STATION ROADWAY PLAN			
Designer:	SAB	Structure Numbers:	
Detailer:	SAB	Sheet Subset:	ROADWAY
		Subset Sheets:	R02 of 7

Project Number
P0-00054216
Sheet Number
16

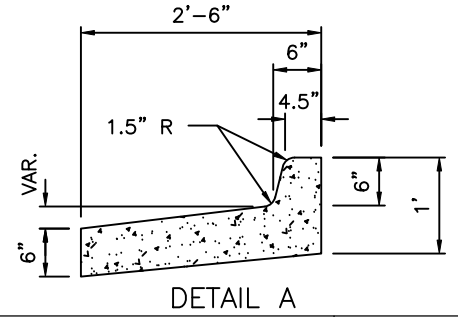
10/17/2019 7:27:23 PM C:\p\work\den003\ch2\mhl_ab074278_v0418232\R01-YAL-RD_PLAN.dwg

NOTES

- SAWCUTS INTO CONCRETE SHALL BE MADE AT EXISTING JOINT LINES.
- GUTTER WILL TRANSITION FROM EXISTING CATCH GUTTER AT NORTHERN INLET TO SPILL GUTTER BEFORE POINT 102. REFERENCE CCD WASTEWATER MANAGEMENT STANDARD DETAIL S-616.2 FOR 2' TRANSITION TO INLET. FROM POINT 102 TO 105 THE GUTTER WILL REMAIN A SPILL PAN. FROM POINT 105 THE PAN WILL TRANSITION TO TIE-IN TO THE EXISTING GUTTER SLOPES THE PAN WILL REMAIN 2' IN WIDTH.
- SAWCUTS ADJACENT TO EXISTING DRAINAGE INLETS SHALL NOT IMPACT INLET OR INLET SUPPORT STRUCTURES. CONTRACTOR TO FIELD VERIFY REQUIRED SAWCUT OFFSET.
- CURB RAMP THROATS AND APPROACHING CLEAR SIDEWALKS SHALL BE 5' WIDE. ADDITIONAL WIDENING TO FACILITATE A LARGER LANDING AREA WILL NOT BE CONSIDERED PART OF THE APPROACHING CLEAR SIDEWALK WIDTH.



CURB RAMPS POINT TABLE				
Point	Northing	Easting	ELEVATION	POINT DESCRIPTION
101	368054.42	591408.69	5433.9 ±	Match Existing
102	368045.86	591408.70	5433.77	Front of Ramp
103	368040.90	591408.71	5433.70	Front of Ramp
104	368034.87	591415.72	5433.80	Front of Ramp
105	368034.88	591420.72	5433.80	Front of Ramp
106	368045.87	591414.70	5434.24	Back of Ramp
107	368039.87	591415.71	5434.17	Back of Ramp
108	368039.88	591420.71	5434.17	Back of Ramp
109	368040.87	591414.71	5434.17	Back of Ramp
110	368052.86	591409.19	5434.47	Back of Curb
111	368054.38	591414.36	5434.49	Back of Sidewalk
112	368045.63	591431.66	5434.4 ±	Match Existing
113	368045.90	591430.82	5434.4 ±	Match Existing
114	368040.20	591431.66	5434.4 ±	Match Existing
115	368032.88	591422.67	5433.7 ±	Match Existing
116	368034.88	591422.72	5433.7 ±	Match Existing
117	368054.41	591406.69	5433.9 ±	Match Existing
118	368030.86	591404.72	5433.4 ±	Match Existing
119	368030.88	591422.63	5433.8 ±	Match Existing
120	368054.42	591409.32	5434.4 ±	Match Existing
121	368055.18	591409.90	5434.4 ±	Match Existing
122	368058.58	591409.84	5434.6 ±	Match Existing
123	368058.57	591414.23	5434.7 ±	Match Existing
124	368045.88	591421.06	5434.2 ±	Back of Sidewalk
125	368054.41	591404.69	5433.9 ±	Match Existing
126	368045.86	591406.70	5433.76	Lip of Gutter
127	368040.86	591406.71	5433.58	Lip of Gutter
128	368032.87	591415.72	5433.69	Lip of Gutter
129	368032.88	591420.72	5433.72	Lip of Gutter



10/17/2019 7:32:53 PM C:\p\work\den003\ch2\mhl_ab074278\00418232\001-YAL-RD_PLAN.dwg



Print Date: 10/17/2019
 File Name: R01-YAL-RD_PLAN.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman
JACOBS

Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

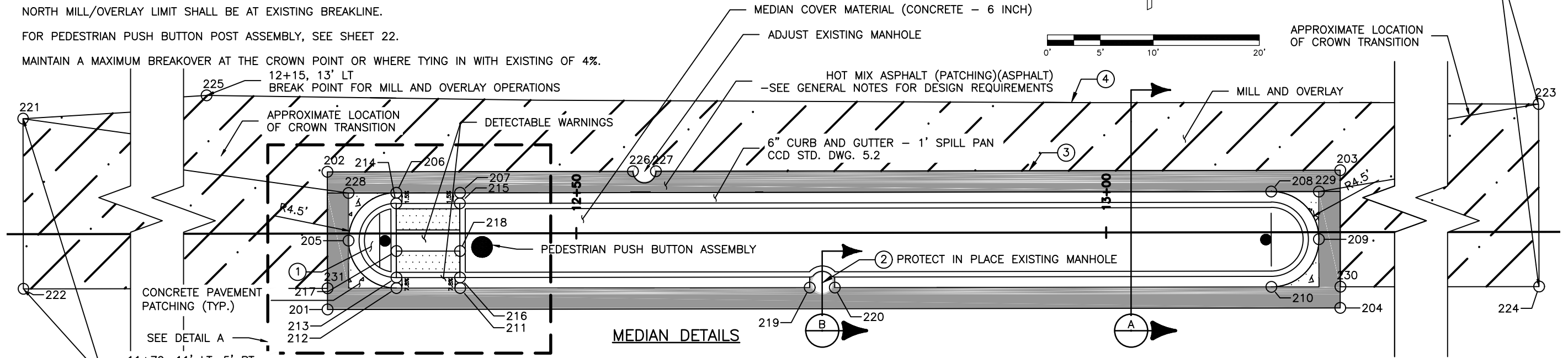
YALE STATION		
CURB RAMP DETAILS		
Designer:	SAB	Structure Numbers
Detailer:	SAB	
Sheet Subset:	ROADWAY	Subset Sheets: R03 of 7

Project Number
P0-00054216
Sheet Number
17

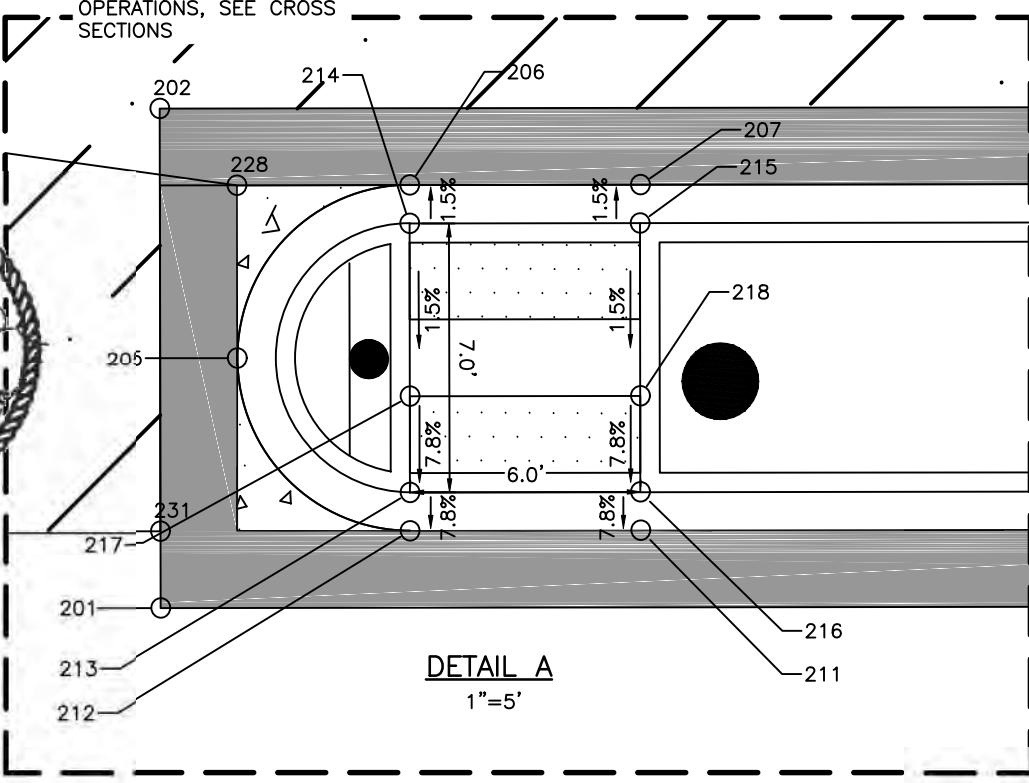
NOTES

- (1. CONSTRUCT MEDIAN NOSE AND MEDIAN COVER MATERIAL AS PER TRANSPORTATION STANDARDS AND CITY AND COUNTY OF DENVER LATEST EDITION STD. DWG. 5.6.
- (2. PROPOSED CURB SHALL NOT CONFLICT WITH EXISTING SOUTH SEWER MANHOLE. PAVE UP TO MANHOLE LID.
- (3. SAWCUTS SHALL BE MADE 2' FROM PROPOSED EDGE OF GUTTER WHERE APPLICABLE.
- (4. NORTH MILL/OVERLAY LIMIT SHALL BE AT EXISTING BREAKLINE.
5. FOR PEDESTRIAN PUSH BUTTON POST ASSEMBLY, SEE SHEET 22.
6. MAINTAIN A MAXIMUM BREAKOVER AT THE CROWN POINT OR WHERE TYING IN WITH EXISTING OF 4%.

13+70, 12' LT, 5' RT
END MILL AND OVERLAY
OPERATIONS, SEE CROSS SECTIONS



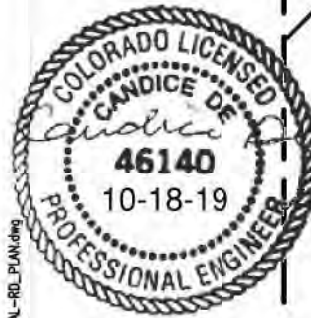
MEDIAN DETAILS



DETAIL A
1"=5'

MEDIAN POINT TABLE				
Point	Northing	Easting	Elevation	POINT DESCRIPTION
201	367998.94	591409.94	5433.6 ±	Match Existing
202	368011.94	591409.92	5434.02	Asphalt Patch
203	368012.08	591505.49	5436.02	Asphalt Patch
204	367999.08	591505.49	5435.5 ±	Match Existing
205	368005.44	591411.93	5433.93	Lip of Gutter
206	368009.95	591416.42	5434.18	Lip of Gutter
207	368009.96	591422.43	5434.27	Lip of Gutter
208	368010.07	591498.98	5435.89	Lip of Gutter
209	368005.58	591503.48	5435.72	Lip of Gutter
210	368001.07	591498.99	5435.50	Lip of Gutter
211	368000.96	591422.45	5433.95	Lip of Gutter
212	368000.95	591416.44	5433.85	Lip of Gutter
213	368001.95	591416.43	5433.94	Front of Ramp
214	368008.95	591416.42	5434.20	Front of Ramp
215	368008.96	591422.42	5434.29	Front of Ramp
216	368001.96	591422.43	5434.03	Front of Ramp

217	368004.45	591416.43	5434.13	Back of Ramp
218	368004.46	591422.43	5434.22	Back of Ramp
219	368001.01	591455.43	5434.58	Lip of Gutter - Adjacent to Manhole
220	368001.01	591457.80	5434.62	Lip of Gutter - Adjacent to Manhole
221	368016.93	591361.91	5432.9 ±	Match Existing
222	368000.87	591361.94	5432.8 ±	Match Existing
223	368018.38	591553.46	5437.0 ±	Match Existing
224	368001.16	591553.49	5436.8 ±	Match Existing
225	368019.16	591398.52	5433.7 ±	Match Existing
226	368011.99	591438.76	5434.61	Lip of Gutter - Adjacent to Manhole
227	368011.99	591440.92	5434.66	Lip of Gutter - Adjacent to Manhole
228	368009.94	591411.92	5434.10	Proposed Crown Transition Point
229	368010.08	591503.48	5435.99	Proposed Crown Transition Point
230	368001.08	591505.51	5435.6 ±	Match Existing
231	368000.94	591409.94	5433.7 ±	Match Existing



Know what's below.
Call before you dig.

Print Date: 10/17/2019
File Name: R01-YAL-RD_PLAN.dwg
Horiz. Scale: As Noted Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions			
Date:	Comments	Init.	



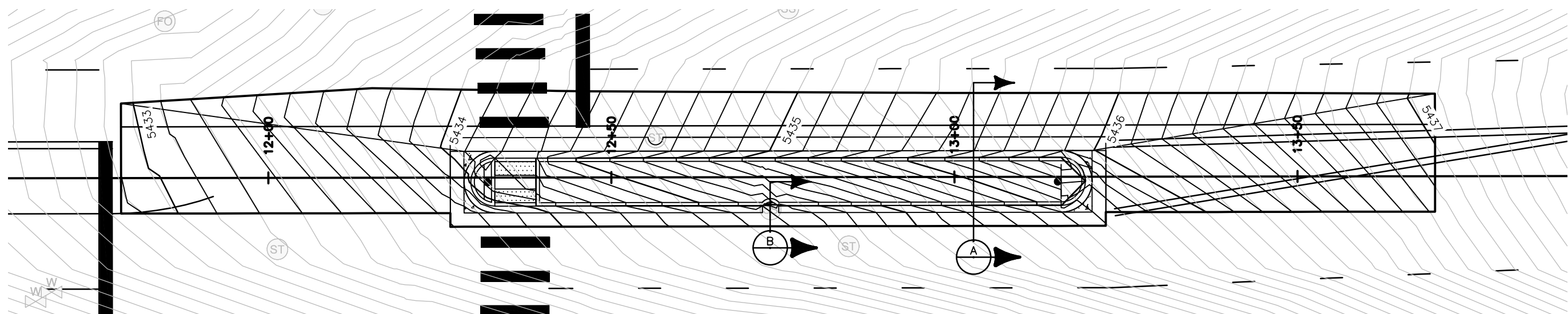
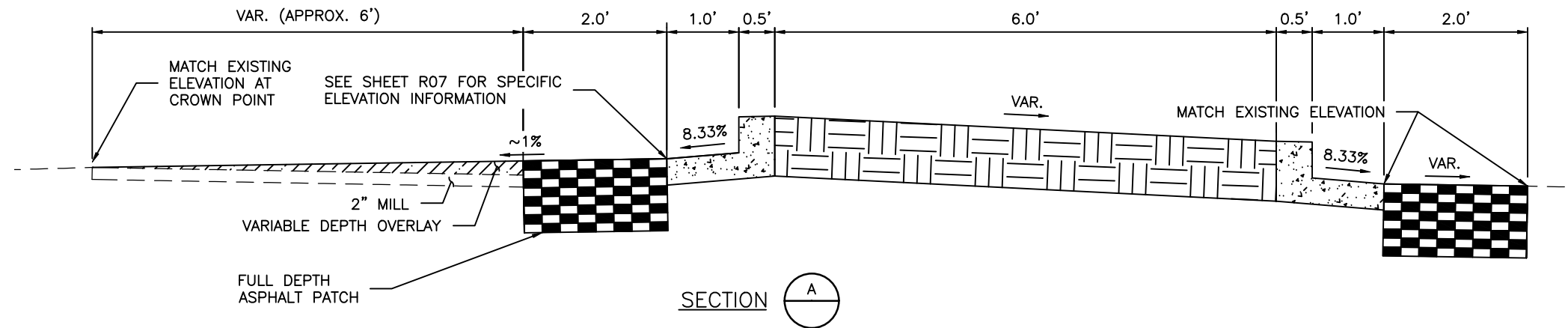
DEPARTMENT OF PUBLIC WORKS
201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

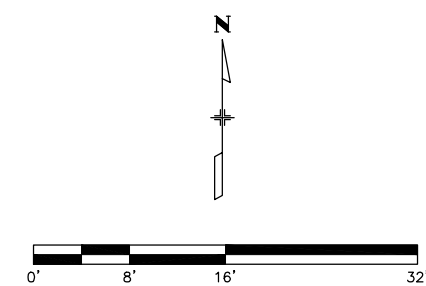
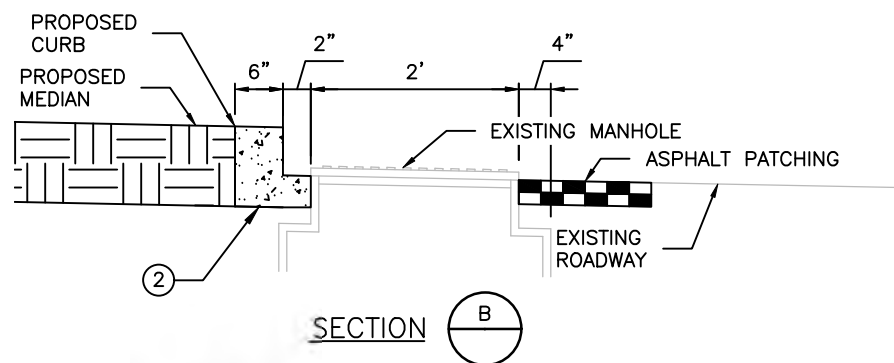
**YALE STATION
MEDIAN DETAILS
(1 OF 2)**
Designer: SAB
Detailer: SAB
Structure Numbers:
Sheet Subset: ROADWAY
Subset Sheets: R04 of 7

Project Number
P0-00054216
Sheet Number 18

10/17/2019 7:47:26 PM C:\p\work\den\den003\ch2\mhl_ab074278_00418232\001-YAL-RD_PLAN.dwg



PROPOSED MEDIAN/RESURFACING GRADING



Know what's below.
Call before you dig.

Print Date: 10/17/2019
 File Name: R01-YAL-RD_PLAN.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions		
Date:	Comments	Init.



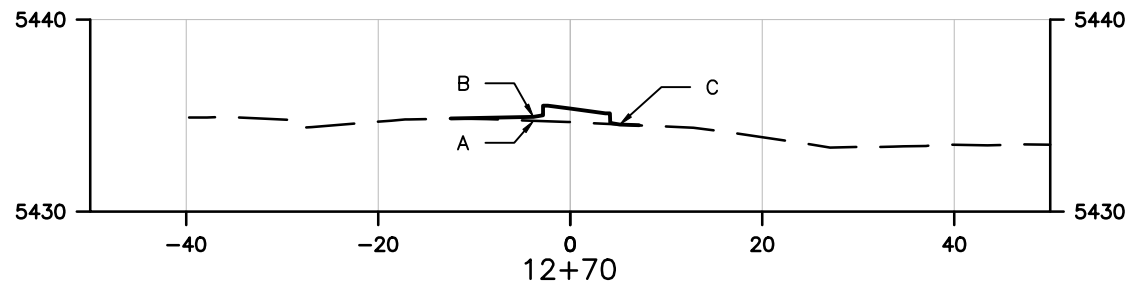
DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
 No Revisions:
 Revised:
 Void:

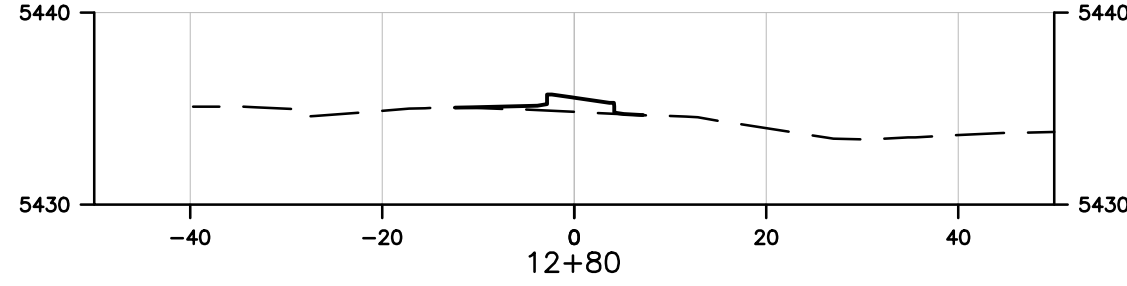
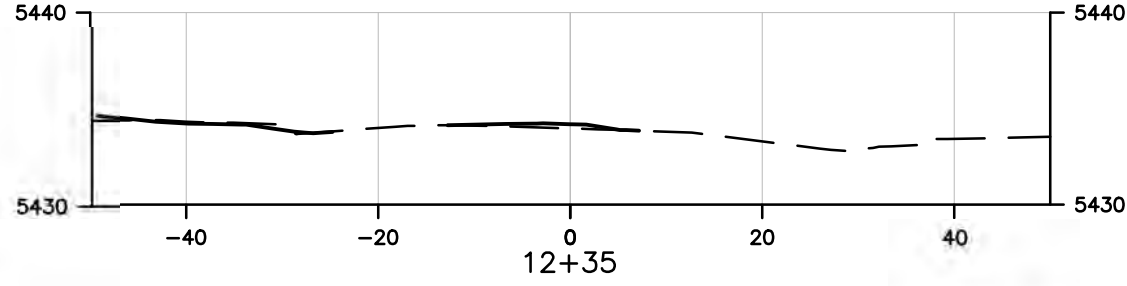
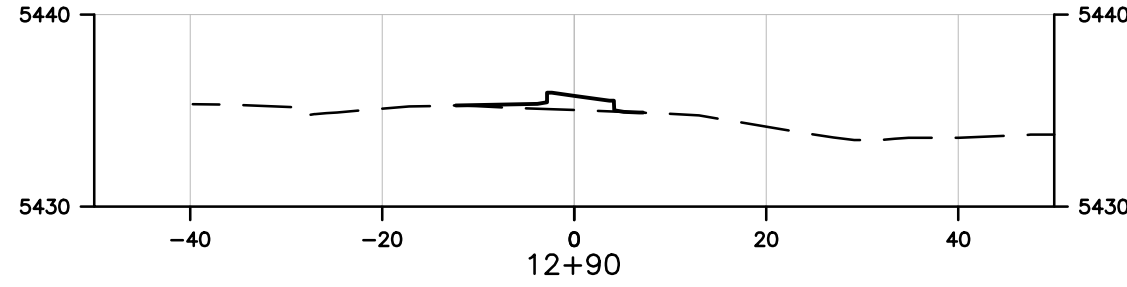
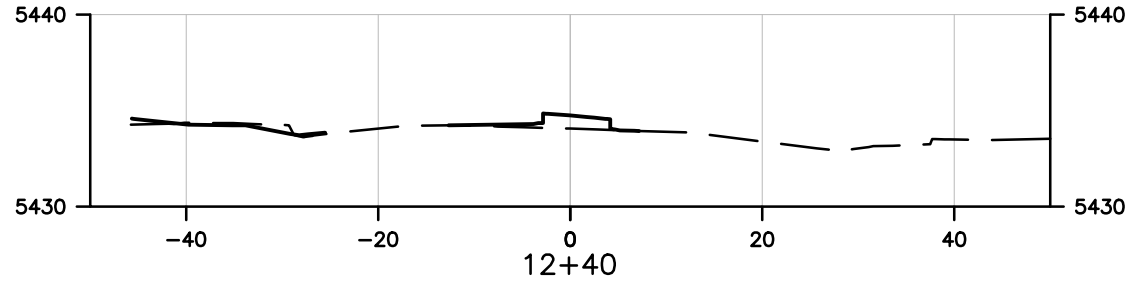
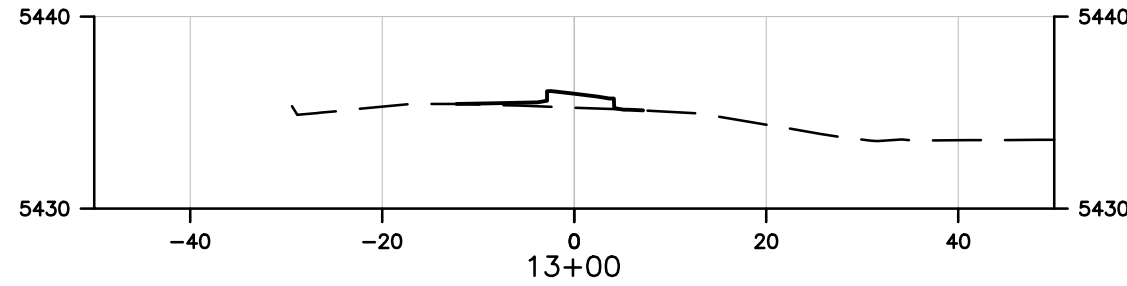
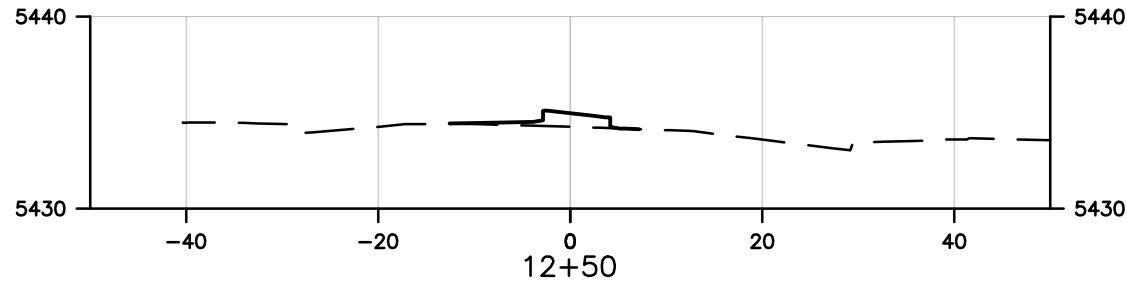
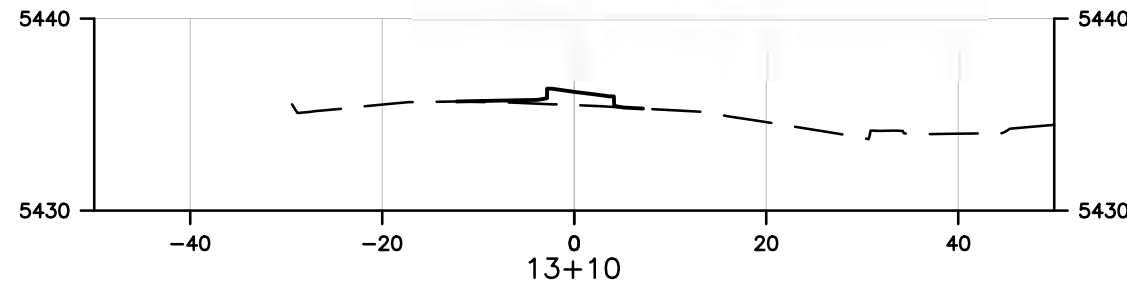
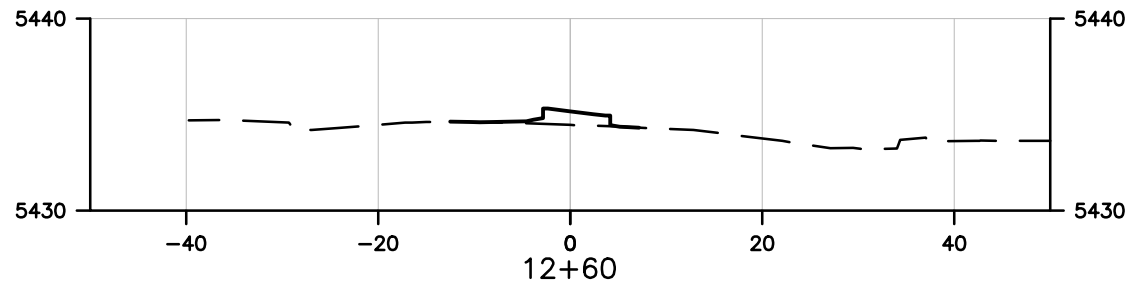
YALE STATION MEDIAN DETAILS (2 OF 2)			
Designer:	SAB	Structure Numbers	
Detailer:	SAB		
Sheet Subset:	ROADWAY	Subset Sheets:	R05 of 7

Project Number
 P0-00054216
 Sheet Number 19

10/17/2019 7:54:15 PM C:\p\workdir\den003\ch2mhill_ab074278\00418232\001-YAL-RD_PLAN.dwg



SEE SECTIONS POINT TABLE FOR SPECIFIC POINT ELEVATIONS



10/14/2019 5:00:02 PM C:\p\work\den003\c2\mhill_ab074278\00418232\101-YAL-RD_PLAN.dwg



Know what's below. Call before you dig.

Print Date: 10/14/2019
 File Name: R01-YAL-RD_PLAN.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman

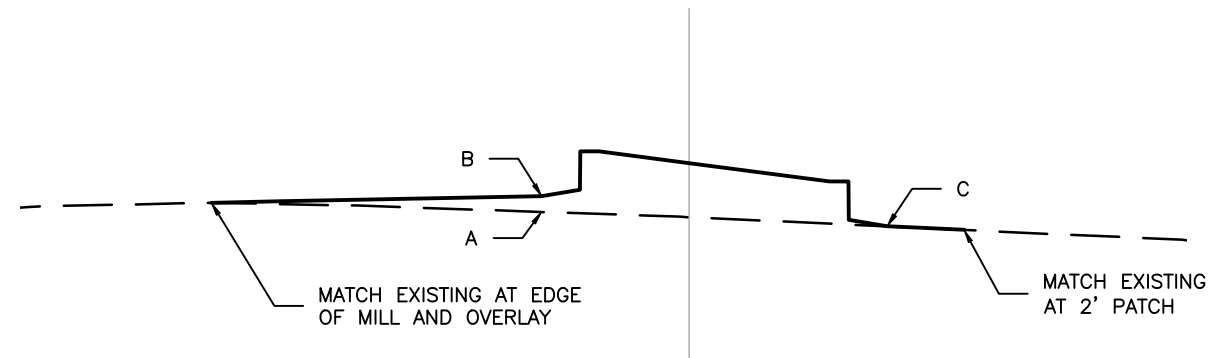


Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed	YALE STATION MEDIAN SECTIONS			Project Number
	No Revisions:	Designer: SAB	Structure Numbers	P0-00054216
Revised:	Detailer: SAB			
Void:	Sheet Subset: ROADWAY	Subset Sheets: R06 of 7	Sheet Number 20	



- A. EXISTING ELEVATION AT NORTH LIP OF GUTTER
- B. PROPOSED ELEVATION AT NORTH LIP OF GUTTER
- C. EXISTING ELEVATION/PROPOSED ELEVATION AT SOUTH LIP OF GUTTER

SECTIONS POINT TABLE							
Station	Point A/B Northing	Point A/B Easting	Point A Elevation	Point B Elevation	Point C Northing	Point C Easting	Point C Elevation
12+35	368009.95'	591418.41'	5434.03'	5434.21'	368000.95'	591418.43'	5433.89'
12+40	368009.96'	591423.41'	5434.12'	5434.31'	368000.96'	591423.43'	5433.97'
12+50	368009.98'	591433.41'	5434.32'	5434.52'	368000.98'	591433.43'	5434.18'
12+60	368009.99'	591443.41'	5434.53'	5434.73'	368000.99'	591443.43'	5434.37'
12+70	368010.01'	591453.41'	5434.73'	5434.94'	368001.01'	591453.43'	5434.54'
12+80	368010.02'	591463.41'	5434.92'	5435.14'	368001.02'	591463.43'	5434.71'
12+90	368010.04'	591473.41'	5435.10'	5435.35'	368001.04'	591473.43'	5434.93'
13+00	368010.05'	591483.41'	5435.33'	5435.54'	368001.05'	591483.43'	5435.16'
13+10	368010.07'	591493.41'	5435.57'	5435.76'	368001.07'	591493.43'	5435.37'



Know what's below.
Call before you dig.

10/15/2019 4:23:47 PM C:\p\workdir\den003\c12mhill_ab074278\00418232\001-YAL-RD-PLAN.dwg

Print Date: 10/15/2019	
File Name: R01-YAL-RD-PLAN.dwg	
Horiz. Scale: As Noted	Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman	
JACOBS	

Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed	YALE STATION			Project Number
	MEDIAN SECTIONS POINT TABLE			
No Revisions:				P0-00054216
Revised:	Designer: SAB	Structure Numbers		Sheet Number 21
Void:	Detailer: SAB			
	Sheet Subset: ROADWAY	Subset Sheets: R07 of 7		

TABULATION OF TRAFFIC SIGNAL ITEMS

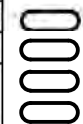
ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	NOTES
503-00024	Drilled Caisson (24 Inch)	LF	7	Traffic signal light pole steel no mast arm
503-00036	Drilled Caisson (36 Inch)	LF	39	
613	Electric Meter Pedestal Cabinet and Base	Each	1	Includes foundation
613-00206	2 Inch Electrical Conduit (Bored)	LF	195	
613-00306	3 Inch Electrical Conduit (Bored)	LF	365	
613-01200	2 Inch Electrical Conduit (Plastic)	LF	115	
613-01300	3 Inch Electrical Conduit (Plastic)	LF	185	
613-07000	Pull Box (Special)	Each	3	Controller & Fiber Optic
613-07002	Type Two Pull Box	Each	4	Electric
613-07003	Type Three Pull Box	Each	5	Traffic
613-10000	Wiring	LS	1	
613-13000	Luminaire (LED)	Each	4	5300 Lumens
614-00011	Sign Panel (Class I)	SF	14	
614-00012	Sign Panel (Class II)	SF	28	
614-70150	Pedestrian Signal Face (16) (Countdown)	Each	4	
614-70336	Traffic Signal Face (12-12-12)	Each	8	
614-70448	Traffic Signal Face (12-12-12-12)	Each	2	
614-72855	Traffic Signal Controller and Cabinet	Each	1	
614-72860	Pedestrian Push Button and Indication Sign	Each	3	
614-72863	Pedestrian Push Button Post Assembly	Each	2	Includes foundation
614-72866	Fire Preemption Unit and Timer	Each	3	
614-72895	Intersection Detection System (FLIR Camera)	Each	2	
614-81000	Traffic Signal-Light Pole Steel (No Mast Arm)	Each	1	NE Corner
614-81120	Traffic Signal Light Pole Steel (1-20 Foot Mast Arm)	Each	2	NW Corner and SW Corner
614-81140	Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm)	Each	1	SE Corner
614-86105	Telemetry (Field)	Each	1	
614-86800	Uninterrupted Power Supply	Each	1	
614-87333	Closed Circuit Television Camera (Traffic Monitoring)	Each	1	Pan-Tilt-Zoom Camera
614-87406	Fiber Optic Cable (Single Mode) (6 Strands)	LF	75	For information only; paid for as part of Telemetry (Field) item
614-87407	Fiber Optic Cable (Multi Mode) (6 Strands)	LF	75	For information only; paid for as part of Telemetry (Field) item
614-87690	Ethernet Managed Switch	Each	1	

LEGEND	
KEY	ITEM
3A	INSTALL TRAFFIC SIGNAL HEADS (12-12-12)
3A	INSTALL TRAFFIC SIGNAL HEADS (12-12-12-12)
3A	INSTALL PEDESTRIAN SIGNAL HEADS (COUNTDOWN)
3B	INSTALL SIGNAL CABINET, CONTROLLER, AND ASSOCIATED EQUIPMENT
3C	INSTALL PUSH BUTTON AND INDICATION SIGN
3D	INSTALL 2-INCH CONDUIT
3D	INSTALL 3-INCH CONDUIT
3E	INSTALL SIGNAL POLE
3F	(P) INSTALL PEDESTRIAN PUSH BUTTON POST ASSEMBLY
3F	INSTALL MAST ARM (LENGTH AS SHOWN)
3H	(SPECIAL) INSTALL PULL BOX MARKED "TRAFFIC COMM" ON LID
3H	(1) INSTALL ONE PULL BOX MARKED "TRAFFIC" ON LID
3H	(2) INSTALL TWO PULL BOXES ONE MARKED "TRAFFIC" & ONE MARKED "ELECTRIC" ON LIDS
3L	ELECTRIC COMPANY TO INSTALL POWER FEED TO ELECTRIC METER PEDESTAL CABINET. CONTRACTOR TO INSTALL ELECTRIC METER PEDESTAL AND EXTEND POWER FEED FROM METER PEDESTAL TO CONTROLLER
3M	INSTALL LUMINAIRE (LED 5300 LUMENS)
3T	INSTALL FIRE PREEMPTION UNIT AND TIMER
3V	INSTALL VIDEO DETECTION SYSTEM (FLIR CAMERA)
3V	(CCTV) INSTALL CLOSED CIRCUIT TELEVISION CAMERA
3W	INSTALL ELECTRIC METER
3Y	INSTALL SIGN PANEL (CLASS I)
3Y	INSTALL SIGN PANEL (CLASS II)



Know what's below.
Call before you dig.

Print Date: 9/18/2019
 File Name: T01-YAL-SIG-LEGEND_TAB.dwg
 Horiz. Scale: As Noted Vert. Scale: As Noted
 City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions		
Date:	Comments	Init.



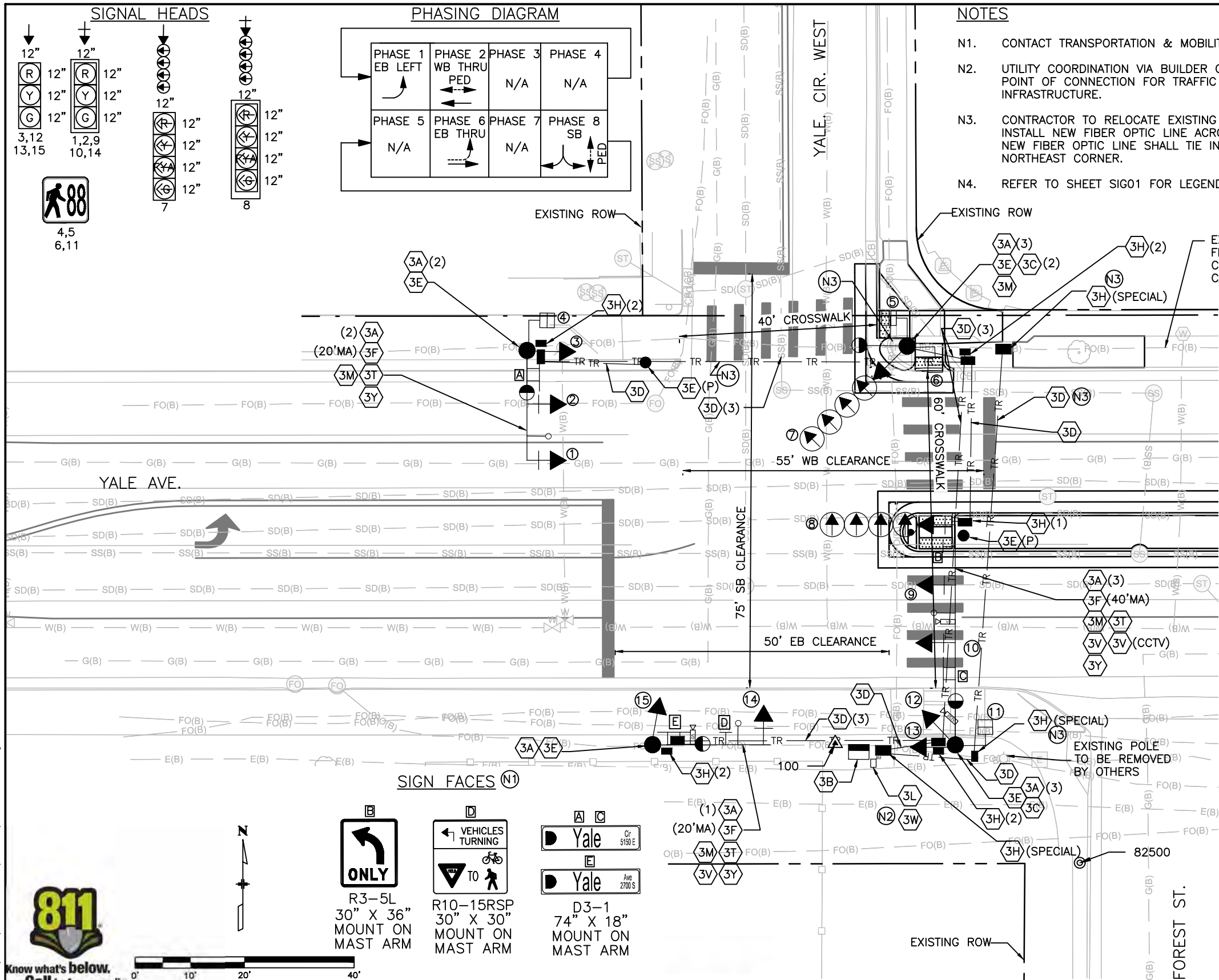
DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

YALE STATION TRAFFIC SIGNAL LEGEND AND TABULATION			
Designer:	JDB	Structure Numbers	
Detailer:	JDB		
Sheet Subset:	SIGNAL	Subset Sheets: SIG01 of	2

Project Number
P0-00054216
Sheet Number
22

9/18/2019 11:38:08 AM C:\pwworkdir\den003\ch2mhill_s0074278\00418232\T01-YAL-SIG-LEGEND_TAB.dwg



- NOTES**
- N1. CONTACT TRANSPORTATION & MOBILITY BEFORE SIGN FABRICATION AT 720-865-4000.
 - N2. UTILITY COORDINATION VIA BUILDER CALL LINE IS REQUIRED WITH XCEL ENERGY TO DETERMINE POWER POINT OF CONNECTION FOR TRAFFIC CONTROL EQUIPMENT AS WELL AS FUTURE XCEL ENERGY INFRASTRUCTURE.
 - N3. CONTRACTOR TO RELOCATE EXISTING CCD FIBER OPTIC LINE ACROSS YALE AVENUE. CONTRACTOR TO INSTALL NEW FIBER OPTIC LINE ACROSS YALE AVENUE TO NEW PULL BOX IN SOUTHEAST CORNER. NEW FIBER OPTIC LINE SHALL TIE INTO RELOCATED EXISTING FIBER OPTIC LINE AT NEW PULL BOX IN NORTHEAST CORNER.
 - N4. REFER TO SHEET SIG01 FOR LEGEND AND TABULATIONS.



811
Know what's below.
Call before you dig.

- SIGN FACES (N1)**
- R3-5L
30" X 36"
MOUNT ON MAST ARM
 - R10-15RSP
30" X 30"
MOUNT ON MAST ARM
 - D3-1
74" X 18"
MOUNT ON MAST ARM

Print Date: 9/23/2019
File Name: T02-YAL-SIG_PLAN.dwg
Horiz. Scale: As Noted Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman

JACOBS

Sheet Revisions		
Date:	Comments	Init.

DENVER
THE MILE HIGH CITY

DEPARTMENT OF PUBLIC WORKS
201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

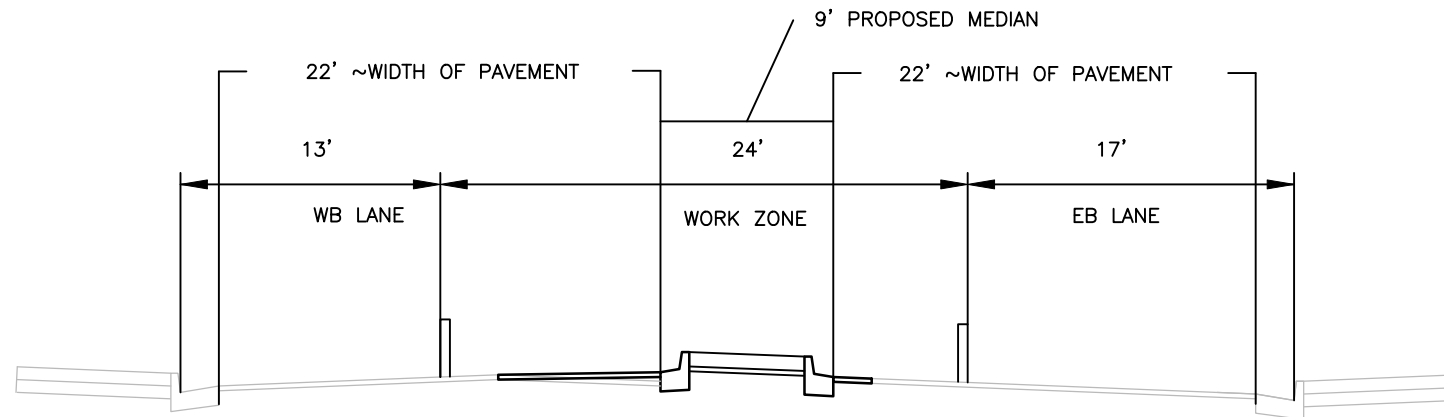
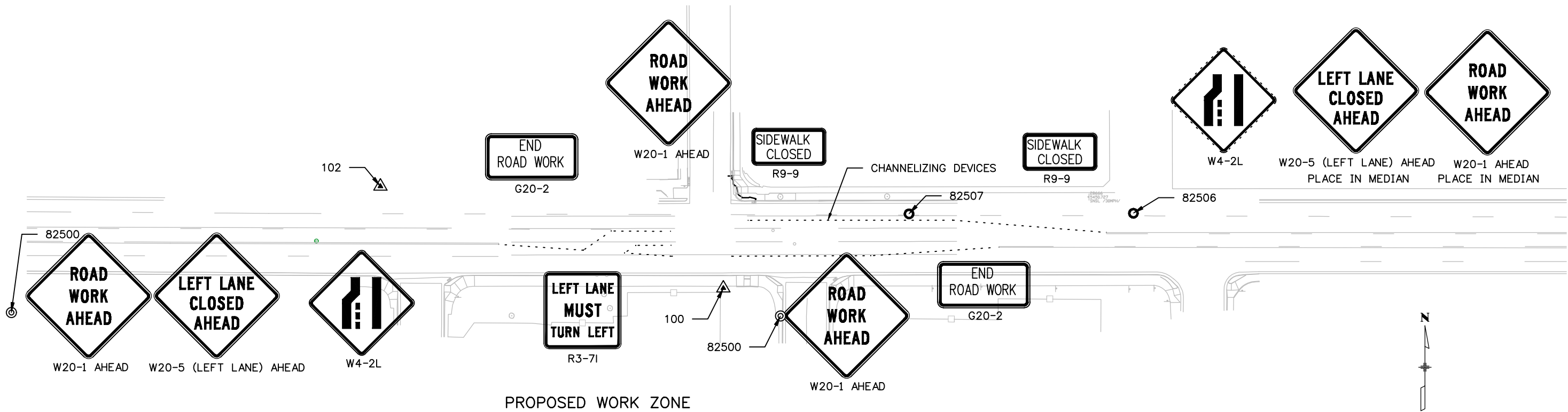
YALE STATION		
TRAFFIC SIGNAL PLAN		
Designer:	JDB	Structure Numbers
Detailer:	JDB	
Sheet Subset:	SIGNAL	Subset Sheets: SIG02 of 2

Project Number
P0-00054216
Sheet Number
23

9/23/2019 1:03:39 PM C:\pwworking\dem003\ch2mill_s074278_d0418232\T02-YAL-SIG_PLAN.dwg

CONSTRUCTION PHASING NOTES:

1. CONSTRUCTION PHASING SHOWN IS SUGGESTED BUT WILL BE CONFIRMED BY CONTRACTOR.
2. ALL SIGNS, BARRICADES, LIGHTS, OR OTHER DEVICES NECESSARY FOR SAFE TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND AS MODIFIED BY THE COLORADO SUPPLEMENT TO THE MUTCD. A METHOD OF HANDLING TRAFFIC SHALL BE SUBMITTED TO AND APPROVED BY THE CITY AND COUNTY OF DENVER PUBLIC WORKS DEPARTMENT PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMITS FOR WORK WITHIN THE CITY RIGHT OF WAY.
3. SHOULDER WORK WILL BE REQUIRED. W21-5 SIGNS SHOULD BE PLACED PRIOR TO SHOULDER WORK.



10/15/2019 3:51:40 PM C:\p\workdir\den003\c22mhill_ab074278\00418232\TC01-YAL-TRAF_CTRL_PLAN.dwg

Print Date: 10/15/2019	Sheet Revisions		<p>DEPARTMENT OF PUBLIC WORKS 201 WEST COLFAX AVENUE DENVER, CO 80202 PHONE: (720) 913-4501 FAX: (720) 913-4544</p>	As Constructed No Revisions: Revised: Void:	YALE STATION TRAFFIC CONTROL PLAN		Project Number
File Name: TC01-YAL-TRAF_CTRL_PLAN.dwg	Date:	Comments:			Init.:	Designer: CD	Structure Numbers
Horiz. Scale: As Noted				Detailer: SAB			
City Project Manager: Morgan Whitcomb & Emily Cushman				Sheet Subset: TRAF CONTROL	Subset Sheets: TC01 of 1	Sheet Number	24



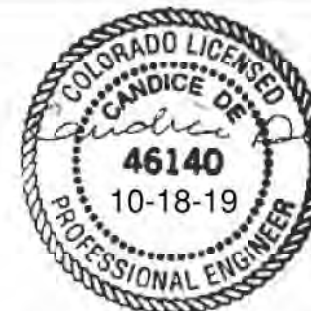
GENERAL UTILITY NOTES

- THE SUBSURFACE UTILITIES SHOWN HAVE BEEN INVESTIGATED AND DEPICTED IN ACCORDANCE WITH CI/ASCE 38-02 STANDARDS AND QUALITY LEVELS.
CI/ASCE 38-02 QUALITY LEVELS:
 D (QLD) – INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.
 C (QLC) – INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO QLD INFORMATION.
 B (QLB) – INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. THE DESIGNATED POSITION IS SURVEYED APPLICABLE TOLERANCES DEFINED BY THE PROJECT.
 A (QLA) – PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES USUALLY AT A SPECIFIC POINT.
- RELIANCE UPON THE INFORMATION FOR RISK MANAGEMENT PURPOSES DOES NOT RELIEVE ANY PARTY FROM FOLLOWING ALL APPLICABLE UTILITY DAMAGE PREVENTION STATUTES, POLICIES AND/OR INDUSTRY BEST PRACTICES.
- UTILITY MAPPING FIELD SERVICES WERE COMPLETED BETWEEN DECEMBER 2018 THRU MARCH 2019. UTILITIES MAY HAVE BEEN ADJUSTED OR ADDED AFTER THIS DATE.
- PRIOR TO DATE OF CONSTRUCTION CONTRACTOR SHALL VERIFY EXISTING UTILITIES WITH THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AND/OR UTILITY COMPANIES. FOR ADDITIONAL INFORMATION CONTACT: UNCC 1-800-922-1987. THE CONTRACTOR SHALL VERIFY EXISTENCE, SIZE, AND LOCATION OF EXISTING UTILITIES AND FACILITIES PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT ALL UTILITIES TO COORDINATE SCHEDULING. SHOULD ANY CONFLICTS, RECONSTRUCTION, OR OTHER INTERRUPTIONS IN SERVICE BE REQUIRED, CONTRACTOR SHALL COORDINATE UTILITY SCHEDULING.
- THE CONTRACTOR SHALL CORRECTLY SHOW ON SUBMITTED DRAWINGS THE LOCATIONS OF ALL UTILITIES IN THE VICINITY WHERE THE CONTRACTOR MAY BORE, TRENCH, EXCAVATE, AND INSTALL CONDUIT, FIBER, FIBER ENCLOSURES, VAULTS, AND HANDHOLDS. IN THE EVENT THAT THE CONDUIT RUN, FIBER ENCLOSURES, VAULTS, OR HANDHOLDS ARE LOCATED WITHIN THE VICINITY OF ANY UTILITY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION THAT WILL PREVENT DAMAGE TO THE INSTALLATION UNDER NORMAL UTILITY OPERATING CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN INFORMATION ON EACH OF THE UTILITIES AS APPLICABLE SUCH AS GAS PRESSURE, STEAM AND WATER PRESSURES, TEMPERATURES, ETC.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE SITE FOR EVIDENCE OF FAILURES OF OR DEFICIENCIES IN UTILITY COMPANY FACILITIES (I.E. XCEL, DENVER WATER, DENVER PUBLIC WORKS, WMD, ETC.) AND TO IMMEDIATELY CALL ANY SUCH EVIDENCE OF PRE-EXISTING DAMAGE TO THE ATTENTION OF THE UTILITY COMPANY ALONG WITH PROPER DOCUMENTATION. THE CONTRACTOR HEREBY AGREES THAT THE REPAIR OF ANY AND ALL DAMAGES (DIRECT OR INDIRECT), THAT MAY BE SUBSEQUENTLY DISCOVERED AND PROVEN TO HAVE BEEN CAUSED BY THE CONSTRUCTION ACTIVITIES, IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR WITHOUT SUCH EVIDENCE OF PRE-EXISTING DAMAGE. THE CONTRACTOR HEREBY AGREES THAT ANY AND ALL DAMAGES (DIRECT OR INDIRECT) TO UTILITY COMPANY FACILITIES, WHICH MAY BE SUBSEQUENTLY DISCOVERED WITHIN THOSE AREAS WHERE CONSTRUCTION OCCURRED WITHIN SIX FEET OF UTILITY COMPANY FACILITIES (DIRECT OR INDIRECT), AND WITHIN A PERIOD OF THREE YEARS FROM THE DATE OF CONSTRUCTION, WERE CAUSED BY THE CONSTRUCTION ACTIVITIES. FURTHERMORE, THE REPAIR IS AGREED TO BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL UTILITY COMPANY FACILITIES WITHIN THE AREA OF CONSTRUCTION. THIS INCLUDES ALL STEPS NECESSARY TO PREVENT SUBSIDENCE OF THE SOIL ADJACENT TO OR NEAR UTILITY COMPANY FACILITIES.
- ANY CASING OR SLEEVE INSTALLED UNDER THE ROADWAY SHALL BE THE SAME DIAMETER AS THE BORE SO AS TO ELIMINATE A VOID AROUND THE CASING. IN THE EVENT JACKING OPERATIONS RESULT IN VOIDS, THE RESULTANT VOIDS SHALL BE GROUTED OR OTHERWISE BACKFILLED, SUBJECT TO CITY APPROVAL. ENDS OF BORED SECTIONS SHALL NOT BE COVERED BEFORE BEING INSPECTED.
- THE CONTRACTOR SHALL MAINTAIN AT LEAST A 10 FOOT CLEAR ZONE TO UTILITIES AT ALL TIMES IN ACCORDANCE WITH CITY STANDARDS. THE CONTRACTOR SHALL CLEARLY IDENTIFY OWNER NAME AND CONTACT INFORMATION ON ALL MANHOLE COVERS.
- THE CONTRACTOR SHALL COORDINATE WITH XCEL ENERGY PRIOR TO WORKING UNDER OVERHEAD UTILITIES.
- THE CONTRACTOR SHALL KEEP REQUIRED MINIMUM CLEARANCE FROM ALL OVERHEAD UTILITIES DURING CONSTRUCTION ACTIVITIES.

UTILITY CONTACT LIST

Utility Owner	Contact Name/Email	Phone/Fax
CenturyLink & Level 3	Jim Elkins James.Elkins@CenturyLink.com Thomas Longan thomas.longan@centurylink.com	720-545-6037 (Jim) 303-482-9822 (Tom)
Comcast	Kip West Kip_West@comcast.com	303-603-2832 (Office) 720-347-9992 (Cell)
Denver Public Works Transportation & Mobility Fiber Optic	Chad Tavelli chad.tavelli@denvergov.org	720-448-6700 (Cell) 303-827-4472 (Work Cell) 720-377-2914 (Office)
Denver Public Works Transportation & Mobility Traffic	Amy Rens Amy.Rens@denvergov.org	720-865-3177
Denver Public Works Wastewater Management Division	Todd Johnson Todd.Johnson2@denvergov.org	(720) 865-3120 (Office) (503) 482-8533 (Cell)
Denver Water	Paul Peloquin paul.peloquin@denverwater.org Ray Batts Rapheal.Batts@denverwater.org	303-628-6620 (Paul) 303-628-6682 (Ray)
MCI-Verizon Fiber	Steve Valdez (Engineer - West Field Engineering - CO) steve.g.valdez@one.verizon.com David McCallister (Engineer - West Field Engineering - CO) david.mcallister@one.verizon.com Greg Fritz (Engineer - West Field Engineering - CO) greg.fritz@one.verizon.com (Note: Contact the above three contacts for MCI, Verizon, and XO utilities)	303-539-1022 (Steve, Cell) 303-435-2793 (Steve, Office) 303-214-7115 (David, Office) 801-301-0937 (David, Cell) 303-539-3238 (Greg, Office) 303-961-3140 (Greg, Cell)
Metro Wastewater Reclamation District	Jim Malloreay JMalloreay@mwrd.dst.co.us	303-286-3487 (Office) 303-549-8397 (Cell)
Xcel Energy (Electric & gas)	Mickie Ford Michelle.Ford@XCELENERGY.COM	303-898-8001 (Office)
Zayo Group	Jeramie Trotter jeramie.trotter@zayo.com	406-209-7259

Note: Updated on 09/17/2019



Know what's below.
Call before you dig.

Print Date: 9/18/2019
File Name: U01-YAL-UT_PLAN.dwg
Horiz. Scale: As Noted Vert. Scale: As Noted
City Project Manager: Morgan Whitcomb & Emily Cushman



Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS

201 WEST COLFAX AVENUE
DENVER, CO 80202
PHONE: (720) 913-4501
FAX: (720) 913-4544

As Constructed	YALE STATION UTILITY GENERAL NOTES AND CONTACT LIST		Project Number
No Revisions:			PO-00054216
Revised:	Designer: C. SNYDER	Structure Numbers	Sheet Number 25
Void:	Detailer: C. SNYDER		
Sheet Subset: UTILITIES		Subset Sheets: U01 of U02	

9/18/2019 11:41:14 AM C:\pwworkdir\den003\ch2mhill_s0074278\00418232\U01-YAL-UT_PLAN.dwg

UTILITY LEGEND

EXISTING

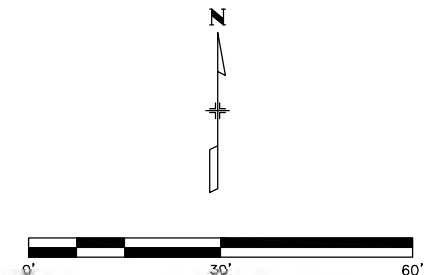
- W(QL) — EXISTING WATER
- G(QL) — EXISTING GAS
- E(QL) — EXISTING UG ELECTRIC
- C(QL) — EXISTING COMMUNICATIONS
- FO(QL) — EXISTING FIBER OPTIC
- SS(QL) — EXISTING SANITARY SEWER
- SD(QL) — EXISTING STORM SEWER

NOTE: (QL) = CI/ASCE 38-02 QUALITY LEVELS (A, B, C, D), TYP.

- W (W) EXISTING WATER WELL
- W (V) EXISTING WATER VALVE
- F (H) EXISTING FIRE HYDRANT
- E (E) EXISTING ELECTRIC LIGHT BOX
- E (M) EXISTING ELECTRIC METER
- C (C) EXISTING COMMUNICATIONS BOX
- T (T) EXISTING TELEPHONE COMMUNICATIONS BOX
- FO (M) EXISTING FIBER OPTIC MANHOLE OR PULLBOX
- E (E) EXISTING ELECTRIC BOX
- U (P) EXISTING UTILITY POLE WITH LIGHT
- SS (M) EXISTING SANITARY SEWER MANHOLE
- SS (C) EXISTING SANITARY SEWER CLEANOUT
- ST (M) EXISTING STORM SEWER MANHOLE
- CB (I) EXISTING STORM INLET

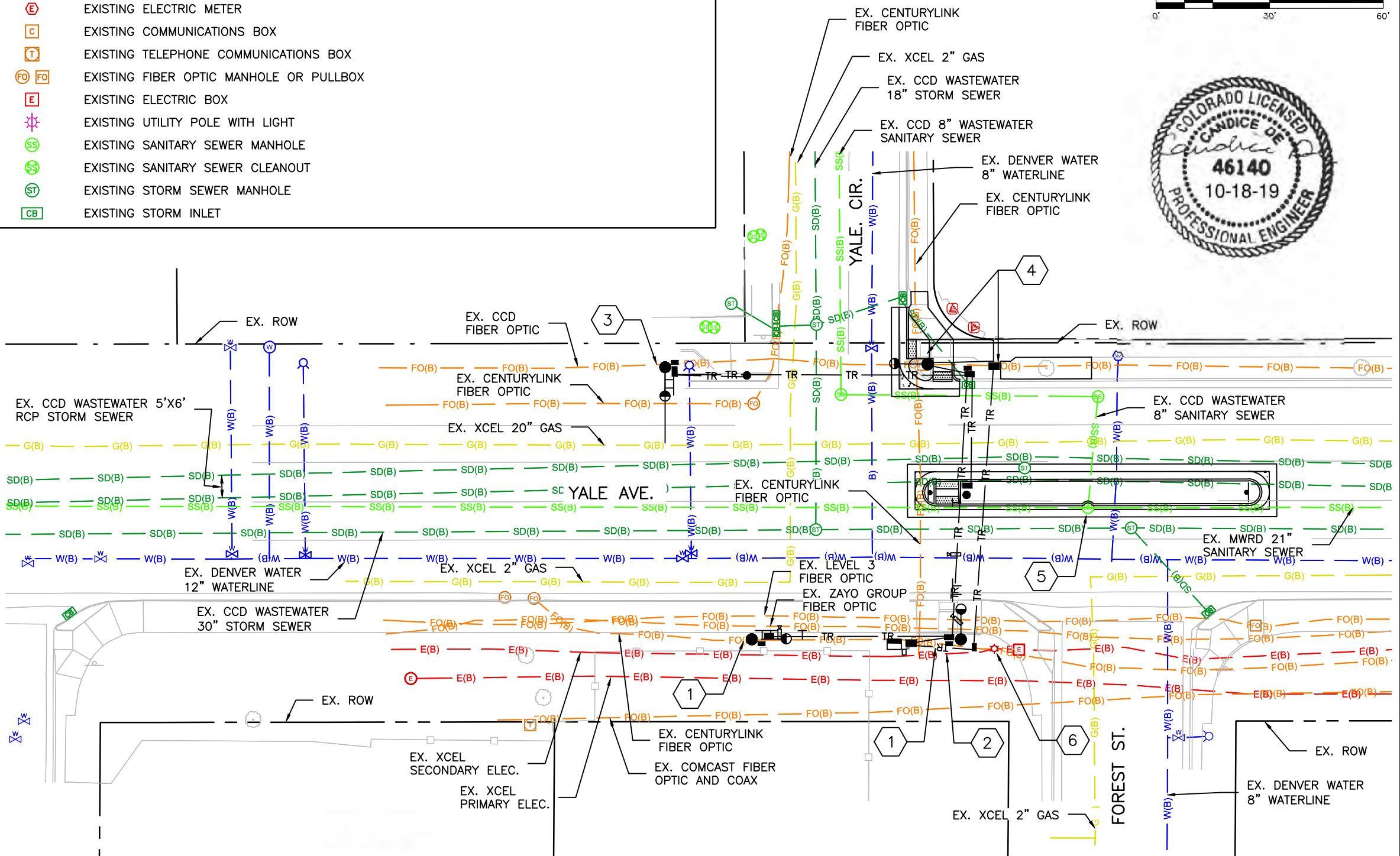
PROPOSED

- TR — PROPOSED TRAFFIC CONDUIT
- — PROPOSED TRAFFIC SIGNAL POLE
- — PROPOSED TRAFFIC PULL BOX



NOTES

- 1 UTILITY CONFLICT WITH CENTURYLINK FIBER OPTIC LINE. CENTURYLINK TO ADJUST AS NECESSARY.
- 2 XCEL ELECTRIC POWER SOURCE FOR TRAFFIC SIGNAL TO BE CONFIRMED. XCEL ENERGY TO ADJUST AS NECESSARY.
- 3 CCD FIBER OPTIC TO BE RELOCATED BY CONTRACTOR TO AVOID PROPOSED TRAFFIC SIGNAL POLE FOUNDATION.
- 4 CCD FIBER OPTIC AND PULL BOX TO BE RELOCATED BY CONTRACTOR PER THE DIRECTION OF CCD TO AVOID THE PROPOSED TRAFFIC SIGNAL POLE FOUNDATION. THE PROPOSED UTILITY RELOCATION WORK WILL BE PAID FOR UNDER ITEM 210 RESET WIRING - FIBER OPTIC. SEE TRAFFIC SIGNAL PLAN FOR ADDITIONAL INFORMATION ON PULL BOX LOCATION.
- 5 DENVER WASTEWATER & METRO WASTEWATER MANHOLE. SEE ROADWAY DETAILS FOR PROPOSED CURB DETAILS AROUND EXISTING MANHOLE.
- 6 XCEL LIGHT POLE AND FOUNDATION TO BE REMOVED BY XCEL ENERGY. EXISTING LIGHT POLE LUMINAIRE TO BE INSTALLED ON PROPOSED TRAFFIC SIGNAL POLE BY CONTRACTOR PER DIRECTION OF XCEL ENERGY.



9/18/2019 2:40:40 PM C:\pwworkdir\den003\ch2mhill_s074278_d0418232\U01-YAL-UT_PLAN.dwg



0000

Sheet Revisions		
Date:	Comments	Init.



DEPARTMENT OF PUBLIC WORKS
 201 WEST COLFAX AVENUE
 DENVER, CO 80202
 PHONE: (720) 913-4501
 FAX: (720) 913-4544

As Constructed
No Revisions:
Revised:
Void:

YALE STATION UTILITY PLAN		
Designer:	C. SNYDER	Structure Numbers
Detailer:	C. SNYDER	
Sheet Subset:	UTILITIES	Subset Sheets: U02 of U02

Project Number
P0-00054216
Sheet Number 26