

CITY AND COUNTY OF DENVER

STATE OF COLORADO



DEPARTMENT OF PUBLIC WORKS / «DIVISION»

Contract Documents For

SHE 2011 PKG 2 – TRAFFIC SIGNAL UPGRADE

Contract No. 201207522



DENVER
THE MILE HIGH CITY

Department of Public Works
Engineering Division

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

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

NOTICE OF APPARENT LOW BIDDER

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

The MANAGER OF PUBLIC WORKS has considered the Bids submitted on **September 26, 2012**, for work to be done and materials to be furnished in and for:

CONTRACT NO 201207522 – SHE 2011 PKG 2 TRAFFIC SIGNAL UPGRADE

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: **202-00019 through 700-70592 (Eighty Seven [87] total bid items)**, the total estimated cost thereof being: **One Million Five Hundred Eight Thousand Three Hundred Eighty Four Dollars and No Cents (\$1,508,384.00).**

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

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

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

All construction Contracts made and entered into by the City and County of Denver are subject to Affirmative Action and Equal Opportunity Rules and Regulations, as adopted by the Manager of Public Works, and each contract requiring payment by the City of one-half million dollars (\$500,000.00) or more shall first be approved by the City Council acting by ordinance and in accordance with Section B1.12.2 of the Charter of the City and County of Denver.

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



Protecting the Present & Building the Future
Accountability, Innovation, Empowerment, Performance, Integrity,
Diversity, Teamwork, Respect, Excellence, Safety

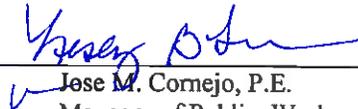
NOTICE OF APPARENT LOW BIDDER
PROJECT NO. 201207522
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The Bid Security submitted with your Bid, will be returned upon execution of the Contract and furnishing of the Performance Bond. In the event you should fail to execute the Contract and to furnish the performance Bond within the time limit specified, said Bid Security will be retained by the City and County of Denver as liquidated damages, and not as a penalty for the delay and extra work caused thereby.

Dated at Denver, Colorado this 29th day of Nov 2012.

CITY AND COUNTY OF DENVER

By



Jose M. Cornejo, P.E.
Manager of Public Works

JC/joa

cc: H. Bright(CAO), Gallagher (AUD), Schellinger (Treasury/Tax Compliance), Jessica Encinias-DSBO,
John Yu, File

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

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

BIDDER'S CHECKLIST

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

FORM/ PAGE NO.	COMMENTS	COMPLETE
BF-4 – BF-5	a.) Acknowledgment signature and attestation required.	<input type="checkbox"/>
BF-6+	a.) Fill in individual bid item dollars and totals in Numerical figures only	<input type="checkbox"/>
	b.) Complete all blanks	<input type="checkbox"/>
BF-7	a.) Write out bid total or bid totals in words and figures in the blank form space(s) provided	<input type="checkbox"/>
BF-8	a.) List all subcontractors who are performing work on this project	<input type="checkbox"/>
BF-9 – BF-10	a.) Fully complete List of Proposed Disadvantaged Business Enterprise Bidders, Subcontractors, Suppliers, Manufacturers, or Brokers – check appropriate boxes.	<input type="checkbox"/>
BF-11	a.) Complete all blanks	<input type="checkbox"/>
	b.) If Addenda have been issued, complete bottom section.	<input type="checkbox"/>
BF-12	a.) Complete appropriate sections - signature(s) required.	<input type="checkbox"/>
	b.) If corporation, then corporate seal required.	<input type="checkbox"/>
BF-13	a.) Fully complete Commitment to DBE Participation	<input type="checkbox"/>
BF-16	a.) If applicable, fully complete Joint Venture Affidavit	<input type="checkbox"/>
BF-17 – BF-19	a.) If applicable, fully complete Joint Venture Eligibility Form	<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 CE Number.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
BF-21 - BF-23	a.) Per form Instructions, fully complete the Bidder/Contractor/Vendor/Proposer Disclosure form as required by IB-24.	<input type="checkbox"/>
BF-24- BF-28	Complete all DBE forms, including: a.) Contractors Performance Capability Statement b.) Anti-Collusion Affidavit c.) Assignment of Anti-Trust Claims d.) Underutilized DBE Bid Conditions Assurance	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

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

BID FORM AND SUBMITTAL PACKAGE ACKNOWLEDGMENT

**CONTRACT NO. 201207522
FEDERAL AID PROJECT NOs. : SHE R600-391
SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE**

BIDDER: Sturgeon Electric Company, Inc.

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

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. 201207522, SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE, made available to the undersigned bidder pursuant to Notice of Invitation for Bids dated August 29, 2012.

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 Disadvantaged Business Enterprise(s)
- Commitment to Disadvantaged Business Enterprise Participation
- DBE Letter(s) of Intent
- Joint Venture Affidavit (if applicable)
- Joint Venture Eligibility Form (if applicable)
- Bid Bond
- Bidder / Contractor / Vendor / Proposer Disclosure Form

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

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

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

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

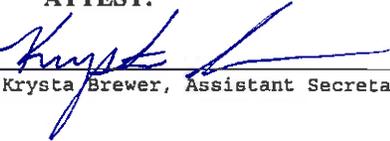
BIDDER:

Name: Sturgeon Electric Company, Inc.

By: 
Jeffrey Waneka

Title: Vice President

ATTEST:

By: 
Krysta Brewer, Assistant Secretary

[SEAL]

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

BID FORM

**CONTRACT NO. 201207522
FEDERAL AID PROJECT NOs. : SHE R600-391**

SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

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

BIDDER Sturgeon Electric Company, Inc.

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 **August 29, 2012**, to furnish all required materials, tools, appliances, equipment and plant; to perform all necessary labor and to undertake and complete: **SHE R600-391 CITY OF DENVER CONTRACT NO. 201207522, SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE** 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
Bid Bond
Addenda (as applicable)
DBE Documents
Equal Employment Opportunity Provisions
(Appendices A, B, E and F)
Bid Form
Commitment to DBE Participation
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
Contractors Performance Capability Statement
Anti-Collusion Affidavit
Assignment of Anti-Trust Claims
Underutilized DBE Bid Conditions Assurance
On-the-Job Training (where applicable)
Required Contract Provisions Federal Aid
Construction Contracts
Prevailing Wage Rate Schedule(s)
Technical Specifications
Contract Drawings
Accepted Shop Drawings
Certificate of Insurance

Item No.	Description and Price	Estimated Quantity	Estimated Cost
202-00019	Removal of Inlet at the unit price of \$ <u>1,085.00</u> per EACH.	2 EA	\$ <u>2,170.00</u>
202-00035	Removal of Pipe at the unit price of \$ <u>92.00</u> per LINEAR FOOT.	7 LF	\$ <u>644.00</u>
202-0008x	Removal of Bollard at the unit price of \$ <u>550.00</u> per EACH.	1 EA	\$ <u>550.00</u>
202-00190	Removal of Concrete Median Cover Material at the unit price of \$ <u>14.50</u> per SQUARE FOOT.	148 SY	\$ <u>2,146.00</u>
202-00200	Removal of Sidewalk at the unit price of \$ <u>13.50</u> per SQUARE FOOT.	326 SY	\$ <u>4,401.00</u>
202-00201	Removal of Curb at the unit price of \$ <u>28.50</u> per LINEAR FOOT.	13 LF	\$ <u>370.50</u>
202-00202	Removal of Gutter at the unit price of \$ <u>16.25</u> per LINEAR FOOT.	31 LF	\$ <u>503.75</u>
202-00203	Removal of Curb and Gutter at the unit price of \$ <u>16.00</u> per LINEAR FOOT.	728 LF	\$ <u>11,648.00</u>
202-00206	Removal of Concrete Curb Ramp at the unit price of \$ <u>14.50</u> per SQUARE YARD.	145 SY	\$ <u>2,102.50</u>
202-00210	Removal of Concrete Pavement at the unit price of \$ <u>16.00</u> per SQUARE YARD.	80 SY	\$ <u>1,280.00</u>
202-00220	Removal of Asphalt Mat at the unit price of \$ <u>25.00</u> per SQUARE YARD.	410 SY	\$ <u>10,250.00</u>
202-00810	Removal of Ground Sign at the unit price of \$ <u>205.00</u> per EACH.	12 EA	\$ <u>2,460.00</u>
202-00828	Removal of Traffic Signal Equipment at the unit price of \$ <u>22,500.00</u> per LUMP SUM.	1 LS	\$ <u>22,500.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
202-01000	Removal of Fence at the unit price of \$ <u>85.00</u> per LINEAR FOOT.	13 LF	\$ <u>1,105.00</u>
202-04003	Clean Culvert (Special) at the unit price of \$ <u>1235.00</u> per EACH.	12 EA	\$ <u>14,820.00</u>
203-01597	Potholing at the unit price of \$ <u>315.00</u> per EACH.	120 EA	\$ <u>37,800.00</u>
208-00045	Concrete Washout Structure at the unit price of \$ <u>570.00</u> per EACH.	6 EA	\$ <u>3,420.00</u>
210-00810	Reset Ground Sign at the unit price of \$ <u>725.00</u> per EACH.	1 EA	\$ <u>725.00</u>
210-01000	Reset Fence at the unit price of \$ <u>405.00</u> per LINEAR FOOT.	14 LF	\$ <u>5670.00</u>
210-04010	Adjust Manhole at the unit price of \$ <u>1245.00</u> per EACH.	2 EA	\$ <u>2,490.00</u>
403-00721	Hot Mix Asphalt (Patching) (Asphalt) at the unit price of \$ <u>125.00</u> per TON.	218 Ton	\$ <u>27,250.00</u>
412-01220	Concrete Pavement (12 Inch) (Fast Track) at the unit price of \$ <u>100.00</u> per SQUARE YARD.	185 SY	\$ <u>18,500.00</u>
503-00036	Drilled Caisson (36 Inch) at the unit price of \$ <u>210.00</u> per LINEAR FOOT.	293 LF	\$ <u>61,530.00</u>
503-00048	Drilled Caisson (48 Inch) at the unit price of \$ <u>135.00</u> per LINEAR FOOT.	17 LF	\$ <u>2,295.00</u>
603-01240	24 Inch Reinforced Concrete Pipe at the unit price of \$ <u>180.00</u> per LINEAR FOOT.	5 LF	\$ <u>900.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
603-01480	48 Inch Reinforced Concrete Pipe at the unit price of \$ <u>270.00</u> per LINEAR FOOT.	7 LF	1,890.00 \$ _____
604-19110	Inlet Type R L 5 (10 Foot) at the unit price of \$ <u>6,000.00</u> per EACH.	1 EA	6,000.00 \$ _____
604-16505	Inlet Type 16 (Single) (5 Foot) at the unit price of \$ <u>5,250.00</u> per EACH.	1 EA	5,250.00 \$ _____
607-11525	Fence (Plastic) at the unit price of \$ <u>20.00</u> per LINEAR FOOT.	65 LF	1,300.00 \$ _____
608-00000	Concrete Sidewalk at the unit price of \$ <u>42.00</u> per SQUARE YARD.	338 SY	14,196.00 \$ _____
608-00010	Concrete Curb Ramp at the unit price of \$ <u>120.00</u> per SQUARE YARD.	267 SY	32,040.00 \$ _____
608-00015	Truncated Domes at the unit price of \$ <u>65.00</u> per SQUARE FOOT.	229 SF	14,885.00 \$ _____
609-21010	Curb and Gutter Type 2 (Section I-B) at the unit price of \$ <u>18.00</u> per LINEAR FOOT.	87 LF	1,566.00 \$ _____
609-21020	Curb and Gutter Type 2 (Section II-B) at the unit price of \$ <u>18.00</u> per LINEAR FOOT.	419 LF	7,542.00 \$ _____
609-24010	Gutter Type 2 (10 Foot) at the unit price of \$ <u>70.00</u> per LINEAR FOOT.	32 LF	2,240.00 \$ _____
610-00024	Median Cover Material (4 Inch Concrete) at the unit price of \$ <u>9.00</u> per SQUARE FOOT.	814 SF	7,326.00 \$ _____
612-00043	Delineator (Flexible) (Type III) at the unit price of \$ <u>92.00</u> per EACH.	4 EA	368.00 \$ _____
613-01200	2 Inch Electrical Conduit (Plastic) at the unit price of \$ <u>14.00</u> per LINEAR FOOT.	1,340 LF	18,760.00 \$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
613-01300	3 Inch Electrical Conduit (Plastic) at the unit price of \$ <u>17.00</u> per LINEAR FOOT.	3,250 LF	\$ <u>55,250.00</u>
613-060xx	Electric Meter Pedestal Cabinet and Base at the unit price of \$ <u>3,480.00</u> per EACH.	6 EA	\$ <u>20,880.00</u>
613-07000	Pull Box (Special) at the unit price of \$ <u>2,565.00</u> per EACH.	12 EA	\$ <u>30,780.00</u>
613-10000	Wiring at the unit price of \$ <u>42,000.00</u> per LUMP SUM.	1 LS	\$ <u>42,000.00</u>
614-00011	Sign Panel (Class I) at the unit price of \$ <u>30.00</u> per SQUARE FOOT.	590 SF	\$ <u>17,700.00</u>
614-00216	Steel Sign Post (2x2 Inch Tubing) at the unit price of \$ <u>52.00</u> per LINEAR FOOT.	114 LF	\$ <u>5,928.00</u>
614-01502	Steel Sign Support (2 Inch Round) (Post & Socket) at the unit price of \$ <u>30.00</u> per LINEAR FOOT.	60 LF	\$ <u>1,800.00</u>
614-10582	Steel Sign Support (2-1/2 Inch Round NP40) (Post and Slipbase) at the unit price of \$ <u>85.00</u> per LINEAR FOOT.	50 LF	\$ <u>4,250.00</u>
614-70150	Pedestrian Signal Face (16) (Countdown) at the unit price of \$ <u>610.00</u> per EACH.	44 EA	\$ <u>26,840.00</u>
614-70336	Traffic Signal Face (12-12-12) at the unit price of \$ <u>765.00</u> per EACH.	84 EA	\$ <u>64,260.00</u>
614-70560	Traffic Signal Face (12-12-12-12-12) at the unit price of \$ <u>1120.00</u> per EACH.	4 EA	\$ <u>4,480.00</u>
614-72860	Pedestrian Push Button at the unit price of \$ <u>375.00</u> per EACH.	21 EA	\$ <u>7,875.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
614-72866	Fire Preemption Unit and Timer at the unit price of \$ <u>14,500.00</u> per EACH.	6 EA	87,000.00 \$ _____
614-72886	Intersection Detection System (Camera) at the unit price of \$ <u>6,500.00</u> per EACH.	15 EA	97,500.00 \$ _____
614-72890	Span Wire Cable at the unit price of \$ <u>40.00</u> per LINEAR FOOT.	400 LF	16,000.00 \$ _____
614-75848	Traffic Signal Controller and Cabinet (Install Only) at the unit price of \$ <u>1,825.00</u> per EACH.	6 EA	\$ <u>10,950.00</u>
614-81000	Traffic Signal-Light Pole Steel at the unit price of \$ <u>5,400.00</u> per EACH.	3 EA	16,200.00 \$ _____
614-81010	Traffic Signal-Light Pole Steel (1 Mast Arm) at the unit price of \$ <u>21,000.00</u> per EACH.	14 EA	\$ <u>294,000.00</u>
614-81020	Traffic Signal-Light Pole Steel (2 Mast Arm) at the unit price of \$ <u>22,750.00</u> per EACH.	2 EA	\$ <u>45,500.00</u>
614-85366	Traffic Signal-Light Span Wire Pole (16 Inch) at the unit price of \$ <u>7,250.00</u> per EACH.	4 EA	\$ <u>29,000.00</u>
614-86105	Telemetry (Field) at the unit price of \$ <u>3,950.00</u> per EACH.	6 EA	23,700.00 \$ _____
614-87320	Closed Circuit Television at the unit price of \$ <u>4,345.00</u> per EACH.	6 EA	26,070.00 \$ _____
625-00000	Construction Surveying at the unit price of \$ <u>6,250.00</u> per LUMP SUM.	1 LS	6,250.00 \$ _____
626-00000	Mobilization at the unit price of \$ <u>31,715.25</u> per LUMP SUM.	1 LS	31,715.25 \$ _____

Item No.	Description and Price	Estimated Quantity	Estimated Cost
627-00005	Epoxy Pavement Marking at the unit price of \$ <u>395.00</u> per GALLON.	7 GAL	\$ <u>2,765.00</u>
627-01001	Preformed Plastic Pavement Marking (Type I) at the unit price of \$ <u>15.00</u> per SQUARE FOOT.	300 SF	\$ <u>4,500.00</u>
627-30332	Preformed Thermoplastic Pavement Marking (Xwalk-Stopline) at the unit price of \$ <u>11.50</u> per SQUARE FOOT.	3,940 SF	\$ <u>45,310.00</u>
630-00000	Flagging at the unit price of \$ <u>20.00</u> per HOUR.	800 HR	\$ <u>16,000.00</u>
630-00003	Uniformed Traffic Control at the unit price of \$ <u>74.00</u> per HOUR.	80 HR	\$ <u>5,920.00</u>
630-00012	Traffic Control Management at the unit price of \$ <u>400.00</u> per DAY.	120 Day	\$ <u>48,000.00</u>
630-80336	Barricade Type 3M-B (Temporary) at the unit price of \$ <u>26.00</u> per EACH.	2 EA	\$ <u>52.00</u>
630-80341	Construction Traffic Sign (Panel Size A) at the unit price of \$ <u>21.00</u> per EACH.	26 EA	\$ <u>546.00</u>
630-80342	Construction Traffic Sign (Panel Size B) at the unit price of \$ <u>31.00</u> per EACH.	19 EA	\$ <u>589.00</u>
630-80357	Advance Warning Flashing or Sequencing Arrow Panel (B Type) at the unit price of \$ <u>525.00</u> per EACH.	2 EA	\$ <u>1,050.00</u>
630-80360	Drum Channelizing Device at the unit price of \$ <u>21.00</u> per EACH.	30 EA	\$ <u>630.00</u>
630-80363	Drum Channelizing Device (With Light) (Flashing) at the unit price of \$ <u>26.00</u> per EACH.	10 EA	\$ <u>260.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
630-80380	Traffic Cone at the unit price of \$ <u>10.00</u> per EACH.	150 EA	1,500.00 \$ _____
630-80384	Tubular Marker at the unit price of \$ <u>6.00</u> per EACH.	50 EA	300.00 \$ _____
	Construction Engineering, Materials Testing and Permitting at the unit price of \$ <u>3,500.00</u> per LUMP SUM.	1 LS	\$ <u>3,500.00</u>
	TOTAL BASE BID:		\$ <u>1,447,744.00</u>

Item No.	Description and Price	Estimated Quantity	Estimated Cost
700-70023	On-the-Job Trainee at the unit price of <u>\$640.00</u> per .	1 FA	\$ <u>640.00</u>
700-70082	Furnish and Install Electrical Service at the unit price of <u>\$15,000.00</u> per .	1 FA	\$ <u>15,000.00</u>
700-70110	Install Electrical Conduits at the unit price of <u>\$12,000.00</u> per .	1 FA	\$ <u>12,000.00</u>
700-70130	Repair Concrete Sidewalk (Concrete Restoration) at the unit price of <u>\$6,500.00</u> per .	1 FA	\$ <u>3,500.00</u> 6,500.00
700-70200	Pothole Utilities at the unit price of <u>\$6,500.00</u> per .	1 FA	\$ <u>3,500.00</u> 6,500.00
700-70310	Landscaping at the unit price of <u>\$15,000.00</u> per .	1 FA	\$ <u>15,000.00</u>
700-70380	Erosion Control at the unit price of <u>\$5,000.00</u> per .	1 FA	\$ <u>5,000.00</u>
700-70589	Environmental Health and Safety Management at the unit price of <u>\$5,000.00</u> per .	1 FA	\$ <u>5,000.00</u>
700-70592	Survey Monumentation at the unit price of <u>\$1,000.00</u> per .	1 FA	\$ <u>1,000.00</u>
TOTAL FORCED ACCOUNTS			\$ <u>60,640.00</u> (this total is actually \$66,640.00)
TOTAL BASE BID AND FORCED ACCOUNTS			\$ <u>1,508,384.00</u> 1,514,384.00

ga

Total Bid Amount of:

~~One Million Four Hundred Forty Seven Thousand Seven Hundred Forty Four and no cents~~

One Million Five Hundred Eight Thousand Three Hundred Eighty Four Dollars & No Cents
Dollars (\$ ~~1,447,744.00~~ \$1,508,384.00)

[Total bid amount equals the sum of each estimated cost for item numbers 202-00019 630-80384 (Eighty Seven [87] total bid items)]

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 in the sum of the full amount of this bid, executed by a surety company acceptable to the Manager.

The Sturgeon Electric Company, Inc., a corporation of the State of Michigan, is hereby offered as Surety on said bond. If such surety is not approved by the Manager, another and satisfactory surety company shall be furnished.

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

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

Name: Jeff Waneka Name: _____
Jeff Waneka, Vice President
Address: _____ Address: _____

If there are no such persons, firms, or corporations, please so state in the following space: None

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
Concrete	8.12	Chato's Concrete, 7620 Elmwood Lane, Denver, CO 80221
Excavating	1.15	Blanco Inc., 796 Poppy Dr, Brighton, CO 80601
Hydro Excavating	.36	Badger Daylighting, 9700 E. 104th Ave, Henderson, CO 80640
Potholing	5.12	Frontier Underground, 16250 Del Ray Ct., Brighton, CO 80603
Pavement Markings	3.73	Kolbe Striping, 550 Topeka Blvd, Castle Rock, CO 80109
Surveying	.41	PWSI Land, Inc. 3545 S. Platte River Dr, Ste M-3, Sheridan, CO
Traffic Control	4.10	Innovative Traffic Control, 4301 S. Federal #116, Sheridan, CO

(Copy this page if additional room is required.)

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



DENVER
THE GOLDEN CITY

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

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

City and County of Denver Contract No.: 201207522

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

Address: 12150 E. 112th Ave., Henderson, CO 80640 Contact Person: Reuben LaGuardia

Type of Service: Electrical Dollar Amount: \$ Percent of Project:

MWBE or DBE Prime Bidder

Business Name:

Address: Contact Person:

Type of Service: Dollar Amount: \$ Percent of Project:

Subcontractors, Suppliers Manufacturers or Brokers (check one box)

Subcontractor (v) Supplier (v) Manufacturer (v) Broker (v)

Business Name: American Industrial & Construction Supply, Inc.

Address: 975 E. 58th Ave. Unit C., Denver Type of Service: Supplier

Contact Person: Veronica LaDeaux Dollar Amount: \$172,313.85 Percent of Project 11.9%

Subcontractor (v) Supplier (v) Manufacturer (v) Broker (v)

Business Name: Chato's Concrete, LLC

Address: P.O. Box 21008, Denver, CO 80221 Type of Service: Concrete

Contact Person: Eleazar Villalobos Dollar Amount: \$117,574.00 Percent of Project 8.12%

Subcontractor (v) Supplier (v) Manufacturer (v) Broker (v)

Business Name: Blanco, Inc.

Address: 796 Poppy Dr., Brighton, CO 80601 Type of Service: Pipeline Const.

Contact Person: Rogelio Alvarado Dollar Amount: \$16,600.00 Percent of Project 1.15%

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 (√)
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 (√)

COMP-FRM-011

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 DBE(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 DBE "Letter of Intent" in five working days (5), on each of its DBE or DBE 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 words and figures and all statements made in these Bid Forms.

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

Business Address of Bidder: 12150 E. 112th Avenue

City, State, Zip Code: Henderson, CO 80640

Telephone Number of Bidder: 303-286-8000 Fax No. 303-286-1911

Contact Name for this Project: Reuben LaGuardia

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:
Denver Union Station Project Authority

For information relative thereto, please refer to:

Name: Tim Uribe, 303-710-6042

Title: Project Manager

Address: Denver Union Station Project Authority

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

Addenda Number 1 Date 9/19/12

Addenda Number _____ Date _____

Addenda Number _____ Date _____

Dated this 21st day of September, 2012

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

**CONTRACT NO. 201207522
PROJECT NAME: SHE 2011 PKG 2 TRAFFIC SIGNAL UPGRADE**

ADDENDUM NO. 1 TO CONTRACT DOCUMENTS

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

BID FORM PACKAGE

Bid Item 250-00010 Environmental Health and Safety Management has been deleted.
Please use the attached BF-6.2 dated September 20, 2012

BID DOCUMENT PACKAGE

POSTPONDMENT

Sealed Bids for Contract No.201207522 SHE 2011 PKG 2 TRAFFIC SIGNAL UPGRADE is hereby postponed from September 21, 2012 to September 26, 2012 in conference room 4.I.3. . Sealed bids will be received at the Permit Counter on the 2nd floor at 201 West Colfax, Denver, CO 80202 no later than 11:00 AM.

Statement of Quantities delete page SQ-1 and replace with the attached SQ-1 dated September 20, 2012.

QUESTIONS & ANSWERS

Bid Item 250-00010 Environmental Health and Safety Management – Could we get a clarification on this item. What are the differences between this item and the FA Bid Item? What will the contractor be paid for under contract, versus what would be paid for under the Force Account?

1. The Environmental Health and Safety management bid item is an error. Only the concrete wash out structures and clean culvert will be measured and paid in accordance with Section 208. All other Erosion Control items (including Erosion Control Supervisor) will not be measured and paid for separately, but shall be included in the project Force Account for Erosion Control and Environmental Health and Safety Management. All tasks to be performed by the Erosion Control Supervisor shall be per the 208 spec as shown in the PSP. Pay item number 250-00010 – Environmental Health and Safety Management – will be removed from the bid items on this project (SHE 2011 package 2 – Contract number 201207522).

Last Bid item: Construction Engineering, Materials, Testing and Permitting. Can you please define the scope of this pay item? For instance: What type of engineering, which materials will need testing and what tests will be required? What Permits are required?

2. The following are the required construction materials testing services for this project and are based upon the project plans and the City of Denver's requirements.
 - Field density-compaction testing and laboratory evaluation of soils for storm sewer installation, site grading and subgrade preparation for streets, sidewalks, and curb and gutter;
 - Field testing and laboratory evaluation of concrete used for storm sewer inlets, pavement, curb and gutter, sidewalks, and median construction; and
 - Field-testing and laboratory evaluation of asphalt concrete materials used during pavement construction.Detailed scope of services is as follows:
 - Field Density-Compaction Testing: Field density-compaction testing will be performed as needed by an Engineering Technician during storm sewer trench backfill, site grading and subgrade preparation for sidewalks, curb and gutter, and pavement.
 - The field services will be supported by appropriate laboratory evaluation of soils used as fill or backfill on the site. The laboratory testing may include laboratory moisture-density relationship (Proctor), sieve analysis and Atterberg limit determinations.
 - Concrete Testing: An Engineering Technician will be provided, on an as need basis, to sample the plastic concrete used during the construction of storm sewer inlets, pavement, curb and gutter, median and sidewalk construction. The concrete will be tested for slump, air content and temperature at the time of placement. Sets of five, 4-inch by 8-inch cylinders will be molded at each sampling. The samples will be returned to tester's laboratory for moist curing and compressive strength testing.

- Asphalt Concrete Paving: Field density-compaction testing by nuclear methods will be performed an Engineering Technician, on an as need basis, during the placement of asphalt concrete at the project.
- The asphalt concrete will be sampled and submitted to the tester's laboratory for Rice value and asphalt content determination, and perform gradation analysis for determination of aggregate compliance with project requirements.

Since all material sampling will be during the construction of the roadway, the testing can be under the prime contractor's Street Occupancy Permit and no additional permits will be required.

Page Reference PSP-45 Section 603 – Will the pipe need to be encased?

3. If a new storm sewer crosses the sanitary sewer line and the separation is less than 18 inches, then the sanitary sewer line will need to be encased. Because the existing sanitary sewer lines located on Alameda Avenue at Clay Street runs parallel to the new storm sewer extension, encasing these sanitary sewer lines are not required. Likewise, the storm sewer extension at US 285 and Sheridan is also parallel to the existing sanitary sewer line, and encasing this sanitary sewer line is not required.

Page Reference – Plan Sheet No. 44 – Note No. 10 – What type testing, if any will be required to satisfy this note?

4. No defined testing will be required, however the contractor must ensure that the interconnect system is working and communication between the traffic signal controller and the Central System (located in the Denver TMC) is established. Therefore, it is the contractor's responsibility to reestablish communication and call the Denver TMC after the reconnection to verify that the connection and communication is reestablished.

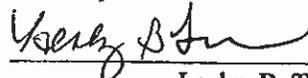
Page Reference Plan Sheet No. 44 – Note No. 15 – Typically we have installed the 2 channel cards. Can you clarify what the City will require?

5. To operate the fire preemption unit, Denver will require four channels. Therefore, Denver will accept either one 4-channel card or two 2-channel cards per intersection.

Bid Item 202-01000 Removal of Fence – Bid Item 210-01000 Reset Fence. The quantities of removal and reset are different. Do we need to provide a new fence for the Reset Fence bid item?

6. The removal and reset quantity is an approximate value and the actual quantities will be paid at the bid unit price. The existing fence is to be reset, but additional posts and brackets may be required.

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



 Lesley B. Thomas
 City Engineer

9.20.12

 Date

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

 Sturgeon Electric Company, Inc.
 Contractor

ADDENDUM NO. 1

DATE: 20 Sept 2012

Item No.	Description and Price	Estimated Quantity	Estimated Cost
202-01000	Removal of Fence at the unit price of \$ _____ per LINEAR FOOT.	13 LF	\$ _____
202-04003	Clean Culvert (Special) at the unit price of \$ _____ per EACH.	12 EA	\$ _____
203-01597	Potholing at the unit price of \$ _____ per EACH.	120 EA	\$ _____
208-00045	Concrete Washout Structure at the unit price of \$ _____ per EACH.	6 EA	\$ _____
210-00810	Reset Ground Sign at the unit price of \$ _____ per EACH.	1 EA	\$ _____
210-01000	Reset Fence at the unit price of \$ _____ per LINEAR FOOT.	14 LF	\$ _____
210-04010	Adjust Manhole at the unit price of \$ _____ per EACH.	2 EA	\$ _____
403-00721	Hot Mix Asphalt (Patching) (Asphalt) at the unit price of \$ _____ per TON.	218 Ton	\$ _____
412-01220	Concrete Pavement (12 Inch) (Fast Track) at the unit price of \$ _____ per SQUARE YARD.	185 SY	\$ _____
503-00036	Drilled Caisson (36 Inch) at the unit price of \$ _____ per LINEAR FOOT.	293 LF	\$ _____
503-00048	Drilled Caisson (48 Inch) at the unit price of \$ _____ per LINEAR FOOT.	17 LF	\$ _____
603-01240	24 Inch Reinforced Concrete Pipe at the unit price of \$ _____ per LINEAR FOOT.	5 LF	\$ _____



CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
Engineering Division

CONTRACT NO. 201207522
SHE 2011 PKG 2 TRAFFIC SIGNAL UPGRADE

STATEMENT OF QUANTITIES

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>
202-00019	Removal of Inlet	2 EA
202-00035	Removal of Pipe	7 LF
202-0008x	Removal of Bollard	1 EA
202-00190	Removal of Concrete Median Cover Material	148 SY
202-00200	Removal of Sidewalk	326 SY
202-00201	Removal of Curb	13 LF
202-00202	Removal of Gutter	31 LF
202-00203	Removal of Curb and Gutter	728 LF
202-00206	Removal of Concrete Curb Ramp	145 SY
202-00210	Removal of Concrete Pavement	80 SY
202-00220	Removal of Asphalt Mat	410 SY
202-00810	Removal of Ground Sign	12 EA
202-00828	Removal of Traffic Signal Equipment	1 LS
202-01000	Removal of Fence	13 LF
202-04003	Clean Culvert (Special)	12 EA
203-01597	Potholing	120 EA
208-00045	Concrete Washout Structure	6 EA
210-00810	Reset Ground Sign	1 EA
210-01000	Reset Fence	14 LF
210-04010	Adjust Manhole	2 EA
403-00721	Hot Mix Asphalt (Patching) (Asphalt)	218 Ton
412-01220	Concrete Pavement (12 Inch) (Fast Track)	185 SY
503-00036	Drilled Caisson (36 Inch)	293 LF
503-00048	Drilled Caisson (48 Inch)	17 LF
603-01240	24 Inch Reinforced Concrete Pipe	5 LF
603-01480	48 Inch Reinforced Concrete Pipe	7 LF
604-19110	Inlet Type R L 5 (10 Foot)	1 EA
604-16505	Inlet Type 16 (Single) (5 Foot)	1 EA
607-11525	Fence (Plastic)	65 LF
608-00000	Concrete Sidewalk	338 SY

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:  _____, its ~~President~~
Jeffrey Waneka, Vice President

Attest:

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: _____
Title: _____ Secretary (Corporate Seal)

Firm: _____

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

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

Firm: _____

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

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

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



DENVER
THE MILE HIGH CITY

**COMMITMENT TO DBE
PARTICIPATION**

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

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

The Bidder/Proposer is committed to a minimum of 15 % **DBE** utilization on the project, and will submit Letters of Intent (LOI) for each subcontractor/subconsultant listed in the Bid Forms as follows:
Hard Bids: Five (5) business days after the bid opening
Request for Proposals: With the proposal when due

The Bidder/Proposer is unable to meet the project goal of _____% **DBE**, but is committed to a minimum of _____% **DBE** utilization on the project. The Bidder/Proposer understands that they must submit a detailed statement of their **good faith** effort in accordance with DRMC Section 28-62 and 28-67 of Ordinance 760 and must submit Letters of Intent for each **DBE** listed in the Bid Forms, within five (5) business days after the bid opening or at time proposal is submitted.

The Bidder/Proposer is a certified **DBE** 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): Jeffrey Waneka

Signature (Firm's Representative):

Title: Vice President

Address: 12150 E. 112th Avenue

City: Henderson

State: CO

Zip: 80640

Phone: 303-286-8000

Fax: 303-286-1811

Email: jwaneka@myrgr.com

A copy of the DBE Certification must be attached.

Chato's Concrete, LLC Certification #8399

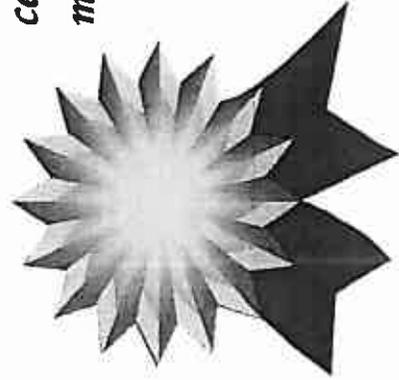
Is hereby certified as a Disadvantaged Business Enterprise pursuant to U.S. Department of Transportation DBE regulations found at 49 CFR, Parts 23 and 26 and administered by Colorado's UCP.

Work Codes

- Denver-10204: Concrete Flatwork and Curb and Gutter (Remove and Install)
- Denver-205: Concrete Flatwork, Denver-22802: Asphalt Curb
- Denver-23904: Concrete Flatwork/Pavement
 - Denver-25502: Tractor Trailer
- Denver-25503: Special Trailers (Live Bottom, Belly Dump, End Dump)
- Denver-25505: Dirt (Haul), Denver-25506: Aggregate (Haul)
- Denver-25507: Asphalt (Haul), Denver-25508: Rip Rap (Haul)
 - Denver-25509: Construction Debris

Certification Date: DBE February 18, 2010 – February 17, 2013

This certification expires on the 17th day of February 2013. A new certificate will be issued every 3rd year, upon successfully meeting annual renewal requirements.





Tameela Lee, Director

UCP Partner at City and County of Denver

02/18/10

Date

AMERICAN INDUSTRIAL & CONSTRUCTION SUPPLY, INC.

Certification #7145

Is hereby certified as a Disadvantaged Business Enterprise pursuant to U.S. Department of Transportation DBE regulations found at 49 CFR, Parts 23 and 26 and administered by Colorado's UCP.

Work Codes

60903	Concrete
60908	Sand
61500	Electrical Products, Supplies and Components
62000	Fasteners
63200	Industrial Supplies and Equipment
66100	Roofing
67200	Tools

Certification Date: September 24, 2009 - September 23, 2012

This certification expires on the aforementioned date. A new certificate will be issued ending every 3rd year, upon successfully meeting annual renewal requirements.

October 1, 2009

Date

Tamela Lee, Director

UCP Partner at City and County of Denver

Vendor Information



Vendor Information

Business Name	Blanco, Inc
Owner	Juan Blanco
Address	796 Poppy Dr Brighton, CO 80601
> Map This Address	
Phone	303-659-6508
Fax	303-498-0221
Email	juanblancoinc@yahoo.com

Certification Information

Certifying Agency	City and County of Denver
Certification Type	DBE - Disadvantaged Business Enterprise
Certified Business Description	Excavating/Earthwork and Pipeline Construction

Work Codes

CO UCP NAICS 237110	Sewer main, pipe and connection, construction
CO UCP NAICS 237310	Culverts, highway, road and street, construction
CO UCP NAICS 238910	Excavation contractors

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DENVER
THE MILE HIGH CITY

Office of Economic Development
Division of Small Business Opportunity
Compliance Unit
201 West Colfax Ave., Dept. 907
Denver, CO 80202
Phone: 720-913-1929 Fax: 720-913-1803

LETTER OF INTENT (LOI)

INSTRUCTIONS FOR COMPLETION & SUBMISSION:

- All lines must be completed or marked *N/A* for Not Applicable
- Submit the attached completed checklist with this letter
 - Email to gsbc@denvergov.org, **OR**
 - Fax: 720-913-1803, **OR**
 - Hand-Delivery: Office Economic Dev. 1st Fl., "Business Assistance Center (BAC)"
- FOR RFPs: LOIs should be submitted with Proposal.

Contract No.:		Project Name:					
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 or DBE							
Name of Bidder/Consultant:				Self-Performing: <input type="checkbox"/> Yes <input type="checkbox"/> No		Phone:	
Contact Person:			Email:			Fax:	
Address:			City:			State:	Zip:
B. The Following Section is To Be Completed by the M/WBE, SBE or DBE, at any Tier This Letter of Intent Must be Signed by the M/WBE, SBE or DBE and Bidder/Consultant							
Name of Certified Firm:						Phone:	
Contact Person:			Email:			Fax:	
Address:			City:			State:	Zip:
Please check the designation which applies to the certified firm.				<input type="checkbox"/> M/WBE (-)	<input type="checkbox"/> SBE (-)	<input type="checkbox"/> DBE (-)	<input type="checkbox"/> Self-Performing (-)
Indirect Utilization: If this M/WBE, SBE 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 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/DBEs scope of work or supply corresponds to.</u>							
<input type="checkbox"/> Subcontractor/Subconsultant (✓)		<input type="checkbox"/> Supplier (✓)			<input type="checkbox"/> Broker (✓)		
Bidder intends to utilize the aforementioned M/WBE, SBE or DBE for the Work/Supply described above. The cost of the work and percentage of the total subcontractor M/WBE, SBE or DBE bid amount is:							
\$ _____						%	
Consultant intends to utilize the aforementioned M/WBE, SBE or DBE for the Work/Supply described above. The percentage of the work of the total subconsultant M/WBE, SBE or DBE will perform is: _____ %							
If the fee amount of the work to be performed is requested, the fee amount, is:						\$ _____	
Bidder/Consultant's Signature:						Date:	
Title:							
M/WBE, SBE or DBE or Self-Performing Firm's Signature:						Date:	
Title:							
If the above named Bidder/Consultant is not determined to be the successful Bidder/Consultant, this Letter of Intent shall be null and void.							

Letter of Intent (LOI) Checklist

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

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

Select One ✓	SUBMITTED VIA... (Bidder/Consultant is strongly urged to deliver the LOI via one of the methods below. Delivery to any other point cannot be guaranteed timely delivery.)
<input type="checkbox"/>	Email to DSBO@denvergov.org
<input type="checkbox"/>	Fax to 720-913-1803
<input type="checkbox"/>	Hand Delivery to Office of Economic Development, 1 st Floor, "Business Assistance Center"

The complete and accurate information that is required for the Letter of Intent is based on the following sections of the Ordinance: 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.

COMP-FRM-012 Revised 04-12-13



DENVER
THE MILE HIGH CITY

JOINT VENTURE AFFIDAVIT

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

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

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

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

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

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

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

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



JOINT VENTURE ELIGIBILITY FORM

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

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, 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/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/M/W or DBE)	

Type of Work for which Certification was granted:

General Information

SBE/MBE/WBE/DBE Initial Capital Contributions: \$	%
Future capital contributions (explain requirements) (attach additional sheets if necessary):	
Source of Funds for the SBE/MBE/WBE/DBE Capital Contributions:	
Describe the portion of the work or elements of the business controlled by the SBE/MBE/WBE or DBE: (attach additional sheets if necessary)	
Describe the portion of the work or elements of the business controlled by non-SBE/MBE/WBE or DBE: (attach additional sheets if necessary)	

JOINT VENTURE ELIGIBILITY FORM

General Information

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

Describe the SBE/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/MBE/WBE or DBE joint venture participant:

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

b. Non- SBE/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 SMWBE, non-SMWBE or joint venture:

	Non- SBE/MBE/WBE/DBE	SBE/MBE/WBE/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
(V)

No
(V)

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.

CCMP-FRM-015

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

THAT _____, as Principal, and _____, a corporation organized and existing under and by virtue of the laws of the State of _____, and authorized to do business within the State of Colorado, as Surety, are held and firmly bound unto the City and County of Denver, Colorado, as Obligee, in full and just sum of _____ Dollars, (\$ _____), 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 _____, 20____, for the construction of: **Contract No. 201207522, SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE**, as set forth in detail in the Contract Documents for the City and County of Denver, Colorado, and said Obligee has required as a condition for receiving said bid that the Principal deposit specified bid security in the amount of not less than five percent (5%) of the amount of said bid, as it relates to work to be performed for the City, conditioned that in event of failure of the Principal to execute the Contract, for such construction and furnish required Performance and Payment Bond if the contract is offered him that said sum be paid immediately to the Obligee as liquidated damages, and not as a penalty, for the Principal's failure to perform.

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

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

ATTEST

Secretary

Principal

By _____

Title

Surety

By _____

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

[SEAL]

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

BIDDER/CONTRACTOR/VENDOR/PROPOSER DISCLOSURE FORM

Bidding Entity's/Proposer's Name

Date this form was completed

Address

() _____
Telephone Number

City, State, Zip Code

Name of Officer/Owner completing this Form

INSTRUCTIONS

1. Section 20-69 of the Denver Revised Municipal Code provides that the public interest is best served by maximum disclosure of political contributions made to candidates seeking election to City office by persons transacting business with the City and County of Denver. This Disclosure Form was devised to insure that City Bidder/Contractor/Vendor/Proposers comply with all applicable requirements of Section 20-69, D.R.M.C.

2. Complete each applicable Section of this Form in accordance with the following instructions and return it to the appropriate City official as directed.

3. If your business entity has previously submitted a Form **and** the information provided in this previously submitted Form **has not changed**, you need only complete Section 6 and return the Form.

4. If your business entity has not previously submitted a Form or any of the information contained in a previously submitted Form **has changed**, you must identify in Section 1 the **name of each** of the following for your business entity: (a) any director, (b) any officer, (c) any principal, (d) any owner and (e) any shareholder who owns or controls 5% or more of your entity.

5. If you are required to complete Section 1, you must also **EITHER**:

(A) Identify in Section 2, for each person listed in Section 1, that person's spouse, if any, and any children of that person, under the age of eighteen (18);

OR

(B) Identify in Section 3, any person listed in Section 1 and any spouse or age eighteen (18) or under child of any person listed in Section 1 that made a CONTRIBUTION, as defined in D.R.M.C. 15-32, to any CANDIDATE, as also defined in D.R.M.C. 15-32, during the last five (5) years,

AND

Certify in Section 4 that, except as disclosed in Section 3, no other person listed in Section 1 or any spouse or child under the age of eighteen (18) of any person listed in Section 1 made a contribution to any candidate, as these terms are defined in D.R.M.C. 15-32, during the last five (5) years.

6. And finally, if your bid/contract/purchase order/proposal includes subcontractors, subconsultants or suppliers receiving **more than \$100,000.00** for any work performed, materials provided or services rendered or your business entity has a collective bargaining agreement with any union, you must identify each such subcontractor/subconsultant/supplier and each such union in Section 5.

SECTION 1. MUST BE FILLED OUT BY ALL BIDDER/PROPOSERS/CONTRACTORS/VENDORS:

Identify below each individual having the noted relationship with the business entity listed above. Show appropriate letter in the box to the left. A = Officer, B= Director, C = Principal, D = Owner, E= Controller of 5% or more of the stock. If more than one category applies, show in second box.

1. [] [] _____	9. [] [] _____
2. [] [] _____	10. [] [] _____
3. [] [] _____	11. [] [] _____
4. [] [] _____	12. [] [] _____
5. [] [] _____	13. [] [] _____
6. [] [] _____	14. [] [] _____
7. [] [] _____	15. [] [] _____
8. [] [] _____	16. [] [] _____

EITHER FILL OUT SECTION 2 OR SECTION 3 AND SECTION 4 IF APPLICABLE.

SECTION 2. Identify below each individual that is the spouse or a child under the age of eighteen (18) of any individual listed in Section 1 above. Use the first box to designate relationship as follows; F = Spouse, G = Child under 18. Use the second box to identify relationship to person listed in Section 1 above. For example, if on Line 3 of Section 1 the name of John Doe is listed and his spouse, Jane Doe is listed on line 7 of Section 2, the number 3 should be placed in the second box of line 7 of Section 2.

1. [] [] _____	9. [] [] _____
2. [] [] _____	10. [] [] _____
3. [] [] _____	11. [] [] _____
4. [] [] _____	12. [] [] _____
5. [] [] _____	13. [] [] _____
6. [] [] _____	14. [] [] _____
7. [] [] _____	15. [] [] _____
8. [] [] _____	16. [] [] _____

SECTION 3. DISCLOSURE OF CONTRIBUTION BY PERSONS LISTED IN SECTION 1 AND DISCLOSURE OF ANY SPOUSE OR CHILD UNDER THE AGE OF EIGHTEEN (18) OF A PERSON LISTED IN SECTION 1 WHO HAS MADE A CONTRIBUTION:

List the names of any person listed in Section 1 who has made a contribution and the name of any spouse or child under the age of eighteen (18) of any person listed in Section 1 who has made a contribution during the last five (5) years. Use the first box to identify the person: A = Officer, B = Director, C = Principal, D = Owner, E = Controller of 5% or more of the stock, F = Spouse, G= Child under 18, use the second box to identify relationship of spouse or child listed to person listed in Section 1.

1. [] [] _____	9. [] [] _____
2. [] [] _____	10. [] [] _____
3. [] [] _____	11. [] [] _____
4. [] [] _____	12. [] [] _____
5. [] [] _____	13. [] [] _____
6. [] [] _____	14. [] [] _____
7. [] [] _____	15. [] [] _____
8. [] [] _____	16. [] [] _____

SECTION 4. BIDDER/CONTRACTOR/VENDOR/PROPOSER CERTIFIED STATEMENT IN LIEU OF DISCLOSURE. I hereby certify that, except as listed above, no officer, director, shareholder who owns or controls 5% or more of the business entity, principal, owner or his or her spouse or child under eighteen years of age has made a contribution, as defined in Section 15-32 D.R.M.C., or a contribution in kind, as defined at Section 15-32 D.R.M.C., to a candidate, as defined at Section 15-32 D.R.M.C., during the last five years.

Authorized Signature of Officer/Owner of Business entity

SECTION 5. DISCLOSURE OF SUBCONTRACTORS, SUPPLIERS AND UNIONS. List the names of any unions with which your entity has a collective bargaining agreement and the names of any subcontractors or suppliers whose share of the amount to be paid by the City for this contract, purchase order or proposal will exceed One Hundred Thousand Dollars (\$100,000.00), identifying them in the box provided as follows: H = Subcontractor, I = Supplier, J = Union.

- | | |
|------------------|-------------------|
| 1. [] [] _____ | 9. [] [] _____ |
| 2. [] [] _____ | 10. [] [] _____ |
| 3. [] [] _____ | 11. [] [] _____ |
| 4. [] [] _____ | 12. [] [] _____ |
| 5. [] [] _____ | 13. [] [] _____ |
| 6. [] [] _____ | 14. [] [] _____ |
| 7. [] [] _____ | 15. [] [] _____ |
| 8. [] [] _____ | 16. [] [] _____ |

SECTION 6. CERTIFIED STATEMENT OF PREVIOUS DISCLOSURE.

I hereby certify that the information required to be disclosed by Section 20-69(d) D.R.M.C. [i.e. the information contained in responses to Sections 1, 2, 3, 4, 5 and 6 of this Form] for _____ has previously been furnished
Name of Entity
to the City and County of Denver and is on file with the City Clerk and further certify that such information is current as of the date indicated below.

Authorized Signature of Officer/Owner of
Business Entity

Date

COLORADO DEPARTMENT OF TRANSPORTATION - Form 605
**CONTRACTORS PERFORMANCE CAPABILITY
STATEMENT**

Project #

SHE R600-391

1. List names of partnerships or joint ventures none

List decreases in the contractors fiscal or workmanship qualifications compared to the last prequalification statement submitted to CDOT. (Attach additional sheets if necessary)

a. Key personnel changes none

b. Key equipment changes none

c. Fiscal capability changes (legal actions, etc.) none

d. Other changes that may affect the contractors ability to perform work none

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE

Contractor's firm or company name

Sturgeon Electric Company, Inc.

By

Title



Jeffrey Waneka, Vice President

Date 21 September 2012

2nd Contractor's firm or company name (if joint venture)

By

Title

Date

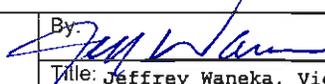
COLORADO DEPARTMENT OF TRANSPORTATION ANTI-COLLUSION AFFIDAVIT	Project No.: SHE R600-391
	Location: Denver

I hereby attest that I am the person responsible within my firm for the final decision as to the price(s) and amount of this bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on behalf of my firm.

I further attest that:

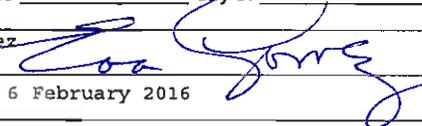
1. The price(s) and amount of this bid have been arrived at independently, without consultation, communication or agreement for the purpose or with the effect of restricting competition with any other firm or person who is a bidder or potential prime bidder.
- 2A. Neither the price(s) nor the amount of this bid have been disclosed to any other firm or person who is a bidder or potential prime bidder on this project, and will not be so disclosed prior to bid opening.
- 2B. Neither the prices nor the amount of the bid of any other firm or person who is a bidder or potential prime bidder on this project have been disclosed to me or my firm.
- 3A. No attempt has been made to solicit, cause or induce any firm or person who is a bidder or potential prime bidder to refrain from bidding on this project, or to submit a bid higher than the bid of this firm, or any intentionally high or non-competitive bid or other form of complementary bid.
- 3B. No agreement has been promised or solicited for any other firm or person who is a bidder or potential prime bidder on this project to submit an intentionally high, noncompetitive or other form of complementary bid on this project.
4. The bid of my firm is made in good faith and not pursuant to any consultation, communication, agreement or discussion with, or inducement or solicitation by or from any firm or person to submit any intentionally high, noncompetitive or other form of complimentary bid.
5. My firm has not offered or entered into a subcontract or agreement regarding the purchase or sale of materials or services from any firm or person, or offered, promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from bidding or to submit any intentionally high, noncompetitive or other form of complementary bid or agreeing or promising to do so on this project.
6. My firm has not accepted or been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value by any firm or person whether in connection with this or any other project, in consideration for my firm's submitting any intentionally high, noncompetitive or other form of complementary bid, or agreeing or promising to do so, on this project.
7. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval or submission of my firm's bid on this project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, or other conduct inconsistent with any of the statements and representations made in this affidavit.
8. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as a fraudulent concealment from the Colorado Department of Transportation, of the true facts relating to the submission of bids for this contract.

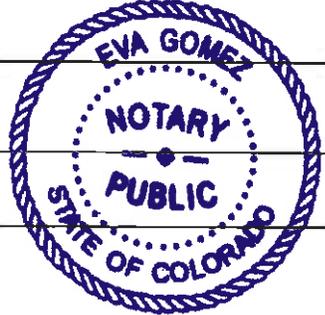
I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Contractors firm or company name: Sturgeon Electric Company, Inc.	By: 	Date: 9/21/12
	Title: Jeffrey Waneka, Vice President	

2 nd Contractors firm or company name:	By:	Date:
	Title:	

Sworn to before me this 21st day of September 2012

Notary Public Eva Gomez 
My commission expires: 6 February 2016



NOTE: THIS DOCUMENT MUST BE SIGNED IN INK.

COLORADO DEPARTMENT OF TRANSPORTATION
ASSIGNMENT OF ANTITRUST CLAIMS

Project No.:
 SHE R600-391

Contractor and Colorado Department of Transportation (CDOT) recognize that in actual economic practice antitrust violations ultimately impact CDOT. Therefore, for good cause and as consideration for executing this contract and for receiving payments hereunder:

1. Contractor hereby irrevocably assigns to CDOT any and all claims it may now have or which may hereafter accrues to it under federal or state antitrust laws in connection with the particular project, goods or services purchased or acquired by CDOT pursuant to this contract.
2. Contractor hereby expressly agrees:
 - a. That, upon becoming aware that a third party has commenced a civil action asserting on Contractor's behalf an antitrust claim which has been assigned to CDOT hereunder, Contractor shall immediately advise in writing:
 - (1) Such third party that the antitrust claim has been assigned to CDOT, and
 - (2) CDOT that such civil action is pending and the date on which, in accordance with subparagraph a.(1) above, Contractor notified such third party that the antitrust claim had been assigned to CDOT.
 - b. To take no action which will in any way diminish the value of the claims or rights assigned or dedicated to CDOT hereunder; and
 - c. Promptly to pay over to CDOT its proper share of any payment under an antitrust claim brought on Contractor's behalf by any third party and which claim has been assigned to CDOT hereunder.
3. Further, Contractor agrees that in the event it hires one or more subcontractors to perform any of its duties under the contract, Contractor shall require that each such subcontractor:
 - a. Irrevocably assign to CDOT (as a third party beneficiary) any and all claims that such subcontractor may have or which may thereafter accrue to the subcontractor under federal or state antitrust laws in connection with any goods or services provided by the subcontractor in carrying out the subcontractor's obligations to Contractor;
 - b. Upon becoming aware that a third party has commenced a civil action on the subcontractor's behalf asserting an antitrust claim which has been assigned to CDOT hereunder, shall immediately advise in writing:
 - (1) Such third party that the antitrust claim has been assigned to CDOT, and
 - (2) Contractor and CDOT that such civil action is pending and the date on which, in accordance with subparagraph b.(1) above, the subcontractor notified such third party that the antitrust claim had been assigned to CDOT;
 - c. Take no action which will in any way diminish the value of the claims or rights assigned or dedicated to CDOT hereunder; and
 - d. Promptly pay over to CDOT its proper share of any payment under an antitrust claim brought on the subcontractor's behalf by any third party and which claim has been assigned or dedicated to CDOT pursuant hereto.

I, acting in my capacity as officer of a bidder (bidders if a joint venture) do agree to the above assignment of antitrust claims.

Contractors firm or company name: Sturgeon Electric Company, Inc.	By: 	Date: 9/21/12
	Title: Jeffrey Waneka, Vice President	
2 ND Contractors firm or company name:	By:	Date:
	Title:	

Form 621

**COLORADO DEPARTMENT OF TRANSPORTATION
BIDDERS LIST DATA and UNDERUTILIZED
DBE (UDBE) BID CONDITIONS ASSURANCE**

Project #: SHE R600-391

Location: Denver

Prime Contractor Instructions: This form has two sections, both must be completed and submitted with your bid. Complete **Section I** to list *all* subcontract quotes received (non-DBE *and* DBE). Complete **Section II** to report only Underutilized DBE (UDBE) participation percentages which qualify under the contract goal specification for this project. **Please review CDOT Form #715 instructions before completing Section II.** Attach additional sheets as necessary.

POLICY

It is the policy of the Colorado Department of Transportation that underutilized disadvantaged business enterprises have equal opportunity to participate on projects financed with federal, state or local entity funds. Consistent with 49 Code of Federal Regulations (CFR) Part 26.11, the Bidders List data provided by the Contractors will provide CDOT as accurate data as possible about the universe of DBE and non-DBE firms actively seeking work on its highway construction contracts, for use in setting overall DBE goals.

SECTION I: CDOT BIDDERS LIST INFORMATION (Non-DBEs and DBEs)

- 1) Are all subcontract bids (quotes) received by your firm for this project listed below? Yes No
- 2) *If No*, make certain any additional subcontract bidding information is submitted to the CDOT Business Programs Office before 4:00 pm on the day after bids are opened to ensure CDOT has the best data possible for setting future DBE goals (use the same table format as below):
 CDOT Business Programs Office
 4201 E. Arkansas Ave., Room 200
 Denver, Colorado 80222 FAX: 303-757-9019 EMAIL: eo@dot.state.co.us
- 3) The most recent CDOT Bidders List will be posted online at: www.dot.state.co.us/EEO/DBEProgramPage.htm

Name of firm submitting Bid/Quote	Certified DBE firm?		Work item(s) description	Firm being used?		
	Yes	No		Yes	No	May/Job
1. American Sign Company	X		Traffic Control		X	
2. Frontier Underground, LLC		X	Potholing	X		
3. Innovative Traffic Control Specialist, Inc.		X	Traffic Control	X		
4. KECI Colorado, Inc.		X	Pavement		X	
5. Pavement Maintenance Services, Inc.		X	Pavement		X	
6. Zenitram Traffic Service,	X		Traffic Control		X	
7. Chato's Concrete, LLC	X		Concrete	X		
8. Blanco, Inc.		X	Pipeline Construction	X		
9. Badger Daylighting		X	Hydro Excavation	X		
10. KSI		X	Pavement Markings	X		
11. PWSI		X	Surveying	X		
12. American Industrial	X		Supplier	X		
13.						
14.						

Name of firm submitting Bid/Quote	Certified DBE firm?		Work Item(s) description	Firm being used?		
	Yes	No		Yes	No	Maybe
15.						
16.						
17.						
18.						
19.						
20.						

SECTION II: UNDERUTILIZED DBE (UDBE) PARTICIPATION COMMITMENT

- 1) Total eligible Underutilized DBE (UDBE) percentage amount from Box A below: 21.17 %
 2) Will your company's Underutilized DBE (UDBE) participation commitment meet the contract goal? Yes No
 3) List the UDBE firms, committed work items, and eligible UDBE percentage of your bid committed to each.

UDBE Firm name	Certification #	Committed work item(s)	% Commitment toward DBE Goal*
1. Chato's Concrete	#8399	Concrete	8.12 %
2. American Industrial	#7145	Supplier	11.90 %
3. Blanco Inc.	#8390	Pipeline Construction	1.15 %
4.			. %
5.			. %

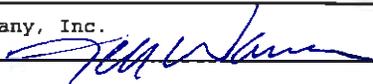
BOX A: TOTAL ELIGIBLE UDBE PERCENTAGE AMOUNT (Round to nearest hundredth) → 21.17 %

* Detailed instructions on how to calculate DBE commitment amounts are available on CDOT Form #715 and in the "Counting DBE Participation Toward Contract Goals and CDOT's annual DBE goal" section of the "DBE - Definitions and Requirements" in the *Standard Special Provisions*.

I understand that, if my company is determined to be the low bidder for the contract on this project, I must submit a completed CDOT Form #715 CERTIFICATION OF UNDERUTILIZED DBE PARTICIPATION for each firm listed in Section II of this form to the Transportation Department by 4:00 pm on the *third* work day after the day bids are opened. The actual amounts submitted on each CDOT Form #715 must equal or exceed the DBE percentage commitments documented on this form. In addition, if my company does not meet the DBE/UDBE goal for this project, I must submit a completed CDOT Form #718 DBE GOOD FAITH EFFORT DOCUMENTATION before 4:00 pm on the *day after* bids are opened. CDOT Form #715s submitted for firms not included on this form, OR for amounts exceeding those listed on this form, will be accepted but NOT counted as Good Faith Efforts. Only the efforts the contractor made *prior* to the bid opening will count as Good Faith Efforts.

I understand my obligation to abide by the Policy stated above Section I. I shall not discriminate on the basis of race, color, age, sex, national origin, or handicap in the bidding process or the performance of contracts.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE IN THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Company Name: Sturgeon Electric Company, Inc.	Date: 09 / 21 / 2012
Company Officer Signature:  Jeffrey Waneka	Title: Vice President

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

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

**NOTICE OF INVITATION FOR BIDS
FEDERAL AID PROJECT NO SHE R600-391
CITY OF DENVER CONTRACT NO. 201207522**

SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

**BID SCHEDULE:
11:00 AM, Local Time
SEPTEMBER 21, 2012**

Sealed bids will be received at the Right-of-Way Counter located on the 2nd floor at 201 West Colfax, Denver, CO 80202, beginning at 10:30 a.m., and no later than 11:00 a.m., on the bid date.

Bids submitted prior to 10:30 a.m. on the specified bid opening date/time shall be presented at the Office of Contract Administration, Attention: Public Works Contract Administration, 201 West Colfax Avenue, Department 614, Denver, Colorado 80202. All properly delivered bids will then be publicly opened and read aloud in Room 1.D.1 on the 1st. floor at 201 West Colfax, Denver, Colorado 80202.

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

GENERAL STATEMENT OF WORK:

Reconstruct and upgrade 6 existing traffic signals within the City and County of Denver. These traffic signals are located at (1) US 285 EB ramp and Sheridan Blvd; (2) US 285 WB ramp and Sheridan Blvd; (3) Sheridan Blvd and 25th Ave Bryon Pl; (4) Alameda Ave and Clay St; (5) Alameda Ave and Lipan St; and (6) Alameda Ave and South Platte River Drive. The project scope is to remove the existing traffic signal equipment (poles, signal and pedestrian indications, controllers, cabinets, pull boxes and associated equipment) at each of these intersections and replace them with a new traffic signal. All new signals shall be constructed in accordance with the current City and County of Denver Traffic Engineering Services standards and specifications. General sidewalk/curb ramps/roadway upgrades are also included in each intersection as part of this project.

ESTIMATED CONSTRUCTION COST:

The estimated cost of construction for this project is between \$1,152,000.00 and \$1,408,000.00.

DOCUMENTS AND BID INFORMATION AVAILABLE:

Contract Documents complete with Technical Specifications and, if applicable, construction drawings will be available on the first day of publication at: www.work4denver.com . To download digital Contract Documents at a cost of \$10.00 per download, reference eBid Document Number #2234497. 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 SEPTEMBER 06, 2012. This meeting will take place at 201 West Colfax Ave, Denver, CO 80202 conference room 4.J.1.

DEADLINE TO SUBMIT QUESTIONS:SEPTEMBER13, 2012 3:00PM local time.

PREQUALIFICATION REQUIREMENTS:

Each bidder must be prequalified as a 3a Traffic Signal Contractor in the \$1,500,000.00 monetary level in accordance with the City's Rules and Regulations Governing Prequalification of Contractors. Each bidder must have submitted a prequalification application a minimum of ten (10) calendar days prior to the bid opening date. Applications must be submitted to the Department of Public Works, Prequalification Section, 201 West Colfax Avenue, Department 506, Denver, Colorado 80202. To view the Rules and Regulations and to obtain a prequalification application, please visit our website at www.denvergov.org/prequalification or call 720-865-2539 for prequalification information ONLY.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION:

Federally-funded construction, reconstruction, remodeling, and professional design services contracts made and entered into by the City and County of Denver are subject to Federal Statutes and Regulations regarding Disadvantaged Business Enterprise participation and all Disadvantaged Business Enterprises Utilization.

The Director of the Division of Small Business Opportunity is authorized to establish project goals for expenditures on construction, reconstruction and remodeling and professional design services work let by the City and County of Denver. The specific goal for this project is:

15% Disadvantaged Business Enterprise (DBE)

The project goal must be met with certified participants as set forth in 49 CFR Part 26. For compliance with good faith effort requirements, as set forth in Part 26, the DBE solicitation level required for this project is 100% of the City and Denver's certified DBE's and 100% of the State of Colorado's Department of Transportation (CDOT's) certified DBE's.

The Director of the Division of Small Business Opportunity urges all participants in the construction, reconstruction, remodeling, and professional design services projects not to discriminate against women and minorities or any other persons and to assist in achieving these goals.

The CDOT Form 347, Certification of EEO Compliance, is no longer required to be submitted in the bid package. This form certified that the contractor/proposed subcontractors were in compliance with the Joint Reporting Committee EEO-1 form requirements. The EEO-1 Report must still be submitted to the Joint Reporting Committee if the contractors and subcontractors meet the eligibility requirements (29CFR 1602.7); CDOT will, however, no longer require certification.

MISCELLANEOUS:

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

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

Publication Dates: August 29, 30, & 31, 2012
Published In: The Daily Journal

If applicable, a shortened version of this Notice of Invitation for Bids and the Statement of Quantities can be viewed on the City and County of Denver website at: www.work4denver.com

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

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

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

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

IB-7 ONLY ONE BID ACCEPTED

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

IB-8 BID GUARANTEE

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

The bid guarantee shall be in the amount of **five percent (5%)** of the total bid unless otherwise specified in the Notice of Invitation for Bids and on the form appearing in the Contract Documents in the Bid Form and Submittal Package. Failure to submit a proper bid guarantee, satisfying all of the requirements specified herein and on the form provided herein shall render the bid non-responsive and may constitute cause for rejection.

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

IB-9 SITE INSPECTION AND INVESTIGATIONS

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

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

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

IB-10 INCONSISTENCIES

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

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

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

IB-11 WITHDRAWAL OF BID

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

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

IB-12 CONTRACTOR'S BULLETIN BOARD

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

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, responsible, 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 re-bid 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 non-responsive 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 contract documents are ready for execution the Apparent Low Bidder who 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 materials purchased prior to the issuance of the 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.

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 WAGE RATE REQUIREMENTS

In preparing any bid hereunder, the Contractor must comply with and should carefully consider all requirements and conditions of the City's Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. and any determinations made by the City pursuant thereto.

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

the actual date of bid opening, to those prevailing wage rates incorporated into the Contract Documents and as modified by any such addenda.

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

IB-23 TAX REQUIREMENTS

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

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

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

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

IB-24 DISCLOSURE OF PRINCIPALS

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

- (1) The name of any officer, director, owner or principal of the business entity, including identity of any shareholder who owns or controls 5% or more of the business entity, and either 1) the names of his or her spouse, and children under eighteen years of age; or 2) a statement that he or she or his or her spouse, or children, if any, under the age of eighteen have or have not made a contribution, as defined in D.R.M.C. 15-32, or contribution in kind, as defined in D.R.M.C. 15-32, to any candidate, as defined in D.R.M.C. 15-32, during the last five years and identifying by name himself or herself or any spouse or child under the age of eighteen who has made such a contribution or contribution in-kind to a candidate.
- (2) The names of any subcontractors or suppliers whose share of the bid exceeds \$100,000.00 of the contract or formal bid amount.
- (3) The names of any unions with which the bidder has a collective bargaining agreement.

If the total bid amount is in excess of \$500,000.00, the information required in (1) above must be provided at the time of bid submittal. and the information required in (2) and (3) must be submitted in a

timely fashion prior to award. The list of subcontractors required by this instrument is different and separate from the bidding list required on BF-4.

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

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

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

IB-25 DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

Department of Transportation (DOT) 49 CFR Part 26 ("Part 26") applies to this Project and will be incorporated into any agreement entered into by the City and contained in County of Denver Bid Documents. It is the policy of DOT and the City and County of Denver that DBEs to ensure non-discrimination in the award and administration of DOT-assisted contracts financed in whole or in part with Federal funds. Consequently, the Bidders must fully comply with the DBE requirements of Part 26 in bidding and performing hereunder.

The contractor, sub recipient or subcontractor shall not discriminate on the basis or race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deemed appropriate. Each contract signed by the contractor with a subcontractor must include this paragraph.

Part 26 provides for the adoption of a good faith goals program, to be administered by the Division of Small Business Opportunity (DSBO). As such, each bidder must comply with the terms and conditions of the Part 26 in making its bid and, if awarded the Contract, in performing all Work thereunder. A bidder's failure to comply with Part 26, any Rules or Regulations promulgated pursuant thereto, or any additional requirements contained herein may render a bid non-responsive and may constitute cause for rejection.

In order to comply with the bid requirements of Part 26, a Bidder shall either meet the established DBE Project goal or, in the alternative, demonstrate that the bidder has made sufficient good faith efforts to meet the goal. In preparing a bid to meet the established DBE Project goal, bidders should consider the following instructions relating to compliance with Part 26:

1. Under Part 26, the Director of the Division of Small Business Opportunity establishes a project goal for this project. 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 Disadvantage Business Enterprise Bidders, Sub-contractors, Suppliers, Manufacturers, or Brokers" the name, address, work description/supply, committed level of participation and other required information for each DBE of any tier which the bidder intends to use in performing the Work on this Project. Only DBEs identified and the levels of participation listed for each on this 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 in determining responsiveness.
3. All DBE firms listed on the Bid Form must be properly certified under guidelines of the Department of Transportation 49 CFR Part 26 by the City of Denver DSBO's Office or the State of Colorado Department of Transportation (CDOT's) Office in order to count towards

meeting the designated goals. Both DSBO and CDOT maintain a current listing of certified DBE firms. The DBE Directory is located at www.dot.state.co.us/app_ucp/. Bidders are encouraged to utilize these directories to assist them in locating DBEs for the work/supply required on the project. The most current directories must be utilized in preparing a bid. DBE certification does not, however, constitute a representation or warranty by the City as to the qualification of any listed firm.

4. In accordance with the requirements of Part 26, DSBO will evaluate each bid to determine the responsiveness of the bid to Part 26 requirements. In determining if a Bidder's committed levels of participation meet or exceed the stated DBE goal, DSBO will 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 DBE percentage goal established for the project to determine the exact dollar amounts of required DBE participation for the Project. These amounts will then be compared against the dollar amounts for the DBE firm(s) committed for participation by the Bidder. If the total dollar amount of participation listed meets or exceeds the established DBE dollar amount goal listed, then the DSBO will determine that goals have been met.
 - b. In addition, DSBO will determine the exact commitment percentage for each listed DBE firm by dividing the dollar amount listed for each firm by the total base bid dollar amount submitted by the bidder. These individual percentages, when totaled for all listed DBEs, will establish the total committed percentage level of DBE participation that the bidder must comply with during the life of the Contract. In all cases, the committed percentage level of DBE participation must equal or exceed the assigned DBE goal for the Project.
 - c. In providing the exact dollar amount of participation for each listed DBE firm 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 both dollar amounts and percentage for DSBO to determine that the bidder has met or exceeded the applicable DBE goal.
 - d. As previously mentioned compliance with the DBE 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 goals. However, should any designated alternate be selected by the City for inclusion in the Contract ultimately awarded, the DBE goal percentage level submitted at bid time, on the base bid, will also apply to the selected alternates and must be maintained for the life of the Contract on the total contract amount, including any alternate work. Thus, even though such participation will not be considered in evaluating bids, Bidders are urged to consider participation in preparing bids for designated alternates.
 - e. On projects where force account or allowance bid items have been included, bidders must meet the DBE goal percentage based upon the total base bid, including all such items that he 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 DBE goal on the remaining reduced amount.
5. In accordance with Part 26 the City and County of Denver will require the total DBE participation commitment to be achieved in accordance with the following:

DBE bidders can count themselves for self-performance toward meeting the DBE goal, but only for the scope of work and at a percentage level they will be actually performing themselves.

DBE credit will be counted only for work actually performed by the DBEs own forces.

Work actually performed by DBEs is deemed to include the cost of materials and supplies purchased and equipment leased by the DBE from non-DBE sources. Work subcontracted can only count if the subcontractor is another DBE.

The entire fee or commission charged by a DBE, if reasonable and not excessive, will be counted.

Under Joint Ventures, the total value of distinct and clearly defined portions of the work of the contract that the DBE performs with its own workforce will be counted.

Each DBE must perform a "commercially useful function" to be counted toward the goal and at least 30% of the work must be performed by a DBE of the total cost of its contract for the DBE to be presumed to be performing a "commercially useful function".

Supplies or materials can be only counted for 60% of the total cost of the materials or supplies toward meeting the DBE goal and a DBE manufacture can count 100% of the cost of the materials or supplies toward the goal. Manufactures' representatives and packagers shall be counted in the same manner as brokers.

In utilizing the DBE participation of a Broker, only the bona fide fees and commissions earned by them for their performance of a commercially useful function will count toward meeting the project goals. The Bidder must separate the bona fide brokerage fees and 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.

6. On or before the fifth (5th) working day after bid opening, all of the Bidders are required to submit an executed "DBE Letter of Intent" for each DBE listed on the Bid Form as a subcontractor, supplier, manufacturer, or broker of any tier. Each Letter of Intent shall be submitted only for the DBEs listed at the time of bid opening, since this is the only participation that will be counted toward satisfaction of the project goals. A form for the DBE Letter of Intent is included with the Bid Form. The DBE 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 DBE and/or that its subcontractor(s) and supplier(s), manufacturer(s), and broker(s) will do so. Each DBE Letter of Intent shall be accompanied by either a copy of the City and County of Denver's (DSBO) DBE certification letter or the State of Colorado's (CDOT) DBE certification letter and DBE Work Codes Sheet for each proposed DBE firm identified at bid time. Bidders are urged to carefully review these Letters before submission to the City to ensure that they are properly completed and executed by the appropriate parties.

In preparing a bid to demonstrate a good faith effort, Bidders should consider the following instructions relating to compliance with Part 26:

1. If any Bidder is unable to meet the designated project DBE goal at the time the bids are opened or elects to present a good faith effort in lieu of or in addition to attempting to satisfy the designated project goals, that Bidder shall submit on or before the fifth (5th) working day after the bid opening a detailed statement, with supporting documentation, setting forth its good faith efforts made prior to bid opening. The different kinds of efforts as well as the quantity and intensity of the efforts will be considered in determining whether the Bidder has made a good faith effort. A Bidder who fails to meet the project goal and cannot show, to the Director's satisfaction, that it made a good faith effort to meet the DBE goal shall be considered non-responsive.
2. For compliance with good faith effort requirements as set forth in Part 26, the DBE solicitation level required for this project is 100% of the City and County of Denver's certified DBE's and 100% of the State of Colorado's Colorado Department of Transportation (CDOT's) certified DBE's. Therefore, both DBE certified lists must be utilized in solicitation

effort in order to meet the good faith effort requirement. The statement of good faith efforts shall include a specific response to each of the following as further defined by rule or regulation. The Bidder must identify the portions of the project that it will self-perform and the Bidder must solicit DBE participation in every category in which it will not self perform. The required level of DBE participation is set forth in the Notice of Invitation for Bids, which is also contained within the project Contract documents. A Bidder may include any additional information the Bidder believes may be relevant. Failure of a Bidder to show good faith efforts as to any one of the following categories shall render its overall good faith showing insufficient and its bid non-responsive. Item (1) through (4) of the D.R.M.C. Section 28-208, Subsection (b) are set forth below:

- a. If pre-bid meetings are scheduled by the City at which DBEs may be informed of subcontracting opportunities under a proposed contract to be bid, attendance at such pre-bid meetings is not mandatory; however, bidders are responsible for the information provided at these meetings. The good faith effort statement must reflect the bidder's knowledge of the information provided at these meetings.
- b. Written verification of the placing of an advertisement soliciting bids from DBEs for three (3) consecutive days in general or construction-related publications approved by the Director. All such advertisements must expressly advertise a given project and expressly state that DBE participation on that project is being sought; other incidental references to the project or listing of the bidder as a plan holder are not sufficient. All such advertisements shall begin at least fifteen (15) days prior to bid opening. If the City publishes notice for bids on a project less than fifteen (15) days prior to bid opening, verification of advertisements for at least four (4) consecutive days shall be provided.
- c. Verification of efforts made by the Bidder to contact, by written notice, all certified DBEs who have the capability to perform the work of the contract, that their interest in the contract is being solicited, in sufficient time to allow the DBEs to participate effectively is required. The notice shall expressly describe the potential subcontracting, supplier or broker opportunities for all applicable certification categories for the particular project.
- d. Verification that, reasonably consistent with industry practice and the Bidder's past practices on similar projects, the Bidder analyzed the needs of the project in light of such industry practice and past practice, together with the goal of facilitating DBE participation on the project, and identified portions of the work to be performed by DBEs in order to achieve the project goal.
- d. For each DBE which contacted the Bidder or which the Bidder contacted or attempted to subcontract with, consistent with industry practice, a statement giving the reasons why the Bidder and the DBE did not succeed in reaching a subcontracting, supplier, manufacturer or broker agreement.
- e. Verification that the Bidder rejected DBEs because they did not submit the lowest bid or they were not qualified. Such verification shall include a verified statement of the amounts of all bids received from potential subcontractors, suppliers, manufacturers or brokers on the project and a verified statement that the Bidder rejected DBEs because they did not submit the lowest bid from among such bids or were not qualified.
- f. Verification that the Bidder made efforts to assist DBEs in obtaining bonds, if any are required.

In accordance with Part 26 the Bidder agrees that it is committed to meeting either the DBE participation goal or the DBE participation set forth in its statement of good faith efforts. This commitment must be expressly indicated on the "Commitment to Disadvantaged Business Enterprise Participation" form included with the Bid Form. This commitment includes the following understandings:

1. The Bidder understands it must maintain the committed DBE participation goal level throughout the life of the Contract and as required in 49 CFR Section 26.53 (f) (1) & (2) which states: A prime may not terminate for convenience a DBE subcontractor (or an approved substitute DBE firm) and then perform the work of the terminated subcontract with its own forces or those of an affiliate, without prior written consent. When a DBE subcontractor is terminated, or fails to complete its work on the contract for any reason, the prime contractor is required to make good faith efforts to find other DBE subcontractor to substitute for the original DBE. These good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the contract goal.
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 toward satisfying the DBE participation goal and other affirmative action efforts.
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, 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 the 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 a DBE at the time of Contract award, then such amendment, change order or other modification shall be contemporaneously submitted to the DSBO. 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 Bidder shall be subject to goals for DBEs equal to the original goal on the Contract which were included in the bid or showing of a good faith efforts.

Prime Contractor agree to pay each subcontractor under this prime contract for satisfactory performance on a contract no later than seven (7) days from the receipt of each payment the prime contractor receives from the City and County of Denver. The prime contractor agrees further to return retainage payments to each subcontractor within thirty (30) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for a good cause following written approval of the City and County of Denver. This clause applies both to DBE and non-DBE subcontractors.

All Bidders are charged with knowledge of and are solely responsible for complying with each requirement of Part 26 in making a bid and, if awarded, in performing the Work described in the Contract Documents. 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 49 CFR Part 26, appropriate DOT Rules and Regulations, or contact the Project's designated DSBO representative at (720) 913-1700.

INSTRUCTIONS TO BIDDERS - All bidders must submit an DSBO "Bidder's List Data Form" for themselves, as well as any subcontractor/supplier/manufacture/manufacture representative/broker that contacted the bidder or that the bidder contacted who provided a bid or quote, regardless if the firm is a DBE or a non-DBE firm. DSBO is required by DOT 49 CFR Part 26 Regulations to create and maintain a bidders list on DOT-assisted projects. Therefore, bidders need to provide these completed forms at the time of bid as a part of their "Bid Form & Submittal Document".

IB-26 DISCLOSURE OF INFORMATION

All submissions and other materials provided or produced pursuant to this Invitation for Bids may be subject to the Colorado Open Records Law, C.R.S. 24-72-201, et seq. As such, bidders are urged to review these disclosure requirements and any exceptions to disclosure of information furnished by another party and, prior to submission of a bid to the City, appropriately identify materials that are not subject to

disclosure. In the event of a request to the City for disclosure of such information, the City shall advise the bidder of such request to give the bidder an opportunity to object to the disclosure of designated confidential materials furnished to the City. In the event of the filing of a lawsuit to compel such disclosure, the City will tender all such material to the court for judicial determination of the issue of disclosure and each bidder agrees to intervene in such lawsuit to protect and assert its claims of privilege against disclosure of such material. Each bidder further agrees to defend, indemnify and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of the bidder's intervention to protect and assert its claims of privilege against disclosure under the Open Records Law including, but not limited to, prompt reimbursement to the City of all reasonable attorney fees, costs and damages that the City may incur directly or may be ordered to pay by such court.

IB-27 GENERAL BIDDING INFORMATION

Bidders are instructed to contact the Contract Administrator designated below for this Project for pre-bid, post-bid and general City bidding information. Bidders can also visit DenverGov.com for information, both general and project specific. The Contract Administrator assigned to this project is Jo Ann Phillips who can be reached via email at joann.phillips@denvergov.org.

IB-28 FEDERAL REQUIREMENTS

This project is funded, in whole or in part, by federal funding made available through the Federal Highway Administration ("FHWA") and administered by the Colorado Department of Transportation ("CDOT"). As such, each bidder must review and comply with certain bid requirements (the "Federal Forms") in formulating and submitting its bid for the Project, and, if awarded a contract pursuant to this bid, must comply with certain "Federal Requirements." The required Federal Forms are included in the Bid Package at pages BF-24 through BF-28. The Federal Requirements are attached to the Bid Document Package, pages at BDP-63 through BDP-79. The Contractor shall be presumed to have considered and completed all Federal Requirements and Forms as part of its bid and shall be presumed to have carefully considered and accounted for all costs of complying with the Federal Requirements in formulating and submitting a bid hereunder.

IB-29 PAYMENT PROCEDURE REQUIREMENTS

Contractor recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System (CPM System) for this Project. Bidders are urged, when preparing a bid, to contact the Textura® Corporation for pricing schedule and fees, as all fees associated with the CPM System are to be paid by the Contractor and subcontractor for billings for work performed.

**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.

APPENDIX B

EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. 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 considerations for employment without regard to race, color, religion, sex, or national origin.
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. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.
5. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor 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 Government contracts or federally assisted construction contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
7. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. 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 provision, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

NOTICES TO BE POSTED PER PARAGRAPH (1) AND (3) OF THE EEO CLAUSE

EQUAL EMPLOYMENT OPPORTUNITY IS THE LAW

**Discrimination is Prohibited by
the Civil Rights Act of 1964
and by Executive Order No. 11246**

Title VII of the Civil Rights Act of 1964

Administered by: The Equal Employment Opportunity Commission

Prohibits discrimination because of Race, Color, Religion, sex, or National Origin by Employers with 25 or more employees, by Labor Organizations with a hiring hall of 25 or more members, by Employment Agencies, and b Joint Labor-Management Committees for Apprenticeship or Training.

ANY PERSON who believes that he or she has been discriminated against SHOULD CONTACT:

The Equal Employment Opportunity Commission (EEOC)
2401 E Street, NW
Washington, D.C. 20506

Executive Order No. 11256

Administered by: The Office of Federal Contract Compliance Programs

Prohibits discrimination because of Race, Color, Religion, Sex, or National Origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment, by all Federal Government Contractors and Subcontractors, and by Contractors Performing Work Under a Federal Assisted Construction Contract, regardless of the number of employees in either case.

ANY PERSON who believes that he or she has been discriminated against SHOULD CONTACT:

The Office of Federal Contract Compliance Programs
U. S. Department of Labor
Washington, D.C. 20210

APPENDIX E

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246, as amended)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area are as follows:

Timetables: Until Further Notice

Goals:

- (a) Minority Participation in Each Trade: 13.8 percent
- (b) Female Participation in Each Trade: 6.9 percent

These goals are applicable to all the contractor's construction work (whether or not it is Federal on Federally-assisted) performed in the covered area. If the contractor performs construction work in a geographic area located outside of the covered area, it shall apply the goal established for such geographic area where the work is actually performed. With regard to this second area, the contractor also is subject to the goal for both its Federally involved and non-Federally involved construction.

The contractor's compliance with the executive order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goal. The hours of minority employment and training must be substantially uniform throughout the length of the contract, and in each grade, and the contract shall make a good faith effort to employ minorities evenly on each of its projects. The transfer of minority employees or trainees from contractor to contractor or from project to project, for the sole purpose of meeting the contractor's goal, shall be a violation of the contract, the executive order, and the regulations in 41 CFR Part 60-4. Compliance with the goal will be measured against the total work hours performed.

3. The contractor shall provide written notification to the Director, OFCCP, within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employee identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographic area in which the contract is performed.
4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is the City and County of Denver, Colorado.

STANDARD FEDERAL ASSURANCES

NOTE: As used below the term "contractor" shall mean and include the "Party of the Second Part," and the term "sponsor" shall mean the "City".

During the term of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulations. The contractor shall comply with the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

2. Nondiscrimination. The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, creed or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontractors, Including Procurements of Materials and Equipment. In all solicitations either by competitive bidding or negotiations made by the contractor for work to be performed under a subcontract, including procurements or materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. Information and Reports. The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the sponsor, as appropriate, and shall set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance. In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the sponsor shall impose such contract sanctions as it may determine to be appropriate, including, but not limited to:

- a. Withholding of payments to the contractor under the contract until the contractor complies, and/or
- b. Cancellation, termination, or suspension of the contract, in whole or in part.

6. Incorporation of Provisions. The contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the sponsor or may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the sponsor to enter into such litigation to protect the interests of the sponsor and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS (41 CFR 60-4.3)
(VERSION 2, 4/23/90)**

1. As used in these specifications:

- a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
- b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
- c. "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
- d. "Minority" includes:
 - (1) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);
 - (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained

from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the contractor has a collective bargaining agreement to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the contractor during the training period and the contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or female sent by the contractor, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by

publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint

contractor union, contractor community, or other similar groups of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally,) the contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

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

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

EQUAL OPPORTUNITY PROVISIONS (Cont'd)

A. REQUIREMENTS - AN AFFIRMATIVE ACTION PLAN:

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

1. GOALS AND TIMETABLES:

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

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

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

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

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

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

2. SPECIFIC AFFIRMATIVE ACTION STEPS:

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

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

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

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

3. NON - DISCRIMINATION:

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

4. COMPLIANCE AND ENFORCEMENT:

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

A. 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 Division of Small Business Opportunity 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.

B. 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.

C. GENERAL REQUIREMENTS:

Contractors are responsible for informing their subcontractors in writing regardless of tier, as to their respective obligations. Whenever a Contractor subcontracts a portion of work in any trade covered by these Bid Conditions, it shall include these Bid Conditions in such subcontracts and each subcontractor shall be bound by these Bid Conditions to the full extent as if it were the prime contractor. The Contractor shall not, however, be held accountable for the failure of its subcontractors to fulfill their obligations under these Bid Conditions. However, the prime contractor shall give notice to the Director of any refusal or failure of any subcontractor to fulfill the obligations under these Bid Conditions. A subcontractor's failure to comply will be treated in the same manner as such failure by a prime contractor.

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

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

**FEDERAL AID PROJECT NO. SHE R600-391
CITY OF DENVER CONTRACT NO. 201207522**

SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

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

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

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

WITNESSETH, Commencing on **August 29, 2012**, 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>FEDERAL AID PROJECT NO. SHE R600-391</p> <p>CITY OF DENVER CONTRACT NO. 201207522</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
Bid Bond
Addenda (as applicable)
DBE Documents
Equal Employment Opportunity Provisions (Appendices A, B, E and F)
Bid Form
Commitment to DBE Participation
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 **300 (Three Hundred Days)** consecutive calendar days from the effective date of said Notice, plus such extension or extensions of time as may be granted in accordance with the provisions of the General Contract Conditions and any applicable Special Contract Conditions.

4. TERMS OF PAYMENT

The City agrees to pay the Contractor for the performance of all of the Work required under this Contract, and the Contractor agrees to accept as the Contractor's full and only compensation therefore, such sum or sums of money as may be proper in accordance with the price or prices set forth in the Contractor's Bid Form hereto attached and made a part hereof for **bid item numbers 202-00019 to 700-70592 (Eighty Seven [87] total bid items), the total estimated cost thereof being One Million Five Hundred Eight Thousand Three Hundred Eighty Four Dollars and No Cents (\$1,508,384.00)**. Adjustments to said Contract Amount and payment of amounts due hereunder shall be made in accordance with the provisions of the General Contract Conditions and any applicable Special Contract Conditions.

5. NO DISCRIMINATION IN EMPLOYMENT

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

6. DBE AND EQUAL OPPORTUNITY REQUIREMENTS

The Contractor agrees to comply with all requirements of the City's Equal Employment Opportunity program and the Federal Disadvantaged Business Enterprise Participation program as set out in Article III, Division 2, Chapter 28 of the Denver Revised Municipal Code, and any rules, regulations and guidelines set forth thereunder for such programs. This compliance shall include the obligation to maintain throughout the term of the contract that level of DBE participation upon which the Contract was initially awarded, unless otherwise authorized by the law or any rules, regulations or guidelines.

7. WAGE RATE REQUIREMENTS

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

8. APPLICABILITY OF LAWS

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

9. APPROPRIATION

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

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

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

10. APPROVALS

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

11. ASSIGNMENT

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

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

Construction Contract General Conditions

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CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

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

**NOTICE OF INVITATION FOR BIDS
FEDERAL AID PROJECT NO SHE R600-391
CITY OF DENVER CONTRACT NO. 201207522**

SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

**BID SCHEDULE:
11:00 AM, Local Time
SEPTEMBER 21, 2012**

Sealed bids will be received at the Right-of-Way Counter located on the 2nd floor at 201 West Colfax, Denver, CO 80202, beginning at 10:30 a.m., and no later than 11:00 a.m., on the bid date.

Bids submitted prior to 10:30 a.m. on the specified bid opening date/time shall be presented at the Office of Contract Administration, Attention: Public Works Contract Administration, 201 West Colfax Avenue, Department 614, Denver, Colorado 80202. All properly delivered bids will then be publicly opened and read aloud in Room 1.D.1 on the 1st. floor at 201 West Colfax, Denver, Colorado 80202.

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

GENERAL STATEMENT OF WORK:

Reconstruct and upgrade 6 existing traffic signals within the City and County of Denver. These traffic signals are located at (1) US 285 EB ramp and Sheridan Blvd; (2) US 285 WB ramp and Sheridan Blvd; (3) Sheridan Blvd and 25th Ave Bryon Pl; (4) Alameda Ave and Clay St; (5) Alameda Ave and Lipan St; and (6) Alameda Ave and South Platte River Drive. The project scope is to remove the existing traffic signal equipment (poles, signal and pedestrian indications, controllers, cabinets, pull boxes and associated equipment) at each of these intersections and replace them with a new traffic signal. All new signals shall be constructed in accordance with the current City and County of Denver Traffic Engineering Services standards and specifications. General sidewalk/curb ramps/roadway upgrades are also included in each intersection as part of this project.

ESTIMATED CONSTRUCTION COST:

The estimated cost of construction for this project is between \$1,152,000.00 and \$1,408,000.00.

DOCUMENTS AND BID INFORMATION AVAILABLE:

Contract Documents complete with Technical Specifications and, if applicable, construction drawings will be available on the first day of publication at: www.work4denver.com . To download digital Contract Documents at a cost of \$10.00 per download, reference eBid Document Number #2234497. 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 SEPTEMBER 06, 2012. This meeting will take place at 201 West Colfax Ave, Denver, CO 80202 conference room 4.J.1.

DEADLINE TO SUBMIT QUESTIONS:SEPTEMBER13, 2012 3:00PM local time.

PREQUALIFICATION REQUIREMENTS:

Each bidder must be prequalified as a 3a Traffic Signal Contractor in the \$1,500,000.00 monetary level in accordance with the City's Rules and Regulations Governing Prequalification of Contractors. Each bidder must have submitted a prequalification application a minimum of ten (10) calendar days prior to the bid opening date. Applications must be submitted to the Department of Public Works, Prequalification Section, 201 West Colfax Avenue, Department 506, Denver, Colorado 80202. To view the Rules and Regulations and to obtain a prequalification application, please visit our website at www.denvergov.org/prequalification or call 720-865-2539 for prequalification information ONLY.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION:

Federally-funded construction, reconstruction, remodeling, and professional design services contracts made and entered into by the City and County of Denver are subject to Federal Statutes and Regulations regarding Disadvantaged Business Enterprise participation and all Disadvantaged Business Enterprises Utilization.

The Director of the Division of Small Business Opportunity is authorized to establish project goals for expenditures on construction, reconstruction and remodeling and professional design services work let by the City and County of Denver. The specific goal for this project is:

15% Disadvantaged Business Enterprise (DBE)

The project goal must be met with certified participants as set forth in 49 CFR Part 26. For compliance with good faith effort requirements, as set forth in Part 26, the DBE solicitation level required for this project is 100% of the City and Denver's certified DBE's and 100% of the State of Colorado's Department of Transportation (CDOT's) certified DBE's.

The Director of the Division of Small Business Opportunity urges all participants in the construction, reconstruction, remodeling, and professional design services projects not to discriminate against women and minorities or any other persons and to assist in achieving these goals.

The CDOT Form 347, Certification of EEO Compliance, is no longer required to be submitted in the bid package. This form certified that the contractor/proposed subcontractors were in compliance with the Joint Reporting Committee EEO-1 form requirements. The EEO-1 Report must still be submitted to the Joint Reporting Committee if the contractors and subcontractors meet the eligibility requirements (29CRF 1602.7); CDOT will, however, no longer require certification.

MISCELLANEOUS:

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

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

Publication Dates: August 29, 30,& 31, 2012
Published In: The Daily Journal

If applicable, a shortened version of this Notice of Invitation for Bids and the Statement of Quantities can be viewed on the City and County of Denver website at: www.work4denver.com

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

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

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

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

IB-7 ONLY ONE BID ACCEPTED

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

IB-8 BID GUARANTEE

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

The bid guarantee shall be in the amount of **five percent (5%)** of the total bid unless otherwise specified in the Notice of Invitation for Bids and on the form appearing in the Contract Documents in the Bid Form and Submittal Package. Failure to submit a proper bid guarantee, satisfying all of the requirements specified herein and on the form provided herein shall render the bid non-responsive and may constitute cause for rejection.

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

IB-9 SITE INSPECTION AND INVESTIGATIONS

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

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

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

IB-10 INCONSISTENCIES

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

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

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

IB-11 WITHDRAWAL OF BID

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

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

IB-12 CONTRACTOR'S BULLETIN BOARD

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

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, responsible, 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 re-bid 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 non-responsive 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 contract documents are ready for execution the Apparent Low Bidder who 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 materials purchased prior to the issuance of the 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.

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 WAGE RATE REQUIREMENTS

In preparing any bid hereunder, the Contractor must comply with and should carefully consider all requirements and conditions of the City's Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. and any determinations made by the City pursuant thereto.

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

the actual date of bid opening, to those prevailing wage rates incorporated into the Contract Documents and as modified by any such addenda.

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

IB-23 TAX REQUIREMENTS

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

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

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

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

IB-24 DISCLOSURE OF PRINCIPALS

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

- (1) The name of any officer, director, owner or principal of the business entity, including identity of any shareholder who owns or controls 5% or more of the business entity, and either 1) the names of his or her spouse, and children under eighteen years of age; or 2) a statement that he or she or his or her spouse, or children, if any, under the age of eighteen have or have not made a contribution, as defined in D.R.M.C. 15-32, or contribution in kind, as defined in D.R.M.C. 15-32, to any candidate, as defined in D.R.M.C. 15-32, during the last five years and identifying by name himself or herself or any spouse or child under the age of eighteen who has made such a contribution or contribution in-kind to a candidate.
- (2) The names of any subcontractors or suppliers whose share of the bid exceeds \$100,000.00 of the contract or formal bid amount.
- (3) The names of any unions with which the bidder has a collective bargaining agreement.

If the total bid amount is in excess of \$500,000.00, the information required in (1) above must be provided at the time of bid submittal. and the information required in (2) and (3) must be submitted in a

timely fashion prior to award. The list of subcontractors required by this instrument is different and separate from the bidding list required on BF-4.

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

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

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

IB-25 DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS

Department of Transportation (DOT) 49 CFR Part 26 ("Part 26") applies to this Project and will be incorporated into any agreement entered into by the City and contained in County of Denver Bid Documents. It is the policy of DOT and the City and County of Denver that DBEs to ensure non-discrimination in the award and administration of DOT-assisted contracts financed in whole or in part with Federal funds. Consequently, the Bidders must fully comply with the DBE requirements of Part 26 in bidding and performing hereunder.

The contractor, sub recipient or subcontractor shall not discriminate on the basis or race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deemed appropriate. Each contract signed by the contractor with a subcontractor must include this paragraph.

Part 26 provides for the adoption of a good faith goals program, to be administered by the Division of Small Business Opportunity (DSBO). As such, each bidder must comply with the terms and conditions of the Part 26 in making its bid and, if awarded the Contract, in performing all Work thereunder. A bidder's failure to comply with Part 26, any Rules or Regulations promulgated pursuant thereto, or any additional requirements contained herein may render a bid non-responsive and may constitute cause for rejection.

In order to comply with the bid requirements of Part 26, a Bidder shall either meet the established DBE Project goal or, in the alternative, demonstrate that the bidder has made sufficient good faith efforts to meet the goal. In preparing a bid to meet the established DBE Project goal, bidders should consider the following instructions relating to compliance with Part 26:

1. Under Part 26, the Director of the Division of Small Business Opportunity establishes a project goal for this project. 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 Disadvantage Business Enterprise Bidders, Sub-contractors, Suppliers, Manufacturers, or Brokers" the name, address, work description/supply, committed level of participation and other required information for each DBE of any tier which the bidder intends to use in performing the Work on this Project. Only DBEs identified and the levels of participation listed for each on this 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 in determining responsiveness.
3. All DBE firms listed on the Bid Form must be properly certified under guidelines of the Department of Transportation 49 CFR Part 26 by the City of Denver DSBO's Office or the State of Colorado Department of Transportation (CDOT's) Office in order to count towards

meeting the designated goals. Both DSBO and CDOT maintain a current listing of certified DBE firms. The DBE Directory is located at www.dot.state.co.us/app_ucp/. Bidders are encouraged to utilize these directories to assist them in locating DBEs for the work/supply required on the project. The most current directories must be utilized in preparing a bid. DBE certification does not, however, constitute a representation or warranty by the City as to the qualification of any listed firm.

4. In accordance with the requirements of Part 26, DSBO will evaluate each bid to determine the responsiveness of the bid to Part 26 requirements. In determining if a Bidder's committed levels of participation meet or exceed the stated DBE goal, DSBO will 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 DBE percentage goal established for the project to determine the exact dollar amounts of required DBE participation for the Project. These amounts will then be compared against the dollar amounts for the DBE firm(s) committed for participation by the Bidder. If the total dollar amount of participation listed meets or exceeds the established DBE dollar amount goal listed, then the DSBO will determine that goals have been met.
 - b. In addition, DSBO will determine the exact commitment percentage for each listed DBE firm by dividing the dollar amount listed for each firm by the total base bid dollar amount submitted by the bidder. These individual percentages, when totaled for all listed DBEs, will establish the total committed percentage level of DBE participation that the bidder must comply with during the life of the Contract. In all cases, the committed percentage level of DBE participation must equal or exceed the assigned DBE goal for the Project.
 - c. In providing the exact dollar amount of participation for each listed DBE firm 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 both dollar amounts and percentage for DSBO to determine that the bidder has met or exceeded the applicable DBE goal.
 - d. As previously mentioned compliance with the DBE 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 goals. However, should any designated alternate be selected by the City for inclusion in the Contract ultimately awarded, the DBE goal percentage level submitted at bid time, on the base bid, will also apply to the selected alternates and must be maintained for the life of the Contract on the total contract amount, including any alternate work. Thus, even though such participation will not be considered in evaluating bids, Bidders are urged to consider participation in preparing bids for designated alternates.
 - e. On projects where force account or allowance bid items have been included, bidders must meet the DBE goal percentage based upon the total base bid, including all such items that he 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 DBE goal on the remaining reduced amount.
5. In accordance with Part 26 the City and County of Denver will require the total DBE participation commitment to be achieved in accordance with the following:

DBE bidders can count themselves for self-performance toward meeting the DBE goal, but only for the scope of work and at a percentage level they will be actually performing themselves.

DBE credit will be counted only for work actually performed by the DBEs own forces.

Work actually performed by DBEs is deemed to include the cost of materials and supplies purchased and equipment leased by the DBE from non-DBE sources. Work subcontracted can only count if the subcontractor is another DBE.

The entire fee or commission charged by a DBE, if reasonable and not excessive, will be counted.

Under Joint Ventures, the total value of distinct and clearly defined portions of the work of the contract that the DBE performs with its own workforce will be counted.

Each DBE must perform a "commercially useful function" to be counted toward the goal and at least 30% of the work must be performed by a DBE of the total cost of its contract for the DBE to be presumed to be performing a "commercially useful function".

Supplies or materials can be only counted for 60% of the total cost of the materials or supplies toward meeting the DBE goal and a DBE manufacture can count 100% of the cost of the materials or supplies toward the goal. Manufactures' representatives and packagers shall be counted in the same manner as brokers.

In utilizing the DBE participation of a Broker, only the bona fide fees and commissions earned by them for their performance of a commercially useful function will count toward meeting the project goals. The Bidder must separate the bona fide brokerage fees and 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.

6. On or before the fifth (5th) working day after bid opening, all of the Bidders are required to submit an executed "DBE Letter of Intent" for each DBE listed on the Bid Form as a subcontractor, supplier, manufacturer, or broker of any tier. Each Letter of Intent shall be submitted only for the DBEs listed at the time of bid opening, since this is the only participation that will be counted toward satisfaction of the project goals. A form for the DBE Letter of Intent is included with the Bid Form. The DBE 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 DBE and/or that its subcontractor(s) and supplier(s), manufacturer(s), and broker(s) will do so. Each DBE Letter of Intent shall be accompanied by either a copy of the City and County of Denver's (DSBO) DBE certification letter or the State of Colorado's (CDOT) DBE certification letter and DBE Work Codes Sheet for each proposed DBE firm identified at bid time. Bidders are urged to carefully review these Letters before submission to the City to ensure that they are properly completed and executed by the appropriate parties.

In preparing a bid to demonstrate a good faith effort, Bidders should consider the following instructions relating to compliance with Part 26:

1. If any Bidder is unable to meet the designated project DBE goal at the time the bids are opened or elects to present a good faith effort in lieu of or in addition to attempting to satisfy the designated project goals, that Bidder shall submit on or before the fifth (5th) working day after the bid opening a detailed statement, with supporting documentation, setting forth its good faith efforts made prior to bid opening. The different kinds of efforts as well as the quantity and intensity of the efforts will be considered in determining whether the Bidder has made a good faith effort. A Bidder who fails to meet the project goal and cannot show, to the Director's satisfaction, that it made a good faith effort to meet the DBE goal shall be considered non-responsive.
2. For compliance with good faith effort requirements as set forth in Part 26, the DBE solicitation level required for this project is 100% of the City and County of Denver's certified DBE's and 100% of the State of Colorado's Colorado Department of Transportation (CDOT's) certified DBE's. Therefore, both DBE certified lists must be utilized in solicitation

effort in order to meet the good faith effort requirement. The statement of good faith efforts shall include a specific response to each of the following as further defined by rule or regulation. The Bidder must identify the portions of the project that it will self-perform and the Bidder must solicit DBE participation in every category in which it will not self perform. The required level of DBE participation is set forth in the Notice of Invitation for Bids, which is also contained within the project Contract documents. A Bidder may include any additional information the Bidder believes may be relevant. Failure of a Bidder to show good faith efforts as to any one of the following categories shall render its overall good faith showing insufficient and its bid non-responsive. Item (1) through (4) of the D.R.M.C. Section 28-208, Subsection (b) are set forth below:

- a. If pre-bid meetings are scheduled by the City at which DBEs may be informed of subcontracting opportunities under a proposed contract to be bid, attendance at such pre-bid meetings is not mandatory; however, bidders are responsible for the information provided at these meetings. The good faith effort statement must reflect the bidder's knowledge of the information provided at these meetings.
- b. Written verification of the placing of an advertisement soliciting bids from DBEs for three (3) consecutive days in general or construction-related publications approved by the Director. All such advertisements must expressly advertise a given project and expressly state that DBE participation on that project is being sought; other incidental references to the project or listing of the bidder as a plan holder are not sufficient. All such advertisements shall begin at least fifteen (15) days prior to bid opening. If the City publishes notice for bids on a project less than fifteen (15) days prior to bid opening, verification of advertisements for at least four (4) consecutive days shall be provided.
- c. Verification of efforts made by the Bidder to contact, by written notice, all certified DBEs who have the capability to perform the work of the contract, that their interest in the contract is being solicited, in sufficient time to allow the DBEs to participate effectively is required. The notice shall expressly describe the potential subcontracting, supplier or broker opportunities for all applicable certification categories for the particular project.
- d. Verification that, reasonably consistent with industry practice and the Bidder's past practices on similar projects, the Bidder analyzed the needs of the project in light of such industry practice and past practice, together with the goal of facilitating DBE participation on the project, and identified portions of the work to be performed by DBEs in order to achieve the project goal.
- d. For each DBE which contacted the Bidder or which the Bidder contacted or attempted to subcontract with, consistent with industry practice, a statement giving the reasons why the Bidder and the DBE did not succeed in reaching a subcontracting, supplier, manufacturer or broker agreement.
- e. Verification that the Bidder rejected DBEs because they did not submit the lowest bid or they were not qualified. Such verification shall include a verified statement of the amounts of all bids received from potential subcontractors, suppliers, manufacturers or brokers on the project and a verified statement that the Bidder rejected DBEs because they did not submit the lowest bid from among such bids or were not qualified.
- f. Verification that the Bidder made efforts to assist DBEs in obtaining bonds, if any are required.

In accordance with Part 26 the Bidder agrees that it is committed to meeting either the DBE participation goal or the DBE participation set forth in its statement of good faith efforts. This commitment must be expressly indicated on the "Commitment to Disadvantaged Business Enterprise Participation" form included with the Bid Form. This commitment includes the following understandings:

1. The Bidder understands it must maintain the committed DBE participation goal level throughout the life of the Contract and as required in 49 CFR Section 26.53 (f) (1) & (2) which states: A prime may not terminate for convenience a DBE subcontractor (or an approved substitute DBE firm) and then perform the work of the terminated subcontract with its own forces or those of an affiliate, without prior written consent. When a DBE subcontractor is terminated, or fails to complete its work on the contract for any reason, the prime contractor is required to make good faith efforts to find other DBE subcontractor to substitute for the original DBE. These good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the contract goal.
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 toward satisfying the DBE participation goal and other affirmative action efforts.
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, 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 the 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 a DBE at the time of Contract award, then such amendment, change order or other modification shall be contemporaneously submitted to the DSBO. 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 Bidder shall be subject to goals for DBEs equal to the original goal on the Contract which were included in the bid or showing of a good faith efforts.

Prime Contractor agree to pay each subcontractor under this prime contract for satisfactory performance on a contract no later than seven (7) days from the receipt of each payment the prime contractor receives from the City and County of Denver. The prime contractor agrees further to return retainage payments to each subcontractor within thirty (30) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for a good cause following written approval of the City and County of Denver. This clause applies both to DBE and non-DBE subcontractors.

All Bidders are charged with knowledge of and are solely responsible for complying with each requirement of Part 26 in making a bid and, if awarded, in performing the Work described in the Contract Documents. 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 49 CFR Part 26, appropriate DOT Rules and Regulations, or contact the Project's designated DSBO representative at (720) 913-1700.

INSTRUCTIONS TO BIDDERS - All bidders must submit an DSBO "Bidder's List Data Form" for themselves, as well as any subcontractor/supplier/manufacture/manufacture representative/broker that contacted the bidder or that the bidder contacted who provided a bid or quote, regardless if the firm is a DBE or a non-DBE firm. DSBO is required by DOT 49 CFR Part 26 Regulations to create and maintain a bidders list on DOT-assisted projects. Therefore, bidders need to provide these completed forms at the time of bid as a part of their "Bid Form & Submittal Document".

IB-26 DISCLOSURE OF INFORMATION

All submissions and other materials provided or produced pursuant to this Invitation for Bids may be subject to the Colorado Open Records Law, C.R.S. 24-72-201, et seq. As such, bidders are urged to review these disclosure requirements and any exceptions to disclosure of information furnished by another party and, prior to submission of a bid to the City, appropriately identify materials that are not subject to

disclosure. In the event of a request to the City for disclosure of such information, the City shall advise the bidder of such request to give the bidder an opportunity to object to the disclosure of designated confidential materials furnished to the City. In the event of the filing of a lawsuit to compel such disclosure, the City will tender all such material to the court for judicial determination of the issue of disclosure and each bidder agrees to intervene in such lawsuit to protect and assert its claims of privilege against disclosure of such material. Each bidder further agrees to defend, indemnify and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of the bidder's intervention to protect and assert its claims of privilege against disclosure under the Open Records Law including, but not limited to, prompt reimbursement to the City of all reasonable attorney fees, costs and damages that the City may incur directly or may be ordered to pay by such court.

IB-27 GENERAL BIDDING INFORMATION

Bidders are instructed to contact the Contract Administrator designated below for this Project for pre-bid, post-bid and general City bidding information. Bidders can also visit DenverGov.com for information, both general and project specific. The Contract Administrator assigned to this project is Jo Ann Phillips who can be reached via email at joann.phillips@denvergov.org.

IB-28 FEDERAL REQUIREMENTS

This project is funded, in whole or in part, by federal funding made available through the Federal Highway Administration ("FHWA") and administered by the Colorado Department of Transportation ("CDOT"). As such, each bidder must review and comply with certain bid requirements (the "Federal Forms") in formulating and submitting its bid for the Project, and, if awarded a contract pursuant to this bid, must comply with certain "Federal Requirements." The required Federal Forms are included in the Bid Package at pages BF-24 through BF-28. The Federal Requirements are attached to the Bid Document Package, pages at BDP-63 through BDP-79. The Contractor shall be presumed to have considered and completed all Federal Requirements and Forms as part of its bid and shall be presumed to have carefully considered and accounted for all costs of complying with the Federal Requirements in formulating and submitting a bid hereunder.

IB-29 PAYMENT PROCEDURE REQUIREMENTS

Contractor recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System (CPM System) for this Project. Bidders are urged, when preparing a bid, to contact the Textura® Corporation for pricing schedule and fees, as all fees associated with the CPM System are to be paid by the Contractor and subcontractor for billings for work performed.

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.

APPENDIX B

EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. 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 considerations for employment without regard to race, color, religion, sex, or national origin.
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. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.
5. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor 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 Government contracts or federally assisted construction contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
7. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. 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 provision, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

NOTICES TO BE POSTED PER PARAGRAPH (1) AND (3) OF THE EEO CLAUSE

EQUAL EMPLOYMENT OPPORTUNITY IS THE LAW

**Discrimination is Prohibited by
the Civil Rights Act of 1964
and by Executive Order No. 11246**

Title VII of the Civil Rights Act of 1964

Administered by: The Equal Employment Opportunity Commission

Prohibits discrimination because of Race, Color, Religion, sex, or National Origin by Employers with 25 or more employees, by Labor Organizations with a hiring hall of 25 or more members, by Employment Agencies, and b Joint Labor-Management Committees for Apprenticeship or Training.

ANY PERSON who believes that he or she has been discriminated against SHOULD CONTACT:

The Equal Employment Opportunity Commission (EEOC)
2401 E Street, NW
Washington, D.C. 20506

Executive Order No. 11256

Administered by: The Office of Federal Contract Compliance Programs

Prohibits discrimination because of Race, Color, Religion, Sex, or National Origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment, by all Federal Government Contractors and Subcontractors, and by Contractors Performing Work Under a Federal Assisted Construction Contract, regardless of the number of employees in either case.

ANY PERSON who believes that he or she has been discriminated against SHOULD CONTACT:

The Office of Federal Contract Compliance Programs
U. S. Department of Labor
Washington, D.C. 20210

APPENDIX E

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246, as amended)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area are as follows:

Timetables: Until Further Notice

Goals:

- (a) Minority Participation in Each Trade: 13.8 percent
- (b) Female Participation in Each Trade: 6.9 percent

These goals are applicable to all the contractor's construction work (whether or not it is Federal on Federally-assisted) performed in the covered area. If the contractor performs construction work in a geographic area located outside of the covered area, it shall apply the goal established for such geographic area where the work is actually performed. With regard to this second area, the contractor also is subject to the goal for both its Federally involved and non-Federally involved construction.

The contractor's compliance with the executive order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goal. The hours of minority employment and training must be substantially uniform throughout the length of the contract, and in each grade, and the contract shall make a good faith effort to employ minorities evenly on each of its projects. The transfer of minority employees or trainees from contractor to contractor or from project to project, for the sole purpose of meeting the contractor's goal, shall be a violation of the contract, the executive order, and the regulations in 41 CFR Part 60-4. Compliance with the goal will be measured against the total work hours performed.

3. The contractor shall provide written notification to the Director, OFCCP, within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employee identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographic area in which the contract is performed.
4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is the City and County of Denver, Colorado.

STANDARD FEDERAL ASSURANCES

NOTE: As used below the term "contractor" shall mean and include the "Party of the Second Part," and the term "sponsor" shall mean the "City".

During the term of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulations. The contractor shall comply with the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

2. Nondiscrimination. The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, creed or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontractors, Including Procurements of Materials and Equipment. In all solicitations either by competitive bidding or negotiations made by the contractor for work to be performed under a subcontract, including procurements or materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. Information and Reports. The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the sponsor, as appropriate, and shall set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance. In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the sponsor shall impose such contract sanctions as it may determine to be appropriate, including, but not limited to:

- a. Withholding of payments to the contractor under the contract until the contractor complies, and/or
- b. Cancellation, termination, or suspension of the contract, in whole or in part.

6. Incorporation of Provisions. The contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the sponsor or may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the sponsor to enter into such litigation to protect the interests of the sponsor and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS (41 CFR 60-4.3)
(VERSION 2, 4/23/90)**

1. As used in these specifications:

- a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
- b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
- c. "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
- d. "Minority" includes:
 - (1) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);
 - (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained

from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the contractor has a collective bargaining agreement to refer either minorities or women shall excuse the contractor's obligations under these specifications, Executive Order 11246 or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the contractor during the training period and the contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or female sent by the contractor, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by

publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the contractor's EEO policy with other contractors and subcontractors with whom the contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint

contractor union, contractor community, or other similar groups of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's and failure of such a group to fulfill an obligation shall not be a defense for the contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally,) the contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

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

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

EQUAL OPPORTUNITY PROVISIONS (Cont'd)

A. REQUIREMENTS - AN AFFIRMATIVE ACTION PLAN:

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

1. GOALS AND TIMETABLES:

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

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

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

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

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

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

2. SPECIFIC AFFIRMATIVE ACTION STEPS:

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

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

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

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

3. NON - DISCRIMINATION:

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

4. COMPLIANCE AND ENFORCEMENT:

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

A. 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 Division of Small Business Opportunity 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.

B. 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.

C. GENERAL REQUIREMENTS:

Contractors are responsible for informing their subcontractors in writing regardless of tier, as to their respective obligations. Whenever a Contractor subcontracts a portion of work in any trade covered by these Bid Conditions, it shall include these Bid Conditions in such subcontracts and each subcontractor shall be bound by these Bid Conditions to the full extent as if it were the prime contractor. The Contractor shall not, however, be held accountable for the failure of its subcontractors to fulfill their obligations under these Bid Conditions. However, the prime contractor shall give notice to the Director of any refusal or failure of any subcontractor to fulfill the obligations under these Bid Conditions. A subcontractor's failure to comply will be treated in the same manner as such failure by a prime contractor.

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

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

**FEDERAL AID PROJECT NO. SHE R600-391
CITY OF DENVER CONTRACT NO. 201207522**

SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

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

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

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

WITNESSETH, Commencing on **August 29, 2012**, 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>FEDERAL AID PROJECT NO. SHE R600-391</p> <p>CITY OF DENVER CONTRACT NO. 201207522</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
Bid Bond
Addenda (as applicable)
DBE Documents
Equal Employment Opportunity Provisions (Appendices A, B, E and F)
Bid Form
Commitment to DBE Participation
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 **300 (Three Hundred Days)** consecutive calendar days from the effective date of said Notice, plus such extension or extensions of time as may be granted in accordance with the provisions of the General Contract Conditions and any applicable Special Contract Conditions.

4. TERMS OF PAYMENT

The City agrees to pay the Contractor for the performance of all of the Work required under this Contract, and the Contractor agrees to accept as the Contractor's full and only compensation therefore, such sum or sums of money as may be proper in accordance with the price or prices set forth in the Contractor's Bid Form hereto attached and made a part hereof for **bid item numbers 202-00019 to 700-70592 (Eighty Seven [87] total bid items), the total estimated cost thereof being One Million Five Hundred Eight Thousand Three Hundred Eighty Four Dollars and No Cents (\$1,508,384.00)**. Adjustments to said Contract Amount and payment of amounts due hereunder shall be made in accordance with the provisions of the General Contract Conditions and any applicable Special Contract Conditions.

5. NO DISCRIMINATION IN EMPLOYMENT

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

6. DBE AND EQUAL OPPORTUNITY REQUIREMENTS

The Contractor agrees to comply with all requirements of the City's Equal Employment Opportunity program and the Federal Disadvantaged Business Enterprise Participation program as set out in Article III, Division 2, Chapter 28 of the Denver Revised Municipal Code, and any rules, regulations and guidelines set forth thereunder for such programs. This compliance shall include the obligation to maintain throughout the term of the contract that level of DBE participation upon which the Contract was initially awarded, unless otherwise authorized by the law or any rules, regulations or guidelines.

7. WAGE RATE REQUIREMENTS

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

8. APPLICABILITY OF LAWS

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

9. APPROPRIATION

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

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

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

10. APPROVALS

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

11. ASSIGNMENT

The Contractor shall not assign any of its rights, benefits, obligations or duties under this Contract except upon the prior written consent and approval of the Manager City 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. The Contractor expressly agrees that this dispute resolution process is the only dispute resolution mechanism that will be recognized by the parties for any claims put forward by the Contractor, notwithstanding any other claimed theory of entitlement on the part of the Contractor or its subcontractors or suppliers.

13. CONTRACT BINDING

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

14. PARAGRAPH HEADINGS

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

15. SEVERABILITY

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

16. ELECTRONIC SIGNATURES AND ELECTRONIC RECORDS:

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

Contract Control Number:

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

SEAL

CITY AND COUNTY OF DENVER

ATTEST:

By _____

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

By _____

By _____

By _____



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

Contract Control Number: 201207522

Vendor Name: Sturgeon Electric Company, Inc.

By: Jeff Waneka

Name: Jeff Waneka,
(please print)

Title: Vice President
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

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

Construction Contract General Conditions

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CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

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) ****General Contract Conditions 1801 and 1802 concerning warranties and guarantees are hereby deleted in their entirety****

Transportation Standards and Details for the Engineering Division

City and County of Denver Traffic Standard Drawings

Wastewater Management Division

– *Standard Detail Drawings*

– *Storm Drainage and Sanitary Sewer Construction Detail and Technical Specifications*

Colorado Department of Transportation:

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

Federal Highway Administration:

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

Building & Fire Codes:

Building Code of the City and County of Denver
(International Building Code 2006 Series, City and County of Denver Amendments 2006)

National Fire Protection Association Standards

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

The aforementioned City and County of Denver documents are available for review at the Capital Projects Management Office, 201 W. Colfax Ave., Dept. 506, (5th floor), Denver, CO 80202. The *Standard Specifications for Construction, GENERAL CONTRACT CONDITIONS* is available at http://www.denvergov.org/dpw_contract_admin/ContractAdministration/ContractorReferenceDocuments/tabid/440535/Default.aspx. *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 ENGINEERING DIVISION / CITY ENGINEER

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

SC-3 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 (the “Director”) 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 Director the authority necessary to undertake those responsibilities under this Contract. The Director shall have supervisory responsibility over the Project Manager. Additionally, Contractor questions concerning the Plans and Technical Specifications shall be directed to:

Denver Department of Public Works /Engineering Division,

<u>Project Manager</u>	<u>Telephone</u>
City Project Manager	
John Yu	(720) 865-3176

<u>Consultant</u>	<u>Name</u>	<u>Telephone</u>
Design Consultant	Consultant Contact	
Centennial Engineering		(720) 279-7244

SC-4 LIQUIDATED DAMAGES

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

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

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

SC-5 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-6 RESERVED

SC-7 PAYMENTS TO CONTRACTORS

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

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

<u>Agency/Firm</u>	<u>Name</u>	<u>Telephone</u>
Public Works/Engineering Division	John Yu	(720) 865-3176

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.

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

SC-8 CONSTRUCTION INSPECTION BY THE CITY

General Condition 1701, AUTHORITY OF INSPECTORS, 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-9 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-10 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-11 TERMINOLOGY

Terminology used in Colorado Department of Transportation (CDOT) Standards and Specifications and City and County of Denver (CCD) Standards and Specifications may differ but shall be considered interchangeable where appropriate. Examples are Department of Public Works (CCD) and Department (CDOT), Project Manager (CCD) and Engineer (CDOT), Traffic Maintenance Plan (CCD) and Traffic Control Plan (CDOT).

SC-12 TECHNICAL SPECIFICATIONS

Section 106 of the CDOT Standard Specifications is hereby incorporated into this contract except where conflicts exist between Section 106 and the General Contract Conditions or Special Contract Conditions. Where conflicts exist, the General Contract Conditions or Special Contract Conditions shall govern.

SC-13 MODIFICATION TO GENERAL CONTRACT CONDITION 405

General Contract Condition 405 is hereby revised for this project as follows:

G.C. 405.2 shall include the following:

Shop Drawings shall be submitted in accordance with Section 105.02 of the CDOT Standard Specifications. Any work performed by the Contractor prior to receipt of approved shop drawings is at the sole risk of the Contractor.

SC-14 MODIFICATION TO GENERAL CONTRACT CONDITION 809

General Contract Condition 809 is hereby revised for this project as follows:

Add G.C. 809.3 as follows:

.3 Fossils may be uncovered during excavation for the project. The Colorado Department of Transportation will furnish a paleontologist to monitor project excavations. The Contractor shall notify the Engineer at least five working days prior to the start of excavation operations to allow for scheduling of the monitor. The paleontologist, Mr. Steve Wallace, can be contacted at (303) 757-9632.

If fossils are encountered, they will be evaluated and, if deemed important, removed prior to further excavation. When directed, the Contractor shall excavate the site in such manner as to preserve the fossils uncovered and shall remove them as directed by the Engineer.

SC-15 FEDERAL REQUIREMENTS

This Project is funded, in whole or in part, by federal funding made available through the Federal Highway Administration (“FHWA”) and administered by the Colorado Department of Transportation (“CDOT”). As such, performance under this contract is subject to certain “Federal Requirements” contained or referenced in Attachment A to this contract, attached hereto and incorporated herein by this reference. The Contractor shall thoroughly review and shall strictly comply with all Federal Requirements in performing its Work under this contract.

SC-16 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-17 CONTRACT FORMS

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

- 1. Performance and Payment Bond
- 2. Performance and Payment Bond Surety Authorization Letter (Sample)

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

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

SC 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 and Auto Liability, Contractor and subcontractor's insurer(s) shall name the City and County of Denver, its elected and appointed officials, employees and volunteers as additional insured.

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

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

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

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

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

(9) **Additional Provisions:**

- (a) For Commercial General Liability, the policies must provide the following:
 - (i) That this Agreement is an Insured Contract under the policy;
 - (ii) Defense costs in excess of policy limits;
 - (iii) A severability of interests or separation of insureds provision (no insured vs. insured exclusion); and

- (iv) A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City.
- (b) For claims-made coverage:
 - (i) The retroactive date must be on or before the contract date or the first date when any goods or services were provided to the City, whichever is earlier
- (c) Contractor shall advise the City in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limits. At their own expense, and where such general aggregate or other aggregate limits have been reduced below the required per occurrence limit, the Contractor will procure such per occurrence limits and furnish a new certificate of insurance showing such coverage is in force.

SC-19 GREENPRINT DENVER REQUIREMENTS

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

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

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

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CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

PERFORMANCE AND PAYMENT BOND Bond No. 014062566

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned Sturgeon Electric Company, Inc., 12150 E. 112th Avenue, Henderson, CO 80640 a corporation organized and existing under and by virtue of the laws of the State of CO, 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 One Million Five Hundred Eight Thousand Three Hundred Eighty Four Dollars and No Cents (\$1,508,384.00), 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. 201207522, FEDERAL PROJECT NO: SHE R600-391, SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE**, 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;

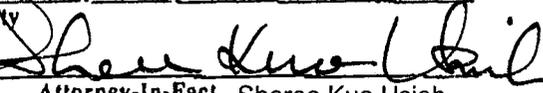
PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to contracts with others in connection with this project, or the work to be performed thereunder, or the Technical Specifications 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
11th day of December, 2012

Sturgeon Electric Company, Inc.
Contractor

By: 
Vice President, Jeff Waneka

Liberty Mutual Insurance Company
Surety

By: 
Attorney-In-Fact Sheree Kuo Hsieh

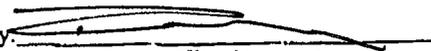
Attest:

Asst. Secretary

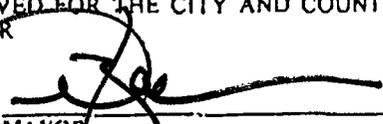


(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond).

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

By: 
Assistant City Attorney

APPROVED FOR THE CITY AND COUNTY OF
DENVER

By: 
MAYOR
By: 
MANAGER OF PUBLIC WORKS

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.

LIBERTY MUTUAL INSURANCE COMPANY
BOSTON, MASSACHUSETTS
POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS: That Liberty Mutual Insurance Company (the "Company"), a Massachusetts stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint MICHAEL M. BILL, MICHAEL H. BILL, EDWARD L. MOURNIGHAN, CYNTHIA L. JENKINS, GINGER J. KRAHN, SHEREE KUO HSIEH, BRENDA JOHNSTON, CINDY STELLHORN, LAURAN REYNOLDS, ALL OF THE CITY OF INDIANAPOLIS, STATE OF INDIANA.....

each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed; any and all undertakings, bonds, recognizances and other surety obligations in the penal sum not exceeding FOUR HUNDRED MILLION AND 00/100..... DOLLARS (\$ 400,000,000.00.....) each, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

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.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article XIII, Section 5 of the By-Laws, David M. Carey, Assistant Secretary of Liberty Mutual Insurance Company, is hereby authorized to 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.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Liberty Mutual Insurance Company has been affixed thereto in Plymouth Meeting, Pennsylvania this day of 12th day of October 2011



LIBERTY MUTUAL INSURANCE COMPANY

By David M. Carey, Assistant Secretary

COMMONWEALTH OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 12th day of October, 2011, before me, a Notary Public, personally came David M. Carey, to me known, and acknowledged that he is an Assistant Secretary of Liberty Mutual Insurance Company; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Liberty Mutual Insurance Company thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires Mar. 28, 2013
Member, Pennsylvania Association of Notaries

By Teresa Pastella, Notary Public

CERTIFICATE

I, the undersigned, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article XIII, Section 5 of the By-laws of Liberty Mutual Insurance Company.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Liberty Mutual Insurance Company at a meeting duly called and held on the 12th day of March, 1980.

VOTED that the 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.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said company, this 11th day of December, 2012



By Gregory W. Davenport, Assistant Secretary

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 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
01/25/2013

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

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

PRODUCER Arthur J. Gallagher Risk Management Services, Inc. 300 South Riverside Plaza Suite 1900 Chicago, IL 60606 Kate Ackert	1-312-704-0100	CONTACT NAME: Kate Ackert PHONE (A/C, No. Ext): 630-694-5167 E-MAIL ADDRESS: kate_ackert@ajg.com	FAX (A/C, No): 630-285-3922
INSURED Sturgeon Electric Company, Inc. 12150 E. 112th Avenue Henderson, CO 80640		INSURER(S) AFFORDING COVERAGE	
		INSURER A: Zurich American Ins Co (A XV)	NAIC # 16535
		INSURER B: AXIS SURPLUS INS CO (A XV)	26620
		INSURER C: IRONSHORE SPECIALTY INS CO (A- XIII)	25445
		INSURER D:	
		INSURER E:	
		INSURER F:	

COVERAGES

CERTIFICATE NUMBER: 31724223

REVISION NUMBER:

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

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <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			GLO837415418	09/30/12	09/30/13	EACH OCCURRENCE	\$ 2,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 100,000
							MED EXP (Any one person)	\$ 10,000
							PERSONAL & ADV INJURY	\$ 2,000,000
							GENERAL AGGREGATE	\$ 4,000,000
							PRODUCTS - COMP/OP AGG	\$ 4,000,000
								\$
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> Comp Ded <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input checked="" type="checkbox"/> Coll Ded			BAP837415516	09/30/12	09/30/13	COMBINED SINGLE LIMIT (Ea accident)	\$ 2,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
								\$
B	UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 0			EAU769572012012	09/30/12	09/30/13	EACH OCCURRENCE	\$ 5,000,000
							AGGREGATE	\$ 5,000,000
								\$
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	WC837415216 (A/O/S) WC837415316 (WI)	09/30/12 09/30/12	09/30/13 09/30/13	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER	
			N/A				E.L. EACH ACCIDENT	\$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	\$ 1,000,000
C	Excess Liability			001466200	09/30/12	09/30/13	\$5M xs \$5M	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Description of Job: 841309 SHE 2011 Pkg 2 Traffic Signal Upgrade-City of Denver Contract No 201207522
The City and County of Denver, its elected and appointed officials, employees and volunteers are shown as additional insured solely with respect to general liability and automobile liability.

CERTIFICATE HOLDER**CANCELLATION**

1556 City & County of Denver 201 West Colfax Ave Denver, CO 80202 USA	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Michael R. Peuch</i>
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ACORD 25 (2010/05)

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joamancl

31724223



Department of Public Works
Engineering Department

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

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

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

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

RE: (Company name)

Contract No: **201207522**
Federal Project No. **SHE R600-391**
Project Name: **SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE**
Contract Amount:
Performance and Payment Bond No.:

Dear Assistant City Attorney,

The Performance and Payment Bonds covering the above captioned project were executed by this agency, through _____ insurance company, on _____, 200__.

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

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

Thank you.

Sincerely,





DENVER
THE MILE HIGH CITY

Department of Public Works
Engineering Department

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

NOTICE OF APPARENT LOW BIDDER
(SAMPLE)

Date

To:

Gentlemen:

The MANAGER OF PUBLIC WORKS has considered the Bids submitted on September 21, 2012 for work to be done and materials to be furnished in and for:

PROJECT No. 201207522 SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

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

It will be necessary for you to appear forthwith at the office of the Department of Public Works, Finance and Administration, 201 W. Colfax Ave., Dept 506, Denver, Colorado 80202, to receive the said Contract Documents, execute the same and return them to the Department of Public Works, Engineering Division, Project Management Office within the time limit set forth in the Bid Proposal.

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

- a. One original plus four copies of the Power of Attorney relative to Performance and/or Payment Bond; and,
- b. One copy of listing of subcontractors showing items of work each sub-contractor will perform and the percent of total work.
- c. Accurate ACORD Certificate of Insurance

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

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



NOTICE OF APPARENT LOW BIDDER

(SAMPLE)

PROJECT NO. 201207522

Page 2

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

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

CITY AND COUNTY OF DENVER

By _____
Manager of Public Works



Department of Public Works
Engineering Department

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

Current Date

(S A M P L E)

Name
Company
Street
City/State/Zip

**FEDERAL AID PROJECT NO. SHE R600-391
CITY OF DENVER CONTRACT NO. 201207522, SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE**

NOTICE TO PROCEED

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 **201207522 SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE** with the work of constructing contract number, as set forth in detail in the contract documents for the City and County of Denver.

With a contract time of 300 (Three Hundred Days) 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.

Very truly yours,

Lesley B. Thomas
City Engineer

By:



**DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION**

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

(CITY PROJECT NAME AND NUMBER)

(NAME OF CONTRACTOR)

(NAME OF SUBCONTRACTOR/SUPPLIER)

Date: _____, 20__.

Subcontract #: _____.

Subcontract Value: \$ _____.

Last Progress Payment: \$ _____.

Date: _____.

Total Paid to Date: \$ _____.

Date of Last Work: _____.

Check Applicable Box:
[] DBE

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 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) s.
CITY OF _____)

(Name of Subcontractor)

Signed and sworn before me this
day of _____, 20__.

By: _____

Notary Public/Commissioner of Oaths
My Commission Expires

Title: _____



Instructions for Completing the Contractor/Consultant Certification of Payment Form

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

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

If you reproduce this form, you must continue to list each of the originally listed firms, as well as any additional firms used during the performance period of the contract.

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

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

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

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

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

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

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

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

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

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

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

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

COMP-REF-031

Rev 032211 JG



DENVER
THE MILE HIGH CITY

Department of Public Works
Engineering Department

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

Date

Name

Company

Street

City/State/Zip

(SAMPLE)

RE: Certificate of Contract Release for
FEDERAL AID PROJECT NO. **SHE R600-391**

CITY OF DENVER CONTRACT NO. 201207522, SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

Certificate of Contract Release

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

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

Contractor's Signature

Date Signed

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



Required Contract Provisions Federal-Aid Construction Contracts

- I. [General](#)
- II. [Nondiscrimination](#)
- III. [Nonsegregated Facilities](#)
- IV. [Payment of Predetermined Minimum Wage](#)
- V. [Statements and Payrolls](#)
- VI. [Record of Materials, Supplies, and Labor](#)
- VII. [Subletting or Assigning the Contract](#)
- VIII. [Safety: Accident Prevention](#)
- IX. [False Statements Concerning Highway Projects](#)
- X. [Implementation of Clean Air Act and Federal Water Pollution Control Act](#)
- XI. [Certification Regarding Debarment, Suspension Ineligibility, and Voluntary Exclusion](#)
- XII. [Certification Regarding Use of Contract Funds for Lobbying](#)

Attachments

- A. [Employment Preference for Appalachian Contracts \(included in Appalachian contracts only\)](#)

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:
 - Section I, paragraph 2;
 - Section IV, paragraphs 1, 2, 3, 4, and 7;
 - Section V, paragraphs 1 and 2a through 2g.
5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
 - a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
 - b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: 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, preapprenticeship, and/or on-the-job training."
2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
 - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
 - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
 - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such

advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

- a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
- b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
- c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

- c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
 - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
- 7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
 - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
 - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
 - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that 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 employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.
- 8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
 - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
 - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.
- 9. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three

years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

- a. The records kept by the contractor shall document the following:
 1. The number of minority and non-minority group members and women employed in each work classification on the project;
 2. The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 3. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 4. The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
- b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).
- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - 1. the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - 2. the additional classification is utilized in the area by the construction industry;
 - 3. the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - 4. with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and

Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

- a. Apprentices:
 - 1. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
 - 2. The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the

classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

3. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.
4. In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

1. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
2. The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
3. Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
4. In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be

permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. **Helpers:**

1. Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on

account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.
- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

1. that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 2. that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 3. that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
 - f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
 - g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
 - c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this

clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

**Certification Regarding Debarment, Suspension, Ineligibility
and Voluntary Exclusion--Lower Tier Covered Transactions:**

- 1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- 2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

- 1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

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United States Department of Transportation - Federal Highway Administration – Infrastructure

CITY AND COUNTY OF DENVER

STATE OF COLORADO



PREVAILING WAGE RATES U.S. DEPT. OF LABOR

Contract No. 201207522

**SHE 2011 PKG 2 - TRAFFIC SIGNAL
UPGRADE**

August 29, 2012

August 10, 2012

**U.S. DEPT. OF LABOR,
DAVIS BACON MINIMUM WAGES, COLORADO
GENERAL DECISION NUMBERS
CO100016, CO100017, CO100018, CO100019, CO100020,
CO100021, CO100022, CO100023 and CO100024
HIGHWAY CONSTRUCTION**

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions, unless such use is first approved by the Standards and Specification Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use this standard special provision on all federal-aid projects with contracts exceeding \$2000, except for non-ARRA projects on roadways classified as local roads or rural minor collectors, which are exempt. Projects on local roads, rural minor collectors, and enhancement projects funded with ARRA funds are not exempt.

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.		Modifications			ID
		MOD Number	Date	Page Number(s)	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
General Decision No. CO100016 applies to the following counties: Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, and Park counties.					
General Decision No. CO100016 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
	ELECTRICIAN (Traffic Signalization Only):				
1000	Clear Creek	26.42	4.75% + 8.68		
	POWER EQUIPMENT OPERATOR:				
	Drill Rig Caisson				
1001	Smaller than Watson 2500 and similar	24.27	8.62	4	
1002	Watson 2500 similar or larger	24.57	8.62	4	
	Crane (50 tons and under)				
1003	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	24.42	8.62	4	
	Crane (51 - 90 tons)				
1004	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	24.57	8.62	4	
	Crane (91 - 140 tons)				
1005	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	24.72	8.62	4	
1006	Scraper				
1007	Single bowl under 40 cubic yards	24.42	8.62	4	
1008	40 cubic yards and over	24.57	8.62	4	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
	CARPENTER:			
	Excludes Form Work			
1009	Adams	16.61	3.88	
1010	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	19.27	5.08	
	Form Work Only			
1011	Adams	16.78	3.57	
1012	Broomfield, Clear Creek, Elbert, Gilpin	19.11	5.46	
1013	Jefferson	16.88	3.81	
1014	Park	17.28	5.38	
	CEMENT MASON/CONCRETE FINISHER:			
1015	Adams	16.05	3.00	
1016	Arapahoe	18.70	3.85	
1017	Broomfield, Clear Creek, Elbert, Gilpin	18.37	3.00	
1018	Jefferson	18.02	3.42	
1019	Park	17.09	2.85	
	ELECTRICIAN:			
	Excludes Traffic Signal Installation			
1020	Adams	31.00	14.01	
1021	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	35.13	6.83	
	Traffic Signalization Electrician			
1022	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	27.25	7.10	
1023	Jefferson	26.78	5.44	
	Traffic Signalization Groundsman			
1024	Adams	13.96	2.80	
1025	Arapahoe, Broomfield, Elbert, Gilpin, Park	15.24	3.81	
1026	Clear Creek	15.70	2.14	
1027	Jefferson	15.19	4.72	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
1028	FENCE ERECTOR	13.02	3.20	
1029	FORM WORKER – Arapahoe	15.30	3.90	
	GUARDRAIL INSTALLER:			
1030	Adams	12.89	3.45	
1031	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	12.89	3.20	
	HIGHWAY/PARKING LOT STRIPING:			
	Painter			
1032	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	12.62	3.21	
1033	Jefferson	14.21	3.21	
	IRONWORKER:			
	Reinforcing			
1034	Adams	22.14	0.77	
1035	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	16.69	5.45	
1036	Park	19.98	2.89	
1037	Structural	18.22	6.01	
	LABORER:			
	Asphalt Raker			
1038	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	16.29	4.25	
1039	Park	17.41	1.86	
1040	Asphalt Shoveler	21.21	4.25	
1041	Asphalt Spreader	18.58	4.65	
	Common or General			
1042	Adams	16.29	4.25	
1043	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	16.67	4.27	
1044	Jefferson	16.51	4.27	
1045	Park	15.64	2.46	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	Concrete Saw (Hand Held)			
1046	Adams	16.29	5.20	
1047	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	16.29	6.14	
	Landscape and Irrigation			
1048	Adams, Arapahoe, Broomfield, Elbert, Gilpin, Jefferson, Park	12.26	3.16	
1049	Clear Creek	14.98	3.16	
	Mason Tender - Cement/Concrete			
1050	Adams	17.71	2.83	
1051	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	16.96	4.04	
1052	Jefferson	16.29	4.25	
1053	Park	15.08	3.10	
1054	Pipelayer	13.55	2.41	
	Traffic Control (Flagger)			
1055	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	9.55	3.05	
1056	Jefferson	9.73	3.05	
1057	Park	9.42	3.21	
	Traffic Control (Sets Up/Moves Barrels, Cones, Install Signs, Arrow Boards and Place Stationary Flags)			
1058	Adams, Arapahoe, Broomfield, Elbert, Gilpin, Jefferson	12.43	3.22	
1059	Clear Creek	13.14	3.20	
1060	Park	12.76	3.20	
1061	PAINTER (Spray Only)	16.99	2.87	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR:			
	Asphalt Laydown			
1062	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	22.67	8.75	
1063	Park	22.67	8.72	
1064	Asphalt Paver	24.97	6.13	
	Asphalt Roller			
1065	Adams	24.20	7.70	
1066	Arapahoe	22.68	8.72	
1067	Broomfield, Clear Creek, Elbert, Gilpin	23.41	7.67	
1068	Jefferson	22.84	7.69	
1069	Park	22.84	8.72	
	Asphalt Spreader			
1070	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	22.67	8.67	
1071	Jefferson	23.34	8.06	
1072	Backhoe/Trackhoe			
1073	Adams	20.31	4.24	
1074	Arapahoe	24.59	6.24	
1075	Broomfield, Clear Creek, Elbert, Gilpin	22.19	6.48	
1076	Jefferson	21.99	5.60	
1077	Park	20.81	6.58	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Bobcat/Skid Loader			
1078	Adams, Broomfield, Clear Creek, Elbert, Gilpin	15.37	4.28	
1079	Arapahoe	18.23	4.28	
1080	Jefferson	16.85	4.28	
1081	Park	22.46	0.00	
1082	Boom	22.67	8.72	
	Broom/Sweeper			
1083	Adams, Broomfield, Clear Creek, Elbert, Gilpin, Park	22.70	8.07	
1084	Arapahoe	22.67	8.73	
1085	Jefferson	22.18	8.36	
	Bulldozer			
1086	Adams	25.20	6.72	
1087	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	26.90	5.59	
1088	Concrete Pump	21.60	5.21	
	Crane			
1089	Adams, Park	22.82	8.72	
1090	Jefferson	23.55	6.68	
	Drill			
1091	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	20.48	4.71	
1092	Jefferson	20.65	5.74	
1093	Forklift	15.91	4.68	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Grader/Blade			
1094	Adams	23.94	8.23	
1095	Arapahoe	22.67	8.72	
1096	Broomfield, Clear Creek, Elbert, Gilpin, Park	23.90	7.93	
1097	Jefferson	23.28	7.73	
1098	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1099	Adams	23.09	8.72	
1100	Arapahoe	26.80	4.84	
1101	Broomfield, Clear Creek, Elbert, Gilpin	23.20	8.33	
1102	Jefferson	23.06	7.76	
1103	Park	22.67	8.72	
	Mechanic			
1104	Adams	22.82	8.72	
1105	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	24.04	7.35	
1106	Jefferson	23.56	8.72	
	Oiler			
1107	Adams, Jefferson	21.97	8.72	
1108	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	23.73	8.41	
	Roller/Compactor (Dirt and Grade Compaction)			
1109	Adams	16.70	3.30	
1110	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	20.30	5.51	
1111	Park	16.52	3.13	
1112	Rotomill	16.22	4.41	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Screed			
1113	Adams	27.89	3.50	
1114	Arapahoe	22.67	8.72	
1115	Broomfield, Clear Creek, Elbert, Gilpin	24.67	6.02	
1116	Jefferson	22.64	8.43	
1117	Park	20.36	3.04	
1118	Tractor	13.13	2.95	
	TRUCK DRIVER:			
	Distributor			
1119	Adams	15.80	5.27	
1120	Arapahoe	19.62	5.27	
1812	Broomfield, Clear Creek, Elbert, Gilpin, Park	18.19	5.27	3
1121	Jefferson	19.46	6.04	
	Dump Truck			
1122	Adams	16.68	5.27	
1123	Arapahoe	18.94	5.27	
1124	Broomfield, Clear Creek, Elbert, Gilpin	16.47	5.27	
1125	Jefferson	16.97	4.78	
1126	Park	15.40	3.21	
	Lowboy Truck			
1127	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	17.25	5.27	
1128	Jefferson	19.80	6.42	
1129	Mechanic	26.48	3.50	
	Multi-Purpose Speciality and Hoisting Truck			
1130	Adams, Broomfield, Clear Creek, Elbert, Gilpin, Park	17.49	3.17	
1131	Arapahoe	15.79	2.48	
1132	Jefferson	15.13	3.89	

General Decision No. CO100016				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER (con't.):			
	Semi/Trailer Truck (Includes Pickup and Pilot Car)			
1133	Adams, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	18.39	4.13	
1134	Arapahoe	16.00	2.60	
	Single Axle (Includes Pickup and Pilot Car)			
1135	Adams, Jefferson	13.93	3.68	
1136	Arapahoe	15.10	3.77	
1137	Broomfield, Clear Creek, Elbert, Gilpin, Park	14.74	3.68	
1138	Truck Mounted Attenuator	12.43	3.22	
	Water Truck			
1139	Adams	17.50	5.19	
1140	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	19.36	4.07	
1141	Jefferson	17.57	5.27	

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

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

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

END OF GENERAL DECISION NO. CO100016

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.		Modifications			ID
		MOD Number	Date	Page Number(s)	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
General Decision No. CO100017 applies to the following counties: Boulder county.					
General Decision No. CO100017 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
	POWER EQUIPMENT OPERATOR:				
	Drill Rig Caisson				
1142	Smaller than Watson 2500 and similar	24.27	8.62	4	
1143	Watson 2500 similar or larger	24.57	8.62	4	
	Crane				
1144	50 tons and under	24.42	8.62	4	
1145	51 - 90 tons	24.57	8.62	4	
1146	91 - 140 tons	24.72	8.62	4	
	Scraper				
1147	Single bowl under 40 cubic yards	24.42	8.62	4	
1148	40 cubic yards and over	24.57	8.62	4	
	CARPENTER:				
1149	Excludes Form Work	16.61	3.88		
1150	Form Work Only	17.06	3.90		
1151	CEMENT MASON/CONCRETE FINISHER	17.39	3.00		
1152	ELECTRICIAN	33.39	7.64		
1153	FENCE ERECTOR	15.96	3.46		
1154	GUARDRAIL INSTALLER	16.21	3.63		
1155	HIGHWAY/PARKING LOT STRIPING:				
1156	Painter	12.62	3.21		

General Decision No. CO100017				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	IRONWORKER:			
1157	Reinforcing (Excludes Guardrail Installation)	16.69	5.45	
1158	Structural (Excludes Guardrail Installation)	18.22	6.01	
	LABORER:			
1159	Asphalt Raker	16.29	4.25	
1160	Asphalt Shoveler	21.21	4.25	
1161	Asphalt Spreader	18.58	4.65	
1162	Common or General	16.29	4.25	
1163	Concrete Saw (Hand Held)	16.29	6.14	
1164	Landscape and Irrigation	12.26	3.16	
1165	Mason Tender - Cement/Concrete	16.29	4.25	
1166	Pipelayer	16.74	1.89	
1167	Traffic Control (Flagger)	9.55	3.05	
1168	Traffic Control (Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags), (Excludes Flaggers)	12.43	3.22	
1169	PAINTER (Spray Only)	16.99	2.87	
	POWER EQUIPMENT OPERATOR:			
1170	Asphalt Laydown	22.67	8.25	
1171	Asphalt Paver	24.19	6.58	
1172	Asphalt Roller	23.01	9.22	
1173	Asphalt Spreader	22.67	8.72	
1174	Backhoe/Trackhoe	21.70	5.51	
1175	Bobcat/Skid Loader	15.37	4.28	
1176	Boom	22.67	8.72	
1177	Broom/Sweeper	22.83	8.72	
1178	Bulldozer	26.90	5.59	
1179	Drill	21.42	2.88	

General Decision No. CO100017				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
1180	Forklift	15.91	4.27	
1181	Grader/Blade	22.67	8.72	
1182	Guardrail/Post Driver	16.54	4.10	
1183	Loader (Front End)	22.67	8.72	
1184	Mechanic			
1185	Oiler	22.77	9.22	
1186	Roller/Compactor (Dirt and Grade Compaction)	22.32	8.72	
1187	Rotomill	16.22	4.41	
1188	Screed	22.67	8.72	
1189	Tractor	13.13	2.95	
	TRAFFIC SIGNALIZATION:			
1190	Groundsman	18.52	3.59	
	TRUCK DRIVER:			
1191	Distributor	21.69	5.27	
1192	Dump Truck	16.41	5.27	
1193	Lowboy Truck	17.25	5.27	
1194	Multi-Purpose Specialty & Hoisting Truck	16.41	4.97	
1195	Pickup and Pilot Car	13.93	3.68	
1196	Semi/Trailer Truck	18.39	4.13	
1197	Truck Mounted Attenuator	12.43	3.22	
1198	Water Truck	20.64	5.27	

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

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

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

END OF GENERAL DECISION NO. CO100017

<p>Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.</p> <p>When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.</p>	Modifications			ID
	MOD Number	Date	Page Number(s)	
	1	11-18-11	14	1
	2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
	3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4	
General Decision No. CO100018 applies to the following counties: El Paso, Pueblo, and Teller counties.				

General Decision No. CO100018
The wage and fringe benefits listed below reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	ELECTRICIAN:			
1199	El Paso, Teller	28.55	14.46	
1200	Pueblo	26.75	11.90	1
	POWER EQUIPMENT OPERATOR:			
	Drill Rig Caisson			
1201	Smaller than Watson 2500 and similar	24.27	8.62	4
1202	Watson 2500 similar or larger	24.57	8.62	4
	Crane			
1203	50 tons and under	24.42	8.62	4
1204	51 - 90 tons	24.57	8.62	4
1205	91 - 140 tons	24.72	8.62	4

General Decision No. CO100018
The wage and fringe benefits listed below do not reflect collectively bargained rates.

	CARPENTER:			
1206	Excludes Form Work	24.15	6.25	
	Form Work Only			
1207	El Paso, Teller	19.06	5.84	
1208	Pueblo	19.00	5.88	
	CEMENT MASON/CONCRETE FINISHER:			
1209	El Paso, Teller	17.36	3.00	
1210	Pueblo	17.74	3.00	
1211	FENCE ERECTOR	13.02	3.20	
1212	GUARDRAIL INSTALLER	12.89	3.20	

General Decision No. CO100018				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	HIGHWAY/PARKING LOT STRIPING:			
1213	Painter	12.62	3.21	
	IRONWORKER:			
	Reinforcing (Excludes Guardrail Installation)			
1214	El Paso, Teller	20.49	1.65	
1215	Pueblo	16.69	5.45	
1216	Structural (Excludes Guardrail Installation)	18.22	6.01	
	LABORER:			
1217	Asphalt Raker	17.54	3.16	
1218	Asphalt Shoveler	21.21	4.25	
1219	Asphalt Spreader	18.58	4.65	
	Common or General			
1220	El Paso	17.05	3.69	
1221	Pueblo	16.29	4.25	
1222	Teller	16.88	3.61	
1223	Concrete Saw (Hand Held)	16.29	6.14	
1224	Landscape and Irrigation	12.26	3.16	
1225	Mason Tender - Cement/Concrete	16.29	4.25	
1226	Pipelayer	18.72	3.24	
1227	Traffic Control (Flagger)	9.55	3.05	
1228	Traffic Control (Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags), (Excludes Flaggers)	12.43	3.22	
1229	PAINTER (Spray Only)	16.99	2.87	

General Decision No. CO100018				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR:			
1230	Asphalt Laydown	22.67	8.72	
1231	Asphalt Paver	21.50	3.50	
	Asphalt Roller			
1232	El Paso	24.42	6.96	
1233	Pueblo	23.67	9.22	
1813	Teller	24.42	6.96	3
1234	Asphalt Spreader	22.67	8.72	
	Backhoe/Trackhoe			
1235	El Paso	23.31	5.61	
1236	Pueblo	21.82	8.22	
1237	Teller	23.32	5.50	
1238	Bobcat/Skid Loader	15.37	4.28	
1239	Boom	22.67	8.72	
	Broom/Sweeper			
1240	El Paso, Teller	23.43	8.04	
1241	Pueblo	23.47	9.22	
	Bulldozer			
1242	El Paso	26.56	7.40	
1243	Pueblo, Teller	26.11	6.92	
1244	Drill	17.59	3.45	
1245	Forklift	15.91	4.68	
	Grader/Blade			
1246	El Paso	22.83	8.72	
1247	Pueblo	23.25	6.98	
1248	Teller	23.22	8.72	
1249	Guardrail/Post Driver	16.07	4.41	

General Decision No. CO100018				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Loader (Front End)			
1250	El Paso	23.61	7.79	
1251	Pueblo	21.67	8.22	
1252	Teller	23.50	7.64	
	Mechanic			
1253	El Paso	22.35	6.36	
1254	Pueblo	24.02	8.43	
1255	Teller	22.16	6.17	
	Oiler			
1256	El Paso	23.29	7.48	
1257	Pueblo	23.13	7.01	
1258	Teller	22.68	7.11	
	Roller/Compactor (Dirt and Grade Compaction)			
1259	El Paso	16.70	3.30	
1260	Pueblo, Teller	18.43	4.62	
1261	Rotomill	16.22	4.41	
1262	Scraper	24.28	4.83	
	Screed			
1263	El Paso, Teller	25.22	5.74	
1264	Pueblo	23.67	9.22	
1265	Tractor	13.13	2.95	

General Decision No. CO100018				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER:			
	Distributor			
1266	El Paso, Teller	17.98	3.97	
1267	Pueblo	18.35	3.85	
	Dump Truck			
1268	El Paso, Teller	16.85	4.83	
1269	Pueblo	16.87	4.79	
1270	Lowboy Truck	17.25	5.27	
1271	Mechanic	26.69	3.50	
1272	Multi-Purpose Specialty & Hoisting Truck	17.27	3.71	
1273	Pickup and Pilot Car	13.93	3.68	
1274	Semi/Trailer Truck	16.00	2.60	
1275	Truck Mounted Attenuator	12.43	3.22	
	Water Truck			
1276	El Paso	17.24	4.15	
1277	Pueblo	20.93	4.98	
1278	Teller	17.31	4.07	

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

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

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

END OF GENERAL DECISION NO. CO100018

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.		Modifications			ID
		MOD Number	Date	Page Number(s)	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
General Decision No. CO100019 applies to the following counties: Denver and Douglas counties.					
General Decision No. CO100019 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
1279	CARPENTER (Form Work Only)	24.00	11.28		
	TRAFFIC SIGNALIZATION:				
	Traffic Signal Installation				
1280	Zone 1	26.42	4.75% + 8.68		
1281	Zone 2	29.42	4.75% + 8.68		
	<u>Traffic Installer Zone Definitions</u> Zone 1 – Within a 35 mile radius measured from the addresses 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 Zone 2 - All work outside these areas.				
	POWER EQUIPMENT OPERATOR:				
	Hydraulic Backhoe				
1282	Wheel Mounted, under ¾ yds.	24.27	8.62	4	
1283	Backhoe/Loader combination	24.27	8.62	4	
	Drill Rig Caisson				
1284	Smaller than Watson 2500 and similar	24.27	8.62	4	
1285	Watson 2500 similar or larger	24.57	8.62	4	
	Loader				
1286	Up to and including 6 cubic yards	24.27	8.62	4	
1287	Denver County - Under 6 cubic yards	24.27	8.62	4	
1288	Denver County - Over 6 cubic yards	24.42	8.62	4	

General Decision No. CO100019				
The wage and fringe benefits listed below reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Motor Grader			
1289	Douglas county - Blade Rough	24.27	8.62	4
1290	Douglas county - Blade Finish	24.57	8.62	4
	Crane			
1291	50 tons and under	24.42	8.62	4
1292	51 to 90 tons	24.57	8.62	4
1293	91 to 140 tons	24.72	8.62	4
	Scraper			
1294	Single bowl under 40 cubic yards	24.42	8.62	4
1295	40 cubic yards and over	24.57	8.62	4
General Decision No. CO100019				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
1296	CARPENTER (Excludes Form Work)	19.27	5.08	
	CEMENT MASON/CONCRETE FINISHER:			
1297	Denver	20.18	5.75	
1298	Douglas	18.75	3.00	
1299	ELECTRICIAN (Excludes Traffic Signal Installation)	35.13	6.83	
1300	FENCE ERECTOR (Excludes Link/Cyclone Fence Erection)	13.02	3.20	
1301	GUARDRAIL INSTALLER	12.89	3.20	
	HIGHWAY/PARKING LOT STRIPING:			
	Painter			
1302	Denver	12.62	3.21	
1303	Douglas	13.89	3.21	
	IRONWORKERS:			
1304	Reinforcing (Excludes Guardrail Installation)	16.69	5.45	
1305	Structural (Includes Link/Cyclone Fence Erection), (Excludes Guardrail Installation)	18.22	6.01	

General Decision No. CO100019				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	LABORERS:			
1306	Asphalt Raker	16.29	4.25	
1307	Asphalt Shoveler	21.21	4.25	
1308	Asphalt Spreader	18.58	4.65	
	Common or General			
1309	Denver	16.76	6.77	
1310	Douglas	16.29	4.25	
1311	Concrete Saw (Hand Held)	16.29	6.14	
1312	Landscape and Irrigation	12.26	3.16	
	Mason Tender - Cement/Concrete			
1313	Denver	16.96	4.04	
1314	Douglas	16.29	4.25	
	Pipelayer			
1315	Denver	13.55	2.41	
1316	Douglas	16.30	2.18	
	Traffic Control			
1317	Flagger	9.55	3.05	
1318	Sets Up/Moves Barrels, Cones, Install Signs, Arrow Boards and Place Stationary Flags, (Excludes Flaggers)	12.43	3.22	
	PAINTER:			
1319	Spray Only	16.99	2.87	
	POWER EQUIPMENT OPERATOR:			
	Asphalt Laydown			
1320	Denver	22.67	8.72	
1321	Douglas	23.67	8.47	
	Asphalt Paver			
1322	Denver	24.97	6.13	
1323	Douglas	25.44	3.50	

General Decision No. CO100019				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Asphalt Roller			
1324	Denver	23.13	7.55	
1325	Douglas	23.63	6.43	
1326	Asphalt Spreader	22.67	8.72	
	Backhoe/Trackhoe			
1327	Douglas	23.82	6.00	
1328	Bobcat/Skid Loader	15.37	4.28	
1329	Boom	22.67	8.72	
	Broom/Sweeper			
1330	Denver	22.47	8.72	
1331	Douglas	22.96	8.22	
1332	Bulldozer	26.90	5.59	
1333	Concrete Pump	21.60	5.21	
	Drill			
1334	Denver	20.48	4.71	
1335	Douglas	20.71	2.66	
1336	Forklift	15.91	4.68	
	Grader/Blade			
1337	Denver	22.67	8.72	
1338	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1339	Douglas	21.67	8.22	
	Mechanic			
1340	Denver	22.89	8.72	
1341	Douglas	23.88	8.22	

General Decision No. CO100019				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Oiler			
1342	Denver	23.73	8.41	
1343	Douglas	24.90	7.67	
	Roller/Compactor (Dirt and Grade Compaction)			
1344	Denver	20.30	5.51	
1345	Douglas	22.78	4.86	
1346	Rotomill	16.22	4.41	
	Screed			
1347	Denver	22.67	8.38	
1348	Douglas	29.99	1.40	
1349	Tractor	13.13	2.95	
	TRAFFIC SIGNALIZATION:			
	Groundsman			
1350	Denver	17.90	3.41	
1351	Douglas	18.67	7.17	
	TRUCK DRIVER:			
	Distributor			
1352	Denver	17.81	5.82	
1353	Douglas	16.98	5.27	
	Dump Truck			
1354	Denver	15.27	5.27	
1355	Douglas	16.39	5.27	
1356	Lowboy Truck	17.25	5.27	
1357	Mechanic	26.48	3.50	
	Multi-Purpose Specialty & Hoisting Truck			
1358	Denver	17.49	3.17	
1359	Douglas	20.05	2.88	

General Decision No. CO100019				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER (con't.):			
	Pickup and Pilot Car			
1360	Denver County	14.24	3.77	
1361	Douglas County	16.43	3.68	
1362	Semi/Trailer Truck	18.39	4.13	
1363	Truck Mounted Attenuator	12.43	3.22	
	Water Truck			
1364	Denver County	26.27	5.27	
1365	Douglas County	19.46	2.58	

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

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

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

END OF GENERAL DECISION NO. CO100019

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.		Modifications			ID
		MOD Number	Date	Page Number(s)	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
General Decision No. CO100020 applies to the following counties: Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Las Animas, Otero, and Prowers counties.					
General Decision No. CO100020 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
1366	CARPENTER (Form Work Only)	24.00	11.28		
1814	ELECTRICIAN (Boom Truck Operator)	20.91	3% + 6.10	3	
	POWER EQUIPMENT OPERATOR:				
	Power Broom/Sweeper				
1367	Under 70 hp	23.57	8.62	4	
1368	70 hp and over	24.27	8.62	4	
	Drill Rig Caisson				
1369	Smaller than Watson 2500 and similar	24.27	8.62	4	
1370	Watson 2500 similar or larger	24.57	8.62	4	
	Crane				
1371	50 tons and under	24.42	8.62	4	
1372	51 - 90 tons	24.57	8.62	4	
1373	91 - 140 tons	24.72	8.62	4	
General Decision No. CO100020 The wage and fringe benefits listed below do not reflect collectively bargained rates.					
1374	CARPENTER (Excludes Form Work)	18.96	3.18		
	CEMENT MASON/CONCRETE FINISHER:				
1375	Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Otero, Prowers	17.70	2.53		
1376	Las Animas	17.24	2.85		
1377	ELECTRICIAN	28.06	8.76		
	HIGHWAY/PARKING LOT STRIPING:				
1378	Truck Driver (Line Striping Truck)	14.60	3.49		
1379	Painter	13.92	3.07		

General Decision No. CO100020				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	IRONWORKER:			
1380	Reinforcing	16.94	6.77	
1381	Structural	16.76	6.01	
	LABORER:			
	Common or General			
1382	Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Otero, Prowers	14.48	3.53	
1383	Las Animas	14.52	3.53	
1384	Concrete Saw (Hand Held)	16.00	6.14	
1385	Landscape and Irrigation	15.37	3.16	
1386	Mason Tender - Cement/Concrete	12.44	3.10	
1387	Traffic Control (Flagger)	9.42	3.21	
1388	Traffic Control (Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags), (Excludes Flaggers)	12.39	3.20	
1389	PAINTER (Spray Only)	17.54	3.52	
	POWER EQUIPMENT OPERATOR:			
1390	Asphalt Laydown	24.17	6.73	
1391	Asphalt Paver	22.67	8.72	
1392	Asphalt Plant	21.13	2.16	
1393	Asphalt Roller	23.14	7.51	
1394	Asphalt Spreader	23.19	7.66	
	Backhoe/Trackhoe			
1395	Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Otero, Prowers	23.19	4.18	
1396	Las Animas	24.70	3.40	

General Decision No. CO100020				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
1397	Bobcat/Skid Loader	18.43	3.12	
1398	Bulldozer	26.65	4.46	
1399	Chipper	22.04	8.26	
1400	Drill	20.49	2.66	
1401	Forklift	18.30	5.01	
	Grader/Blade			
1402	Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Otero, Prowers	18.40	4.20	
1403	Las Animas	18.88	3.14	
1404	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1405	Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Otero, Prowers	23.58	6.66	
1406	Las Animas	23.56	5.93	
1407	Mechanic	18.91	4.20	
1408	Oiler	22.54	9.22	
1409	Roller/Compactor (Dirt and Grade Compaction)	17.78	2.83	
1410	Scraper	19.93	5.38	
1411	Screed	16.21	3.76	
1412	Tractor	16.83	2.95	
	TRUCK DRIVER:			
1413	Distributor	17.98	5.27	
1414	Dump Truck	17.61	2.69	
	Lowboy Truck			
1415	Baca, Bent, Costilla, Crowley, Huerfano, Kiowa, Otero, Prowers	19.95	3.36	
1416	Las Animas	19.77	3.25	

General Decision No. CO100020				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER, (con't):			
1417	Mechanic	17.79	3.51	
1418	Multi-Purpose Specialty & Hoisting Truck	18.89	3.49	
1419	Pickup and Pilot Car	14.04	3.49	
1420	Semi Truck	17.58	4.67	
1421	Water Truck	14.88	2.07	

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

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

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

END OF GENERAL DECISION NO. CO100020

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.		Modifications			ID
		MOD Number	Date	Page Number(s)	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
General Decision No. CO100021 applies to the following counties: Cheyenne, Kit Carson, Lincoln, Logan, Morgan, Phillips, Sedgwick, Washington, and Yuma counties.					
General Decision No. CO100021 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
1815	ELECTRICIAN (Boom Truck Operator)	20.91	3% + 6.10	3	
	POWER EQUIPMENT OPERATOR:				
	Power Broom/Sweeper				
1422	Under 70 hp	23.57	8.62	4	
1423	70 hp and over	24.27	8.62	4	
1424	Boom	-	-		
	Drill Rig Caisson				
1425	Smaller than Watson 2500 and similar	24.27	8.62	4	
1426	Watson 2500 similar or larger	24.57	8.62	4	
	Asphalt Screed				
1427	Kit Carson	24.27	8.62	4	
	Crane				
1428	50 tons and under	24.42	8.62	4	
1429	51 - 90 tons	24.57	8.62	4	
1430	91 - 140 tons	24.72	8.62	4	
	LABORER:				
	Common or General				
1431	Kit Carson	16.05	6.89		
	TRUCK DRIVER:				
	Dump Truck				
1432	Kit Carson	-	-		

General Decision No. CO100021				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	CARPENTER:			
1433	Excludes Form Work	18.96	3.18	
	Form Work Only			
1434	Cheyenne, Kit Carson, Logan, Morgan, Phillips, Sedgwick, Washington, Yuma	20.28	4.50	
1435	Lincoln	20.98	3.89	
	CEMENT MASON/CONCRETE FINISHER:			
1436	Cheyenne, Logan, Morgan, Phillips, Sedgwick, Washington, Yuma	19.22	2.74	
1437	Kit Carson	17.98	2.53	
1438	Lincoln	21.00	1.40	
1439	ELECTRICIAN	28.06	8.76	
	HIGHWAY/PARKING LOT STRIPING:			
1440	Truck Driver (Line Striping Truck)	14.60	3.49	
1441	Painter	12.90	3.07	
1442	IRONWORKER:			
1443	Reinforcing	21.12	3.89	
1444	Structural	16.76	6.01	
	LABORER:			
	Asphalt Raker			
1445	Cheyenne, Kit Carson, Lincoln, Logan, Morgan, Phillips, Washington, Yuma	17.02	5.79	
1446	Sedgwick	15.79	4.87	
1447	Asphalt Spreader	22.67	8.72	
	Common or General			
1448	Cheyenne, Kit Carson, Lincoln, Logan, Morgan, Phillips, Sedgwick, Washington, Yuma	12.44	3.53	
1449	Concrete Saw (Hand Held)	16.00	6.14	
1450	Landscape and Irrigation	12.81	3.16	
1451	Mason Tender - Cement/Concrete	14.71	3.29	

General Decision No. CO100021				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	LABORER (con't):			
	Traffic Control			
1452	Flagger	9.42	3.21	
1453	Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags, (Excludes Flaggers)	12.39	3.20	
1454	PAINTER (Spray Only)	17.54	3.52	
	POWER EQUIPMENT OPERATOR:			
1455	Asphalt Laydown	24.56	6.68	
1456	Asphalt Paver	22.67	8.72	
1457	Asphalt Plant	21.13	2.16	
	Asphalt Roller			
1458	Cheyenne, Kit Carson, Lincoln, Logan, Morgan, Phillips, Washington, Yuma	23.79	7.59	
1459	Sedgwick	23.92	9.22	
1460	Asphalt Spreader	23.19	7.66	
	Backhoe/Trackhoe			
1461	Cheyenne, Lincoln, Logan, Morgan, Phillips, Sedgwick, Washington, Yuma	25.88	4.18	
1462	Kit Carson	28.64	1.40	
1463	Bobcat/Skid Loader	20.79	5.36	
1464	Bulldozer	29.99	2.90	
1465	Chipper	22.04	8.26	
1466	Drill	20.49	2.66	
1467	Forklift	18.30	2.01	
1468	Grader/Blade	19.02	4.20	
1469	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1470	Cheyenne, Kit Carson, Lincoln, Logan, Morgan, Phillips, Washington, Yuma	27.22	5.85	
1471	Sedgwick	27.48	4.87	

General Decision No. CO100021				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Mechanic			
1472	Cheyenne, Lincoln, Logan, Morgan, Phillips, Washington, Yuma	20.52	5.49	
1473	Kit Carson	16.74	4.20	
1474	Sedgwick	21.09	4.87	
1475	Oiler	22.54	9.22	
1476	Roller/Compactor (Dirt and Grade Compaction)	16.52	4.87	
1477	Scraper	19.93	5.38	
	Screed			
1478	Cheyenne, Kit Carson, Lincoln, Logan, Morgan, Phillips, Sedgwick, Washington, Yuma	21.30	6.40	
1479	Tractor	16.83	2.95	
	TRUCK DRIVER:			
1480	Distributor	17.98	5.27	
	Dump Truck			
1481	Cheyenne, Logan, Morgan, Phillips, Washington, Yuma	18.52	5.96	
1482	Lincoln	14.15	3.83	
1483	Sedgwick	18.92	6.19	
	Kit Carson			
1816	6 cu. yds. and under	18.55	3.87	3
1817	7 – 14 cu. yds.	18.70	3.87	3
1818	15 – 29 cu. yds.	19.04	3.87	3
1819	30 – 38 cu. yds.	19.38	3.87	3
1820	39 – 54 cu. yds.	19.66	3.87	3
1821	55 – 79 cu. yds.	19.95	3.87	3
1822	80 – 104 cu. yds.	20.22	3.87	3
1823	104 cu. yds. and over	20.51	3.87	3

General Decision No. CO100021				
The wage and fringe benefits listed below do not reflect collectively bargained rates				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER (con't.):			
1484	Lowboy Truck	18.29	4.87	
1485	Mechanic	17.79	3.51	
1486	Multi-Purpose Specialty & Hoisting Truck	18.79	3.49	
1487	Pickup and Pilot Car	14.04	3.49	
	Semi Truck			
1488	Cheyenne, Kit Carson, Lincoln, Morgan	17.58	4.67	
1489	Logan, Phillips, Sedgwick, Washington, Yuma	15.80	4.67	
1490	Water Truck	14.88	2.07	

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

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

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

END OF GENERAL DECISION NO. CO100021

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011. When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		Modifications			ID
		MOD Number	Date	Page Number(s)	
		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
	4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4	
General Decision No. CO100022 applies to the following counties: Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, La Plata, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, and San Miguel counties.					
General Decision No. CO100022 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
1491	CARPENTER (Excludes Form Work)	24.00	11.28		
1824	ELECTRICIAN (Boom Truck Operator)	20.91	6.10 + 3%	3	
	POWER EQUIPMENT OPERATOR:				
	Drill Rig Caisson				
1492	Smaller than Watson 2500 and similar	24.27	8.62	4	
1493	Watson 2500 similar or larger	24.57	8.62	4	
	Mechanic				
1494	La Plata County	24.42	8.62	4	
General Decision No. CO100022 The wage and fringe benefits listed below do not reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
	CARPENTER:				
	Form Work Only				
1495	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	18.57	5.38		
1496	La Plata	18.60	5.38		
	CEMENT MASON/CONCRETE FINISHER:				
1497	Alamosa, Archuleta, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Ouray, Rio Grande, Saguache, San Juan, San Miguel	17.67	2.85		
1498	Chaffee	15.55	2.85		
1499	La Plata	18.99	2.85		
1500	Montrose	16.95	2.85		

General Decision No. CO100022				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
1501	ELECTRICIAN	28.06	8.76	
1502	GUARDRAIL INSTALLER	12.78	3.31	
	HIGHWAY/PARKING LOT STRIPING:			
1503	Truck Driver (Line Striping Truck)	14.60	3.49	
1504	Painter	12.90	3.07	
	IRONWORKER:			
1505	Reinforcing (Excludes Guardrail Installation)	16.94	6.77	
1506	Structural (Excludes Guardrail Installation)	16.76	6.01	
	LABORER:			
	Asphalt Raker			
1507	Alamosa	17.53	3.75	
1508	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	16.43	3.42	
1509	La Plata	15.38	3.12	
	Common or General			
1510	Alamosa, Chaffee, Montezuma, Montrose	12.44	3.53	
1511	Archuleta, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Ouray, Rio Grande, Saguache, San Miguel	13.70	3.53	
1512	Fremont	15.19	3.00	
1513	La Plata	14.07	3.53	
1514	Mineral	14.84	3.53	
1515	San Juan	13.73	3.53	
1516	Concrete Saw (Hand Held)	16.00	6.14	
	Landscape and Irrigation			
1517	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	14.02	3.16	
1518	La Plata	13.54	3.16	

General Decision No. CO100022				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	LABORER (con't):			
	Mason Tender - Cement/Concrete			
1519	Alamosa, Archuleta, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	14.59	3.10	
1520	Chaffee	12.44	3.10	
1521	La Plata	15.67	3.10	
	Traffic Control			
1522	Flagger	9.42	3.21	
1523	Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags, (Excludes Flaggers)	12.39	3.20	
1524	PAINTER (Spray Only)	17.54	3.52	
	POWER EQUIPMENT OPERATOR:			
	Asphalt Laydown			
1525	Alamosa, La Plata	22.67	8.72	
1526	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	23.13	8.64	
1527	Asphalt Paver	22.67	8.72	
1528	Asphalt Plant	17.23	4.07	
	Asphalt Roller			
1529	Alamosa	21.67	8.22	
1530	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	22.77	8.36	
1531	La Plata	22.68	7.30	
1532	Montezuma	22.67	8.72	
1533	Asphalt Spreader	22.67	8.72	

General Decision No. CO100022				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Backhoe/Trackhoe			
1534	Alamosa	21.03	3.75	
1535	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	19.75	3.75	
1536	La Plata	19.79	5.13	
1537	Mineral	19.17	5.53	
1538	Montezuma	16.42	4.42	
	Bobcat/Skid Loader			
1539	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	18.20	4.54	
1540	La Plata	19.98	4.88	
1541	Mineral	17.94	4.62	
	Broom/Sweeper			
1542	Alamosa	20.67	9.22	
1543	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, La Plata, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	21.70	9.22	
	Bulldozer			
1544	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	23.28	9.22	
1545	Fremont	23.67	9.22	
1546	La Plata	23.57	8.72	
1547	Chipper	22.04	8.26	
	Crane			
1548	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	25.01	8.22	
1549	La Plata	25.21	8.22	

General Decision No. CO100022				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
1550	Drill	20.84	2.66	
1551	Forklift	18.30	5.01	
1552	Grade Checker	23.91	7.89	
	Grader/Blade			
1553	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	16.39	4.20	
1554	Fremont	19.68	3.37	
1555	La Plata	19.83	4.20	
1556	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1557	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montrose, Ouray, Rio Grande, Saguache, San Juan	23.38	8.22	
1558	Fremont	23.67	9.22	
1559	La Plata	23.36	7.09	
1560	Montezuma	22.82	8.72	
1561	San Miguel	23.82	9.22	
	Mechanic			
1562	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	16.74	4.20	
1563	Fremont	18.79	3.51	
	Oiler			
1564	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan,	22.97	7.88	
1565	Fremont	22.97	8.56	
1566	La Plata	24.08	5.49	
1567	San Miguel	22.97	9.22	

General Decision No. CO100022				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Roller/Compactor (Dirt and Grade Compaction)			
1568	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	19.24	4.96	
1569	Fremont	16.52	5.28	
1570	La Plata	18.33	2.98	
1571	Rotomill	16.28	4.41	
1572	Scraper	17.62	2.96	
	Screed			
1573	Alamosa	20.33	6.81	
1574	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	19.58	4.96	
1575	La Plata	17.86	2.75	
1576	Tractor	15.08	2.95	
	TRAFFIC SIGNALIZATION:			
1577	Groundsman	17.04	2.28	
	TRUCK DRIVER:			
	Distributor			
1578	Alamosa	18.40	4.51	
1579	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, La Plata, Mineral, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	17.62	5.27	
1580	Montezuma	15.80	5.27	

General Decision No. CO100022				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER (con't.):			
	Dump Truck			
1581	Alamosa	14.15	3.83	
1582	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	16.56	4.03	
1583	Fremont	16.55	4.34	
1584	La Plata	16.90	3.83	
1585	Mineral	16.97	4.61	
1586	Lowboy Truck	17.25	5.84	
1587	Mechanic	17.79	3.51	
1588	Multi-Purpose Specialty & Hoisting Truck	14.60	3.49	
	Pickup and Pilot Car			
1589	Alamosa, Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Fremont, Gunnison, Hinsdale, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	14.04	3.49	
1590	La Plata	15.47	3.49	
	Semi Truck			
1591	Alamosa, Archuleta, Chaffee, Gunnison, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	19.42	5.41	
1592	Conejos, Custer, Delta, Dolores, Fremont, Hinsdale, La Plata	17.25	5.41	
	Water Truck			
1593	Alamosa	17.58	3.75	
1594	Archuleta, Chaffee, Conejos, Custer, Delta, Dolores, Gunnison, Hinsdale, Mineral, Montrose, Ouray, Rio Grande, Saguache, San Juan, San Miguel	16.75	3.04	
1595	Fremont	16.15	3.14	
1596	La Plata	17.67	3.43	
1597	Montezuma	14.88	2.07	

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

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

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

END OF GENERAL DECISION NO. CO100022

Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.		Modifications			ID
		MOD Number	Date	Page Number(s)	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
General Decision No. CO100023 applies to the following counties: Eagle, Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt and Summit counties.					
General Decision No. CO100023 The wage and fringe benefits listed below reflect collectively bargained rates.					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
1598	CARPENTER (Excludes Form Work)	24.00	11.28		
	TRAFFIC SIGNALIZATION:				
	SUMMIT COUNTY				
	Traffic Signal Installation				
1599	Zone 1	26.42	4.75% + 8.68		
1600	Zone 2	29.42	4.75% + 8.68		
	<u>Traffic Installer Zone Definitions</u> Zone 1 – Within a 35 mile radius measured from the addresses 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 Zone 2 - All work outside these areas.				
1824	ELECTRICIAN (Boom Truck Operator)	20.91	6.10 + 3%	3	
	POWER EQUIPMENT OPERATOR:				
	Drill Rig Caisson				
1601	Smaller than Watson 2500 and similar	24.27	8.62	4	
1602	Watson 2500 similar or larger	25.57	8.62	4	
	IRONWORKER:				
	Structural				
1603	Garfield	23.80	18.07		

General Decision No. CO100023				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
	CARPENTER (Form Work Only):			
1604	Eagle, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	15.92	5.38	
1605	Garfield	19.55	4.09	
	CEMENT MASON/CONCRETE FINISHER:			
1606	Eagle	17.59	2.85	
1607	Garfield	17.27	2.16	
1608	Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt	18.23	2.85	
1609	Summit	15.55	2.85	
	ELECTRICIAN:			
1610	Excludes Traffic Signalization	28.06	8.76	
	Traffic Signalization Electrician			
1611	Eagle, Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	28.24	8.52	
	Traffic Signalization Groundsman			
1612	Eagle, Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt	15.93	4.01	
1613	Summit	16.75	4.10	
	GUARDRAIL INSTALLER:			
1614	Eagle	12.78	3.46	
1615	Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	12.78	3.31	
	HIGHWAY/PARKING LOT STRIPING:			
1616	Truck Driver (Line Striping Truck)	14.60	3.49	
	Painter			
1617	Eagle,	13.85	3.07	
1618	Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	13.97	3.07	
	IRONWORKER:			
	Excludes Guardrail Installation			
1619	Reinforcing	16.94	6.77	
1620	Structural	22.22	6.01	

General Decision No. CO100023				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	LABORER:			
	Asphalt Raker			
1621	Eagle	16.36	3.26	
1622	Garfield	18.66	3.53	
1623	Grand	17.90	3.02	
1624	Jackson, Lake, Moffatt, Routt	17.75	3.75	
1625	Pitkin	17.50	3.75	
1626	Rio Blanco	18.97	3.75	
1627	Summit	16.77	3.26	
	Common or General			
1628	Eagle, Garfield, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	12.44	3.53	
1629	Grand	19.14	3.53	
1630	Concrete Saw (Hand Held)	16.00	6.14	
	Landscape and Irrigation			
1631	Eagle	14.84	3.16	
1632	Garfield, Grand, Jackson, Lake, Moffatt, Rio Blanco, Routt	13.54	3.16	
1633	Pitkin	14.16	3.16	
1634	Summit	13.09	3.16	
	Mason Tender - Cement/Concrete			
1635	Eagle, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	12.44	3.10	
1636	Garfield	14.87	3.10	
	Traffic Control			
1637	Flagger	9.42	3.21	
	Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags, (Excludes Flaggers)			
1638	Eagle, Garfield, Grand, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	12.39	3.20	
1639	Jackson	12.93	3.22	

General Decision No. CO100023				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	PAINTER: (Spray Only)			
1640	Eagle	17.49	3.52	
1641	Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt	17.54	3.52	
1642	Summit	19.96	3.52	
	POWER EQUIPMENT OPERATOR:			
	Asphalt Laydown			
1643	Eagle, Summit	22.67	8.72	
1644	Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Routt	24.09	7.93	
1645	Rio Blanco	23.67	9.22	
1646	Asphalt Paver	22.67	8.72	
1647	Asphalt Plant	19.27	4.47	
	Asphalt Roller			
1648	Eagle	23.01	8.72	
1649	Garfield, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	23.15	8.07	
1650	Grand	22.67	8.72	
1651	Asphalt Spreader	25.61	6.96	
	Backhoe/Trackhoe			
1652	Eagle	22.56	7.02	
1653	Garfield	19.40	4.42	
1654	Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt	22.92	6.15	
1655	Summit	24.30	5.75	
	Bobcat/Skid Loader			
1656	Eagle	18.25	4.32	
1657	Garfield	24.63	0.00	
1658	Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt	21.04	5.18	
1659	Summit	19.77	4.28	

General Decision No. CO100023				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Broom/Sweeper			
1660	Eagle	23.35	7.78	
1661	Garfield, Jackson, Lake, Moffat, Pitkin, Routt	21.92	7.66	
1662	Grand	21.67	8.22	
1663	Rio Blanco	21.66	0.00	
1664	Summit	22.67	8.72	
1665	Bulldozer	26.78	7.05	
1666	Chipper	22.04	8.26	
1667	Crane	23.82	9.22	
1668	Drill	20.84	2.66	
1669	Forklift	18.30	5.01	
1670	Grade Checker	23.82	9.22	
1671	Grader/Blade	23.05	6.45	
1672	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1673	Eagle	24.98	7.55	
1674	Garfield	21.93	9.22	
1675	Grand, Pitkin,	22.67	8.72	
1676	Jackson, Lake, Moffatt, Routt	24.07	7.92	
1677	Rio Blanco	23.67	9.22	
1678	Summit	25.88	7.01	
	Mechanic			
1679	Eagle, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	23.31	3.93	
1680	Garfield	19.80	4.20	
	Oiler			
1681	Eagle	23.82	7.62	
1682	Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	24.04	7.77	

General Decision No. CO100023				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Roller/Compactor (Dirt and Grade Compaction)			
1683	Eagle, Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Routt	22.72	5.98	
1684	Rio Blanco	23.67	9.22	
1685	Summit	24.38	6.11	
	Rotomill			
1686	Eagle	18.86	4.41	
1687	Garfield, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt	20.70	4.41	
1688	Grand	23.48	4.41	
1689	Summit	16.28	4.41	
1690	Scraper	20.60	7.99	
	Screed			
1691	Eagle	17.04	3.98	
1692	Garfield, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	23.76	5.05	
1693	Grand	23.29	4.05	
1694	Tractor	15.08	2.95	

General Decision No. CO100023				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER:			
	Distributor			
1695	Eagle, Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Routt, Summit	19.07	4.35	
1696	Rio Blanco	15.80	5.27	
	Dump Truck			
1697	Eagle	16.17	3.83	
1698	Garfield	16.29	3.83	
1699	Grand, Jackson, Lake, Moffat, Routt	17.79	4.02	
1700	Pitkin	20.13	4.15	
1701	Rio Blanco	17.26	4.63	
1702	Summit	15.27	5.27	
	Lowboy Truck			
1703	Eagle	18.89	4.56	
1704	Garfield, Grand, Jackson, Lake, Moffat, Pitkin, Rio Blanco, Routt, Summit	18.43	4.56	
1705	Mechanic	17.79	3.51	
1706	Multi-Purpose Specialty & Hoisting Truck	14.60	3.49	
1707	Pickup and Pilot Car	14.04	3.49	
1708	Semi Truck	20.72	0.00	
	Water Truck			
1709	Eagle	23.05	2.90	
1710	Garfield	21.00	5.88	
1711	Grand	21.19	3.01	
1712	Jackson, Lake, Moffatt, Pitkin, Routt, Summit	20.39	3.43	
1713	Rio Blanco	17.25	3.75	

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

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

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

END OF GENERAL DECISION NO. CO100023

<p>Decision Nos. CO100016, 17, 18, 19, 20, 21, 22, 23 and 24 dated January 06, 2012 supersedes Decision Nos. CO100018, 19, 20, 21, 22, 23, 24, 25 and 26 dated September 30, 2011.</p> <p>When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.</p>		Modifications			ID
		MOD Number	Date	Page Number(s)	
		1	11-18-11	14	1
		2	01-06-12	1, 10, 14, 19, 25, 29, 34, 42 and 50	2
		3	02-10-12	8, 16, 25, 29, 32, 34, 42 and 50	3
		4	08-10-12	1, 10, 14, 19, 20, 25, 29, 34, 42 and 50	4
<p>General Decision No. CO100024 applies to the following counties: Larimer, Mesa, and Weld counties.</p>					
<p>General Decision No. CO100024 The wage and fringe benefits listed below reflect collectively bargained rates.</p>					
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod	
POWER EQUIPMENT OPERATOR:					
Drill Rig Caisson					
1714	Smaller than Watson 2500 and similar	24.27	8.62	4	
1715	Watson 2500 similar or larger	24.57	8.62	4	
Oiler					
1716	Weld	24.42	8.62	4	
<p>General Decision No. CO100024 The wage and fringe benefits listed below do not reflect collectively bargained rates.</p>					
CARPENTER:					
1717	Excludes Form Work	20.72	5.34		
Form Work Only					
1718	Larimer, Mesa	18.79	3.67		
1719	Weld	16.54	3.90	3	
CEMENT MASON/CONCRETE FINISHER:					
1720	Larimer	16.05	3.00		
1721	Mesa	17.53	3.00		
1722	Weld	17.48	3.00		
ELECTRICIAN:					
Excludes Traffic Signalization					
1723	Weld	33.45	7.58		
Traffic Signalization					
1724	Weld	25.84	6.66		

General Decision No. CO100024				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	FENCE ERECTOR:			
1725	Weld	17.46	3.47	
	GUARDRAIL INSTALLER:			
1726	Larimer, Weld	12.89	3.39	
	HIGHWAY/PARKING LOT STRIPING:			
	Painter			
1727	Larimer	14.79	3.98	
1728	Mesa	14.75	3.21	
1729	Weld	14.66	3.21	
	IRONWORKER:			
	Reinforcing (Excludes Guardrail Installation)			
1730	Larimer, Weld	16.69	5.45	
	Structural (Excludes Guardrail Installation)			
1731	Larimer, Weld	18.22	6.01	
	LABORER:			
	Asphalt Raker			
1732	Larimer	18.66	4.66	
1733	Weld	16.72	4.25	
1734	Asphalt Shoveler	21.21	4.25	
1735	Asphalt Spreader	18.58	4.65	
1736	Common or General	16.29	4.25	
1737	Concrete Saw (Hand Held)	16.29	6.14	
1738	Landscape and Irrigation	12.26	3.16	
1739	Mason Tender - Cement/Concrete	16.29	4.25	
	Pipelayer			
1740	Larimer	17.27	3.83	
1741	Mesa, Weld	16.23	3.36	
1742	Traffic Control (Flagger)	9.55	3.05	

General Decision No. CO100024				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	LABORER (con't):			
	Traffic Control (Sets Up/Moves Barrels, Cones, Installs signs, Arrow Boards and Place Stationary Flags), (Excludes Flaggers)			
1743	Larimer, Weld	12.43	3.22	
1744	PAINTER (Spray Only)	16.99	2.87	
	POWER EQUIPMENT OPERATOR:			
	Asphalt Laydown			
1745	Larimer	26.75	5.39	
1746	Mesa, Weld	23.93	7.72	
1747	Asphalt Paver	21.50	3.50	
	Asphalt Roller			
1748	Larimer	23.57	3.50	
1749	Mesa	24.25	3.50	
1750	Weld	27.23	3.50	
	Asphalt Spreader			
1751	Larimer	25.88	6.80	
1752	Mesa, Weld	23.66	7.36	
	Backhoe/Trackhoe			
1753	Larimer	21.46	4.85	
1754	Mesa	19.81	6.34	
1755	Weld	20.98	6.33	
	Bobcat/Skid Loader			
1756	Larimer	17.13	4.46	
1757	Mesa, Weld	15.37	4.28	
1758	Boom	22.67	8.72	
	Broom/Sweeper			
1759	Larimer	23.55	6.20	
1760	Mesa	23.38	6.58	
1761	Weld	23.23	6.89	

General Decision No. CO100024				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Bulldozer			
1762	Larimer, Weld	22.05	6.23	
1763	Mesa	22.67	8.72	
1764	Crane	26.75	6.16	
	Drill			
1765	Larimer, Weld	31.39	0.00	
1766	Mesa	35.06	0.00	
1767	Forklift	15.91	4.68	
	Grader/Blade			
1768	Larimer	24.82	5.75	
1769	Mesa	23.42	9.22	
1770	Weld	24.53	6.15	
1771	Guardrail/Post Driver	16.07	4.41	
1772	Loader (Front End)			
1773	Larimer	20.45	3.50	
1774	Mesa	22.44	9.22	
1775	Weld	23.92	6.67	
	Mechanic			
1776	Larimer	27.68	4.57	
1777	Mesa	25.50	5.38	
1778	Weld	24.67	5.68	
	Oiler			
1779	Larimer	24.16	8.35	
1780	Mesa	23.93	9.22	
	Roller/Compactor (Dirt and Grade Compaction)			
1781	Larimer	23.67	8.22	
1782	Mesa, Weld	21.33	6.99	

General Decision No. CO100024				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't.):			
	Rotomill			
1783	Larimer	18.59	4.41	
1784	Weld	16.22	4.41	
	Scraper			
1785	Larimer	21.33	3.50	
1786	Mesa	24.06	4.13	
1787	Weld	30.14	1.40	
	Screed			
1788	Larimer	27.20	5.52	
1789	Mesa	27.24	5.04	
1790	Weld	27.95	3.50	
1791	Tractor	13.13	2.95	
	TRAFFIC SIGNALIZATION:			
	Groundsman			
1792	Larimer	11.44	2.84	
1793	Mesa	16.00	5.85	
1794	Weld	16.93	3.58	
	TRUCK DRIVER:			
	Distributor			
1795	Larimer	19.28	4.89	
1796	Mesa	19.17	4.84	
1797	Weld	20.61	5.27	
	Dump Truck			
1798	Larimer	18.86	3.50	
1799	Mesa	15.27	4.28	
1800	Weld	15.27	5.27	

General Decision No. CO100024				
The wage and fringe benefits listed below do not reflect collectively bargained rates.				
Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER (con't.):			
	Lowboy Truck			
1801	Larimer	18.96	5.30	
1802	Mesa, Weld	18.84	5.17	
1803	Mechanic	26.48	3.50	
	Multi-Purpose Specialty & Hoisting Truck			
1804	Larimer, Mesa	16.65	5.46	
1805	Weld	16.87	5.56	
1806	Pickup and Pilot Car	13.93	3.68	
1807	Semi/Trailer Truck	18.39	4.13	
1808	Truck Mounted Attenuator	12.43	3.22	
	Water Truck			
1809	Larimer	19.14	4.99	
1810	Mesa	15.96	5.27	
1811	Weld	19.28	5.04	

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

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program.

If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

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

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

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

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

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

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

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

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

END OF GENERAL DECISION NO. CO100024

CITY AND COUNTY OF DENVER

STATE OF COLORADO



TECHNICAL SPECIFICATIONS

Contract No. 201207522

**SHE 2011 PKG 2 - TRAFFIC SIGNAL
UPGRADE**

August 29, 2012

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

**2011 SAFETY HAZARD ELIMINATION PROJECT
PACKAGE 2**

Federal Aid Project SHE R600-391: Subaccount 18197

General contract conditions used for this project shall be the City & County of Denver, Department of Public Works, "Standard Specifications for Construction General Contract Conditions," 2011 Edition and revisions thereto as hereinafter modified.

STANDARD CONSTRUCTION SPECIFICATIONS

Standard construction specifications used for this project shall be the Colorado Department of Transportation "Standard Specifications for Road and Bridge Construction" adopted in 2011 and revisions thereto as hereinafter modified. In addition, the Colorado Department of Transportation Standard Special Provisions are also to be used as applicable and as identified herein.

DETAILED CONSTRUCTION SPECIFICATIONS

Construction specifications for this project shall consist of the applicable sections and subsections of the above referenced "Colorado Department of Transportation Standard Specifications for Road and Bridge Construction."

The following Project Special Provisions take precedence over the Specifications or Plans and supplement or amend the referenced "Standard Specifications for Road and Bridge Construction," adopted in 2011 by the Colorado Department of Transportation, which shall be used to control construction of this project.

References to "Division" or "CDOT" in the Standard Specifications, Standard Special Provisions or Project Special Provisions shall be considered to mean the City & County of Denver for the purposes of this project. References to "the Engineer" in the Standard Specifications shall be considered to mean the City & County of Denver Project Manager for the purposes of this project.

STANDARD CONSTRUCTION DETAILS

Applicable City & County of Denver Transportation Standards & Details for the Engineering Division (2010) are required to be used by the Contractor. For other applicable details, except as modified or altered by the general notes on the plans or by the specifications, standard special provisions or project special provisions, it is the intent of the City & County of Denver to use the Colorado Department of Transportation M & S Standards, most recent edition. Drainage related appurtenances shall be constructed as shown in the City and County of Denver Department of Public Works document entitled "Storm Drainage and Sanitary Sewer Construction Details and Technical Specification." This document can be found at the following web address: <http://denvergov.org/tabid/436483/Default.aspx>. Traffic signals and related appurtenances are to be constructed as per the City & County of Denver Traffic Engineering Services Project Specials, attached to the plans.

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

**2011 SAFETY HAZARD ELIMINATION PROJECT
PACKAGE 2
Federal Aid Project SHE R600-391
Subaccount 18197**

CONSTRUCTION LIMITS

Construction limits for the project are defined as the following six intersections:

1. Alameda Avenue and Clay Street
2. Alameda Avenue and Lipan Street
3. Alameda Avenue and Platte River Drive
4. Sheridan Boulevard and US-285 Northbound Ramps (South Intersection)
5. Sheridan Boulevard and US-285 Southbound Ramps (North Intersection)
6. Sheridan Boulevard and 25th Avenue/Byron Place

Furthermore, the construction limits include the main and cross streets at each intersection as necessary to complete the work, and placement of any signage on any public street, sidewalk or alley to be used for construction phasing and construction traffic control purposes. All work shall occur within the City & County of Denver right-of-way. Impacts to existing landscaping, concrete, sidewalk, structures, sprinklers, curbs, gutters and so on that occur beyond the right-of-way shall be repaired by the Contractor at its own expense. Impacts to existing landscaping, concrete, sidewalk, structures, sprinklers, curbs, gutters and so on that occur within the right-of-way, but are not specifically designated to be removed by the plans or as directed by the Engineer, shall be repaired by the Contractor at its own expense.

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

**2011 SAFETY HAZARD ELIMINATION PROJECT
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**REVISION OF SECTION 105
COOPERATION BETWEEN CONTRACTORS**

Section 105 of the Standard Specifications is hereby revised for this project as follows:

Subsection 105.12 shall include the following:

Other construction agencies may be working within or near the project limits. The Contractor for this project shall conduct and coordinate the work with these contractors so as not to interfere with or hinder the progress and completion of the work being performed by other agencies or contractors. The Contractor shall contact all contractors working within the project limits, and assign contact personnel between them. The Contractor shall notify the Engineer in writing of these contacts and of what arrangements have been made.

All traffic control conflicts that arise between the needs of the various construction contractors or other agencies shall be brought to the attention of the Engineer. The Engineer shall determine the method of resolution in such instances.

The Contractor shall coordinate all lane closures to ensure that minimum lane requirements are met.

The Department will not recognize claims filed for impact from other contractor presence due to the Contractor's failure to coordinate.

All costs subsidiary and incidental to the foregoing requirements shall be included in the original contract prices for the project and will not be paid separately.

**End Revision of Section 105
Cooperation Between Contractors**

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**REVISION OF SECTION 106
CONFORMITY TO THE CONTRACT OF HOT MIX ASPHALT**

Section 106 of the Standard Specifications is hereby replaced for this project as follows:

Subsection 106.05 shall include the following:

For this project, Contractor process control testing of hot mix asphalt is required.

**End Revision of Section 106
Conformity to the contract of Hot Mix Asphalt**

**REVISION OF SECTION 107
WORKER SAFETY**

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

Subsection 107.06 shall include the following:

If the Contractor is ordered to cease operations due to violations of noise ordinance as a result of equipment back-up alarms, the Contractor shall take whatever actions are necessary to comply with the ordinance and continue the project. This includes the option of using an observer in lieu of using the equipment back-up alarms as allowed by 29 CFR 1926.601(b)(4)(II) of the OSHA Safety and Health Standards. Should the Contractor fail to mitigate the noise ordinance violation, the Contractor shall be deemed to have waived any right to a claim as a result of work suspension or being required to perform the work at times not specified in the contract.

If the Contractor uses an observer in lieu of back-up alarms, the following items are required:

1. For night work, there shall be sufficient light for the observer and the operator to see each other clearly. Lighting shall conform to the requirements of 29 CFR 1926.56.
2. The observer shall be positioned where the equipment operator and observer can see each other at all times.
3. The observer shall be able to see the area behind the vehicle being backed so that the observer can signal the equipment operator and warn any person to stay clear of the danger area.
4. The observer shall stay out of the back-up area.
5. The equipment operator, observer and others in the immediate work area shall be trained on the signals used.

All costs subsidiary and incidental to the foregoing requirements shall be included in the original contract prices for the project and will not be paid for separately.

**End Revision of Section 107
Worker Safety**

**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 protect all existing vegetation (including trees, shrubs, ground cover, grasses, wetland and riparian vegetation) adjacent to project work areas, except for vegetation that must be removed to accommodate construction of the project. Specific areas of vegetation to be protected shall be as directed by the Engineer and shall be delineated with temporary orange construction fencing with metal posts. Fencing shall be installed at the drip line of trees or as designated by the Engineer. Equipment shall not be installed or material stockpiled within 15 feet of existing trees designated to remain.

The Contractor shall perform all work in a manner that minimizes environmental damage. Questions about specific areas or vegetation shall be directed to the Engineer for resolution prior to any removal or activity damaging the vegetation in question.

The Contractor shall promptly report any vegetation within protected areas that is damaged by construction activities to the Engineer for the assessment of damages. If vegetation within fenced areas is damaged or destroyed, it shall be at the Contractor's expense. Vegetation of replaceable size shall be replaced. The determination of whether a plant is of replaceable size will be made by the Engineer. If trees or shrubs larger than replaceable size are damaged or destroyed, the Contractor shall be liable for the appraised value, based on the current official publication of the International Society of Arboriculture, Guide for Plant Appraisals. A consulting arborist may be retained by the Engineer to determine value of the trees and shrubs. This value and the arborist fee will be deducted from any monies due to the Contractor. The value of such trees or shrubs will be based on tree size, species, location and condition.

If the delineating fence is knocked down or destroyed by the Contractor, the Engineer may suspend the work, wholly or in part, until the fence is repaired to the Engineer's satisfaction at the Contractor's expense. Time lost due to such suspension of work will not be considered a basis for adjustment of time charges, but will be charged as contract time.

Protection of existing vegetation, including all costs subsidiary and incidental to the foregoing requirements shall be included in the original contract prices for the project and will not otherwise be paid for separately.

**End Revision Section 107
Protection of Existing Vegetation**

**REVISION OF SECTION 108
COMMENCEMENT AND COMPLETION OF WORK**

Section 108 of the Standard Specifications is hereby revised for this project as follows:

In subsection 108.03, second paragraph, delete the first sentence and replace with the following:

The Contractor shall present a preliminary bar chart to the Engineer at or prior to the preconstruction conference. The preliminary bar chart shall show the major features of the project for the entire proposed schedule duration.

Erosion and Sediment Control activities shall specifically be included as a salient feature on the Contractor's schedule.

**End Revision of Section 108
Commencement and Completion of Work**

**REVISION OF SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

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

Subsection 202.01 shall include the following:

After removal, exposed subgrade surface shall be finished to a smooth and uniform surface conforming to the typical approved plan-specified grade.

All references to curb and gutter shall be construed to include concrete curb and gutter, asphalt mat overlying gutter pan, concrete gutter pan, granite-block curb, and stone curb.

This work will include removal and disposal of storm sewer inlets, manholes, pipe, and curb and gutter as required.

Subsection 202.02 shall include the following:

The Contractor shall mark the limits of removals in the field and shall arrange for same to be verified by the Engineer or his or her representative.

Removals shall be completed to the proposed subgrade elevation for the work, or as otherwise designated by the Engineer.

Removed concrete and asphalt material may not be used to construct embankments.

Culverts, pipes or sewers may not be left in place and filled unless directed to do so by the Engineer. Storm sewers shall be removed per approved plan details.

Storm drain protection devices shall be installed prior to the commencement of removal activities.

Removals in the vicinity of trees to remain shall conform to applicable provisions of the Tree Retention and Protection specification, as prepared by the Denver Forestry Division.

Subsection 202.03 is hereby deleted and replaced with the following:

All salvable material shown on the plans shall be removed, without unnecessary damage, in sections or pieces that may be readily transported, and delivered by the Contractor to the location noted in the plans or Project Special Provisions, or as otherwise directed by the Engineer. The Contractor shall be held responsible for the safekeeping of all salvable materials during the period of the Contract until they are delivered to the City.

The Contractor shall make good or replace at its own expense any such materials damaged, stolen or lost prior to receipt by the City. All salvable materials, as designated on the plans, shall remain the property of the City.

Subsection 202.05 shall be revised to include the following:

Pavement marking used for temporary traffic control on pavement to remain shall be removed in a manner that does not damage the pavement surface. Sandblasting, grinding or hydro-blasting shall not be allowed.

Subsection 202.07 is hereby replaced as follows:

**REVISION OF SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

All concrete pavement, sidewalks, structures, curbs, gutters, asphalt pavement, etc., designated for removal shall be broken into pieces and recycled, or disposed of outside the limits of the project unless otherwise designated in the plans or as directed by the Engineer.

Old concrete construction which abuts new construction, edges of pavement, sidewalks, curbs, etc., to be left in place shall be saw cut to a true line with a vertical face.

Where old asphalt construction abuts new construction, edges of asphalt pavement, patching, etc., to be left in place shall be wheel cut or saw cut to a neat vertical face with minimal jagged edges to the satisfaction of the Engineer. The Engineer, at his or her discretion, may require asphalt to be saw cut.

Subsection 202.09 shall include the following:

Removal of asphalt mat from gutters to remain shall be accomplished by planning and/or scraping. If the existing gutter is to remain, the gutter shall be cleaned until the pan is completely clean of residue. Gutters which are excessively (greater than one-quarter inch in depth) planed or damaged shall be removed and replaced by the contractor at its expense. If gutter is designated for removal, no separate payment shall be made for asphalt removal.

Subsection 202.11 shall include the following:

Removals of concrete paving, cross pans, curb ramps, driveways and sidewalks will be measured by area in square yards, regardless of thickness.

Removal of asphalt mat will be measured by square yard. If the asphalt mat is greater than 4" and is over concrete pavement, both asphalt removal and concrete removal will be paid. If the asphalt mat is less than 4" and is over concrete pavement, only concrete pavement removal will be paid. Should brick pavers be encountered during asphalt removal, removal of brick pavers shall be considered subsidiary to the removal of the asphalt mat.

Removal of asphalt mat (planning) will be measured by the square yard, regardless of thickness.

Removal of asphalt mat from concrete gutter and other concrete designated to remain shall be measured by the square yard. Removal of asphalt mat from gutter shall include cleaning as part of that pay item.

Subsection 202.12 is hereby deleted and replaced as follows:

The accepted quantities will be paid at the contract unit price for each of the pay items listed below that appear in the bid schedule.

Payment shall be full compensation for saw cutting, scraping, sandblasting, removing, hauling, plugging and disposal of such items, excavation and subsequent backfill (with moisture/density control per the revision to Subsection 203.07) to proposed subgrade elevation.

The price shall also include salvageable materials removed, their custody, preservation, storage, haul and disposal.

Payment will be made under:

**REVISION OF SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

<i>Pay Item</i>	<i>Pay Unit</i>
Removal of Inlet	Each
Removal of Pipe	Linear Foot
Removal of Bollard	Each
Removal of Concrete Median Cover Material	Square Yard
Removal of Sidewalk	Square Yard
Removal of Curb	Linear Foot
Removal of Gutter	Linear Foot
Removal of Curb and Gutter	Linear Foot
Removal of Concrete Curb Ramp	Square Yard
Removal of Concrete Pavement	Square Yard
Removal of Asphalt Mat	Square Yard
Removal of Fence	Linear Foot

**End Revision of Section 202
Removal of Structures and Obstructions**

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**REVISION OF SECTION 202
REMOVAL OF TRAFFIC SIGNAL EQUIPMENT**

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

Subsection 202.01 shall include the following:

This work shall consist of the disconnection and removal of existing traffic signal equipment located at the following six intersections:

1. Alameda Avenue and Clay Street
2. Alameda Avenue and Lipan Street
3. Alameda Avenue and Platte River Drive
4. Sheridan Boulevard and US-285 Northbound Ramps (South Intersection)
5. Sheridan Boulevard and US-285 Southbound Ramps (North Intersection)
6. Sheridan Boulevard and 25th Avenue/Byron Place

Upon removal, those items referenced herein shall be: 1] disposed of in accordance with the Standard Specifications and City & County of Denver ordinances; or 2] delivered to the City & County of Denver.

Subsection 202.02 shall include the following:

Signal Heads, Pedestrian Heads, Push Buttons, Fire Preemption and Cameras

Remove all existing traffic signal heads, pedestrian signal heads, pedestrian push buttons, fire preemption equipment and detection cameras and retain these items for salvage. Deliver all such items designated for salvage to the City and County of Denver traffic signal maintenance facilities located at 5440 Roslyn Street, Denver.

Elements ancillary to existing signal heads, pedestrian heads and push buttons including mounting hardware and backplates are the property of the Contractor and shall be properly disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Elements ancillary to existing cameras and fire preemption equipment including mounting hardware and wiring are the property of the Contractor and shall be properly disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Mast Arms and Span Wire

Remove existing mast arms and span wire from all traffic signal poles. All removed items including the mast arms and span wire are the property of the Contractor and shall be disposed of in accordance with the applicable sections of the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Traffic Signal Poles with Luminaire; and Light Poles

Traffic signal-light poles (span wire and mast arm types), light poles, luminaire arms and luminaires are owned by XCEL Energy. In all such cases, the Contractor shall remove the mast arm or span wire. XCEL Energy shall remove the pole, and the Contractor shall remove portions of the existing foundation as described below. Following mast arm or span wire removal by Contractor and pole removal by XCEL Energy forces, Contractor shall remove existing traffic signal-light pole foundation to a minimum depth of one foot below finished grade or as otherwise dictated by construction requirements or as directed by the Engineer. Removed portions of traffic signal-light pole foundations are the property of the Contractor and shall be disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances. Contractor shall coordinate as may be required with XCEL Energy to schedule activities and facilitate timely removal of poles.

**REVISION OF SECTION 202
REMOVAL OF TRAFFIC SIGNAL EQUIPMENT**

Contractor is required to remove light pole foundations for selected light poles to be removed along the Alameda segment of the project as depicted in the plans. In all such cases, XCEL Energy shall remove the pole, and the Contractor shall remove portions of the existing foundation as described below.

Contractor shall backfill areas where existing foundations have been removed with clean fill material, flow-fill or non-shrink grout depending upon location and as directed by the Engineer.

Pedestal Poles and Traffic Signal Poles without Luminaires

Remove all existing pedestal poles and traffic signal poles without luminaires. Work shall include removal of the existing pedestal pole or signal pole foundation to a minimum depth of one foot below finished grade.

All removed items including the poles, mast arms and removed portion of pole foundations are the property of the Contractor and shall be disposed of in accordance with the applicable sections of the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Contractor shall backfill areas where existing foundations have been removed with clean fill material, flow-fill, or non-shrink grout depending upon location and as directed by the Engineer.

Cabinets and Controllers

Remove existing cabinets and controllers and retain cabinets and all appurtenances for salvage. Deliver cabinet including all appurtenances not designated for reset to the City & County of Denver traffic signal maintenance facilities located at 5440 Roslyn Street, Denver.

Work shall include removal of the existing cabinet foundation in its entirety. The removed foundation is the property of the Contractor and shall be disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances. Contractor shall backfill areas where existing foundations have been removed with clean fill material, flow-fill, or non-shrink grout as directed by the Engineer.

Existing signal system communications equipment including patch panels, strain relief, cable ties, fiber optic modems and so on shall be included among the cabinet appurtenances designated for salvage and returned to the City. When signal system communications are re-established during the installation phase, all required communications equipment shall be new; furnished and installed by the Contractor, or in some cases furnished by the City and installed by the Contractor.

Sign Panels

Sign panels attached to existing traffic signal equipment shall be removed, shall become the property of the Contractor, and shall be legally disposed of accordingly.

Items to be Abandoned

Existing conduits, loop detectors and underground wiring shall be abandoned in place.

Fiber Optic Lateral Cable

Those segments of lateral fiber optic cable identified in the plans for removal, shall be removed by the Contractor accordingly. Removed lateral cable is the property of the Contractor and shall be disposed of in accordance with the applicable sections of the Standard Specifications, as well as in accordance with applicable laws and ordinances.

**REVISION OF SECTION 202
REMOVAL OF TRAFFIC SIGNAL EQUIPMENT**

Pull Boxes

Contractor shall remove existing pull boxes and/or valve boxes from sidewalks, roadways or landscaped areas not within the existing or proposed roadway. In grass or landscaped locations, Contractor shall backfill areas where existing boxes have been removed with clean fill material as directed by the Engineer. Where valve boxes are to be removed from paved areas, Contractor shall backfill excavated area with flow-fill, non-shrink grout or other material as approved by the Engineer.

Surface Restoration

Contractor shall restore surface areas disturbed by removal of the described traffic signal items in-kind equal to or exceeding original condition. In grass or landscaped locations, Contractor shall reseed backfilled areas as directed by the Engineer. In sidewalks or curb ramps, new sidewalk or curb ramp shall be installed by the Contractor as directed by the Engineer. In cases where existing sidewalk or curb ramp has been damaged, disturbed or otherwise requires restoration, the entire sidewalk panel or curb ramp shall be replaced. Existing sidewalk or curb ramp materials removed by the Contractor during the course of such operations shall be disposed of by the Contractor in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Where existing valve boxes have been removed, Contractor shall backfill excavated area with flow-fill, non-shrink grout or other material as approved by the Engineer.

Subsection 202.03 shall include the following:

The Contractor shall safeguard all salvageable materials and shall be responsible for the expense of repairing or replacing damaged or missing material until it is delivered to the City & County of Denver maintenance yard at 5440 Roslyn Street, Denver.

Delivery of Salvaged Items

Proposed delivery times and dates for the salvaged items shall be agreed to by the City prior to delivery and shall be coordinated with the City & County of Denver. Coordinate with Chris Lillie at 720-865-4066 or Greg Salazar at 303-591-7146.

Subsection 202.04 shall include the following:

All Light Emitting Diode (LED) signal lenses in existing signal faces shall be removed prior to removal of the signal face. LED lenses shall be protected from damage and delivered to the City & County of Denver traffic signal maintenance facilities located at 5440 Roslyn Street, Denver. This work shall be included in the lump sum cost for Removal of Traffic Signal Equipment and will not be measured and paid separately.

Subsection 202.11 shall include the following:

Removal of Traffic Signal Equipment shall be paid on a lump sum basis for all intersection locations combined and shall include physical disconnection, disassembly and removal of the described items; disposal of non-salvageable material including removed foundations, pedestal poles and so on; backfill of excavated removal areas; and surface restoration of grass, landscaped, sidewalk, curb ramp or on-street areas disturbed by the removal activities.

Coordination with the City and delivery of salvaged items to the City maintenance yard shall be considered included in the lump sum cost and will not be measured and paid separately.

All required coordination with XCEL Energy shall be considered included in the lump sum cost and will not be measured and paid separately.

**REVISION OF SECTION 202
REMOVAL OF TRAFFIC SIGNAL EQUIPMENT**

Traffic signal items to be reset will be measured and paid separately under the appropriate pay item.

Subsection 202.12 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Removal of Traffic Signal Equipment	Lump Sum

**End Revision of Section 202
Removal of Traffic Signal Equipment**

**REVISION OF SECTION 202
REMOVAL OF PAVEMENT MARKINGS**

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

In Subsection 202.11, remove the second paragraph and replace with the following:

Removal of pavement marking will not be measured and paid for separately, but will be considered included in the unit cost for new pavement markings.

Sandblasting or other surface preparation that may be required to prepare pavement surfaces for the application of new pavement markings will not be measured and paid for separately, but will be considered included in the unit cost for new pavement markings.

**End Revision of Section 202
Removal of Pavement Markings**

**REVISION OF SECTION 202
REMOVAL OF DELINEATORS**

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

Subsection 201.02 shall include the following:

Contractor shall remove and dispose of all delineators identified for replacement as shown in the plans. Removed delineators are the property of the Contractor and shall be properly disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Subsection 202.11 shall include the following:

Removal of delineators will not be measured and paid for separately, but will be considered included in the unit cost for new delineators.

**End Revision of Section 202
Removal of Delineators**

**REVISION OF SECTION 202
REMOVAL OF SIGN PANEL**

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

Subsection 201.02 shall include the following:

Contractor shall remove and dispose of all sign panels attached to the existing traffic signal poles, mast arms and span wire equipment.

Removed sign panels are the property of the Contractor and shall be properly disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Subsection 202.11 shall include the following:

Removal of sign panel will not be measured and paid for separately, but will be considered included in the lump sum cost for removal of traffic signal equipment.

**End Revision of Section 202
Removal of Sign Panel**

**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:

The existing asphalt mat, which varies in thickness, shall be removed in a manner that minimizes contamination of the removed mat with underlying material. The removed asphalt mat material shall become the property of the Contractor and shall be disposed of by one of the following methods:

- (g) Use in embankment construction in accordance with Subsection 203.06
- (h) Place material in bottom of fills as approved by the Engineer
- (i) Place material in subgrade soft spots outside of the roadway prism as directed by the Engineer
- (j) Recycle into Hot Mix Asphalt

Subsection 202.11 shall include the following:

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

Subsection 202.12 shall include the following

Payment will be made under:

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

**End Revision of Section 202
Removal of Asphalt Mat**

**REVISION OF SECTION 202
CLEAN CULVERT (SPECIAL)**

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

Subsection 202.01 shall include the following:

This work consists of cleaning, maintaining, removing and disposing of sediment and other debris in the storm drain inlets and culverts at locations shown in the plans.

Subsection 202.02 shall include the following:

Prior to beginning any work other than traffic control, debris and dirt in all existing inlets, culverts and storm drains within project limits shall be dislodged and removed to the greatest extent possible. Cleaning shall be paid for as 202 Clean Culvert (Special), each. Cleaning shall be done by Vector removal methods. The Contractor shall document the amount of sediment removed and provide the volume quantity to the Engineer. The Contractor shall remove and fully re-secure all grates per CDOT or City standards as applicable. The Contractor shall treat the bolts with anti-seize compound prior to reinstallation. All work, including drilling out of broken bolts, re-tapping bolt holes, replacement bolts, anti-seize treatment, and providing missing bolts necessary to re-secure the grates shall be included in the cost of the work. If construction-related sediment or debris has accumulated in the inlet or culvert after initial cleaning and during construction, the Contractor shall clean, remove and dispose of the sediment and debris at the Contractor's expense. In case of work suspension longer in duration than one month, due to unsuitable weather, the Contractor shall re-clean the storm drain inlets and culverts as directed by the Engineer.

Subsection 202.11 shall include the following:

Clean Culvert (Special) shall be measured by the actual number of existing inlets to be cleaned within the project limits.

Subsection 202.12 shall include the following:

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Clean Culvert (Special)	Each

**End Revision of Section 202
Clean Culvert (Special)**

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**REVISION OF SECTION 203
POTHOLING**

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

In subsection 203.13, delete paragraph (e), and insert the following:

Potholing will be measured by the number of potholes provided as directed. All other related work, including removal of existing pavement, backfilling, shoring and labor will not be measured and paid for separately, but shall be considered included in the work. Labor and materials required for surface restoration following potholing activities shall not be measured and paid separately but shall be considered included in the unit cost for this item.

Subsection 203.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Potholing	Each

**End Revision of Section 203
Potholing**

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**REVISION OF SECTION 203
EXCAVATION AND EMBANKMENT**

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

Subsection 203.01 shall include the following:

Fencing shall be erected around all excavations greater than 4 feet deep to preclude public access when unattended.

Subsection 203.03 (a) shall include the following:

Embankment material imported onto the project shall be tested for water soluble sulfates using CP-1 2103 Method B prior to being allowed on the project. The tests shall be performed by the supplier or Contractor. The average of three consecutive tests shall show that the sulfate content is not greater than that corresponding to the sulfate exposure level specified on the plans. The default level shall be class 0, the lowest severity level, if no levels are shown on the plans. Refer to 601.04 for exposure level criteria. No single test shall have sulfate content more than 20% greater than that corresponding to the sulfate exposure level specified on the plans for non-CDOT projects.

The City's Testing Agency may also test for sulfates at the import source, and shall also test imported material brought to the project for sulfates. The Contractor shall not use any materials represented by any single failing test until resolution by the following is achieved. The City's Testing Agency, the Contractor's QC lab, and an independent test lab shall each get one sample.

A single failing test shall have the remaining sample split into four equal portions. The Engineer shall receive one portion, the Contractor shall receive one portion and the remaining two portions shall go to the City's Testing Agency, which shall retest the sample. If the results are within 10% of each other, the remaining split sample will be sent to a second independent laboratory for testing using CP-L 2103. The independent laboratory will be mutually agreed upon by the City and the Contractor. The independent laboratory's result will be used for Contract compliance.

If the water soluble sulfate content is less than that corresponding to the sulfate exposure level specified on the plans, the City will bear all costs associated with the second independent lab test. If the soluble sulfate content is greater than that corresponding to the sulfate exposure level specified on the plans, all costs associated with independent laboratory testing shall be at the Contractor's expense. This testing shall not be cause for time extension or other claims by the Contractor.

Embankment represented by failing tests shall be removed from the project and replaced at the Contractor's expense.

Subsection 203.04 shall be revised to include the following:

The Contractor shall protect and promptly dewater and recondition all excavations from water, regardless of source.

Subsection 203.05 (c), first paragraph, shall be revised to include the following:

Approved backfill material shall be Aggregate Base Course (Class 6) or other material as approved by the Engineer.

Subsection 203.07 shall be revised to include the following:

**REVISION OF SECTION 203
EXCAVATION AND EMBANKMENT**

Unless otherwise indicated on the plans, the density requirements for embankment material shall be: clay soils – 95% of the maximum density determined in accordance with AASHTO T-99; granular soils – 95% of the maximum density determined in accordance with AASHTO T-180.

In Subsection 230.09, delete the first paragraph and replace with the following:

Proof Rolling. Proof rolling shall be conducted with a double tandem ten-wheel end-dump truck, loaded to a minimum gross weight of 45,000 pounds, or other equipment approved by the Engineer. Areas found to be weak, and those areas that failed, shall be ripped, scarified, dried or wetted as necessary and re-compacted to the requirements for density and moisture at the Contractor's expense. The Engineer may allow hand-operated compactors to be used in small or otherwise inaccessible areas.

Subsection 203.13 shall include the following:

Excavation and embankment, or any items associated with that work, shall not be measured and paid separately, but shall be considered included in the other items of the work.

**End Revision of Section 203
Excavation and Embankment**

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**REVISION OF SECTION 203
SWEEPING**

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

Subsection 203.01 shall include the following:

This work is for sweeping paved surfaces during construction as part of the project Best Management Practices (BMP).

Subsection 203.04 shall include the following:

Paved surfaces adjacent to the construction site shall be swept by the close of business day and during the day as needed when sediment and other materials are tracked or discharged onto them. Sweeping shall be completed with a pickup broom or equipment capable of collecting sediment. Sweeping with a kick broom will not be allowed. Street sweepers using water while sweeping is preferred in order to minimize dust. Flushing off paved surfaces with water is prohibited.

Subsection 203.14 shall include the following:

Sweeping, when used as a BMP as shown in the Contract, will be measured by the number of hours that a pickup broom or equipment capable of collecting sediment, authorized by the Engineer, is used to remove sediment from the roadway or other paved surfaces. Each week the Contractor shall submit to the Engineer a statement detailing the type of sweeping equipment used and the number of hours it was used to pick up sediment. Operator will not be measured and paid for separately, but shall be included in the work.

Subsection 203.14 of the Standard Specifications shall be modified as follows:

Sweeping will not be measured and paid for separately but shall be included in project Force Account for Erosion Control.

**End Revision of Section 203
Sweeping**

**REVISION OF SECTION 208
STORM DRAIN INLET PROTECTION**

Section 208 of the Standard Specifications is hereby revised for this project as follows:

Subsection 208.01 shall include the following:

This work consists of the installation of gravel bags at all locations where storm drain inlets will receive construction generated water runoff. Storm drainage inlet protection shall be installed at all effected inlets prior to any boring/trenching or construction activities.

Subsection 208.02 shall include the following:

Gravel bags shall consist of aggregate filled fabric with the following dimensions:

Diameter	4 to 6 inches
Section Length	1 foot minimum

The sediment control device shall consist of a woven geotextile fabric with the following properties:

Grab tensile strength	90 lbs. min.	ASTM D 4632
Trapezoid Tear Strength	25 lbs. min.	ASTM D 4533
Mullen Burst	300 psi.	ASTM D 3786
Ultraviolet Resistance	70%	ASTM D 4355

Gravel bags shall be capable of remaining in place during a storm event. Aggregate contained in the gravel bags shall consist of gravel or crushed stone conforming to Table 703-7 for Class C.

Subsection 208.05 shall include the following:

Urban inlet protection with hard paved surfaces shall be sewn geotextile fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides. The inlet protection shall be a Beaver Dam style as manufactured by Dandy Products Inc. (1-800-591-2284) (www.dandyproducts.com) or approved equal.

Gravel bags shall be placed on a stable surface, consisting of either pavement, grass or aggregate. Gravel bags shall be placed to conform to the surface without gaps. Discharge water shall not cause erosion.

Subsection 208.07 shall include the following:

Gravel Bags will be measured by each bag that is installed and accepted.

Subsection 208.08 shall include the following:

Storm drain inlet protection will not be measured and paid for separately; however gravel bags and labor for sediment removal and disposal shall be included in the project Force Account for Erosion Control.

**End Revision of Section 208
Storm Drain Inlet Protection**

**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", 1999 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.

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.

**REVISION OF SECTION 208
EROSION CONTROL**

Minor SWMP Modification: Modification to the SWMP that does NOT increase the scope or change hydrology of the Project but: modifies/improves specific BMPs in use at site, indicates progression in phasing of the Project, or specifies relocation of previously approved BMPs within the Project. 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.

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

**REVISION OF SECTION 208
EROSION CONTROL**

- (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 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.

Preparation of or adjustments to a SWMP must be performed by or under supervision of a Professional Engineer licensed in the State of Colorado. SWMP elements submitted to the City shall 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.

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 set forth within the Project SWMP or as noted on the Contract Drawings.

**REVISION OF SECTION 208
EROSION CONTROL**

PART IV: EROSION CONTROL PERMIT STATUS

The current SWMP status for the Project is as follows:

A SWMP 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 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)

Approved erosion and sediment control ‘Best Management Practices’ shall be maintained and kept in good repair 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 following Best Management Practices (BMPs) on site during construction:

1. **VEHICLE TRACKING CONTROL:** This BMP is required at all access points to a construction site that are used by vehicular traffic or construction equipment.
2. **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.
3. **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. Acceptable BMPs include:
 - a) Preserving existing vegetation
 - b) Seeding and planting
 - c) Mulching
 - d) Mulching and seeding
 - e) Temporary/Permanent re-vegetation operations
 - f) Chemical soil stabilizer application (requires Permit Enforcement Authority approval)

**REVISION OF SECTION 208
EROSION CONTROL**

4. **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.
5. **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.
6. **CHUTE WASHOUT CONTAINMENT:** Water used in the cleaning of ready mixed concrete 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 concrete waste shall be removed from the containment area and properly disposed of.
 - a) Should a predefined bermed containment area not be available due to the project size, or lack of an area with a suitable ground surface for establishing a containment area, proper disposal of ready mix washout and rinse off water at the job site shall conform to the approved techniques and practices identified in the Colorado Department of Public Health & Environment's training video entitled "Building For a Cleaner Environment, Ready Mix Washout Training", and its accompanying manual entitled, "Ready Mix Washout Guidebook, Vehicle and Equipment Washout at Construction Sites."
 - b) The direct or indirect discharge of water containing waste concrete to the storm sewer system is prohibited (Sec.56-102a, c; Revised Municipal Code, City and County of Denver).
 - c) Information about, or copies of the video and training manual are available from the Water Quality Control Division, Colorado Department of Public Health & Environment, 4300 Cherry Creek Drive South, Denver, Colorado 80222-1530, (303) 692-3555.
7. **STREET SWEEPING:** This BMP requires that paved surfaces which are adjacent to construction sites be swept in a timely manner 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 is preferred in order to minimize dust. Flushing off paved surfaces with water is prohibited.
8. **PERIMETER CONTROL:** This BMP requires that a construction site install a perimeter control measure along the edge of the construction site, to prevent, or filter the discharge of surface runoff from the construction site. The type of perimeter control used shall be determined based on site conditions and location. Maintenance and repair of the control measure shall occur as needed, in a timely manner.
9. **STOCK PILES:** Soils that will be stockpiled for more than thirty (30) days shall be protected from wind and water erosion within fourteen (14) days of stockpile construction. Stabilization of stockpiles located within 100 feet of an MS4 or State Waters, or with slopes 3 to 1 or greater shall be completed within seven (7) days following stockpile construction. Stabilization and protection of the stockpile may be accomplished by any of the following: Mulching, Temporary/Permanent Revegetation Operations, Chemical Soil Stabilizer Application (requires Permit Enforcement Authority approval), or erosion control matting/Geotextiles. If stockpiles are located within 100 feet of an MS4 or State Waters, a drainageway or the site perimeter, additional sediment controls shall be required.

**REVISION OF SECTION 208
EROSION CONTROL**

10. 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 occur. 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).”

PART V: BASIS OF PAYMENT

Concrete wash out structures and clean culvert will be measured and paid in accordance with Section 208. All other Erosion Control items (including Erosion Control Supervisor) will not be measured and paid for separately, but shall be included in the project Force Account for Erosion Control.

**End Revision of Section 208
Erosion Control**

**REVISION OF SECTION 209
WATERING AND DUST PALLIATIVES**

Section 209 of the Standard Specifications is hereby revised for this project as follows:

Subsection 209.07, paragraph 1 shall be deleted and replaced with the following:

Water for moisture-density control, landscaping, pre-wetting, and for dust palliatives will not be measured and paid for separately but shall be included in the cost of the work.

Subsection 209.08 shall be deleted.

**End Revision of Section 209
Watering and Dust Palliatives**

**REVISION OF SECTION 210
ADJUST MANHOLE**

Section 210 of the Standard Specifications is hereby revised for this project as follows:

Subsection 210.01 shall include the following:

This work shall consist of the adjustment of existing manholes to finish grade as depicted in the plans.

Subsection 210.10 shall be revised to include the following:

For Denver-owned manholes to be adjusted, all materials and installation shall be in accordance with the respective City & County of Denver standards. For private utility manholes, materials and installation shall be in accordance with the standards of the individual utility.

Subsection 210.13 shall include the following:

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Adjust Manhole	Each

**End Revision of Section 210
Adjust Manhole**

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**REVISION OF SECTION 210
RESET GROUND SIGN**

Section 210 of the Standard Specifications is hereby revised for this project as follows:

Subsection 210.07 shall include the following:

Where existing signs are to be removed, the existing sign post foundation shall be removed to a minimum depth of 1' below finish grade or as otherwise dictated by construction requirements. Removed foundation elements are the property of the Contractor and shall be properly disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances. Contractor shall backfill areas where existing sign post foundations have been removed with clean fill material, flow-fill, or non-shrink grout depending upon location and as directed by the Engineer.

Contractor shall restore surface areas disturbed by removal of ground signs. In grass or landscaped locations, Contractor shall reseed backfilled areas as directed by the Engineer. In sidewalks or curb ramps, new sidewalk or curb ramp shall be installed by the Contractor as directed by the Engineer. In cases where existing sidewalk or curb ramp has been damaged, disturbed or otherwise requires restoration, the entire sidewalk panel or curb ramp shall be replaced. Existing sidewalk or curb ramp materials removed by the Contractor during the course of such operations shall be disposed of by the Contractor in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Existing ground signs constructed to CDOT standards on "P" posts that are to be reset require new foundation(s) in accordance with Standard Drawing S-614-8.

Existing ground signs constructed to City & County of Denver standards on square tube posts require new foundation(s) in accordance with City Standards.

All MUTCD requirements specific to horizontal and vertical placement of the reset sign shall be met.

Subsection 210.12 shall include the following:

Reset Ground Sign shall include physical removal of the ground sign and existing foundation to a minimum depth of 1' below finish grade; disposal of non-salvageable material including removed foundations; backfill of excavated removal areas; and surface restoration of grass, landscaped, sidewalk, curb ramp or on-street areas disturbed by the removal activities.

The unit cost shall include all labor and materials required to install new sign post foundations in accordance with the referenced standards, and physical remounting of the ground sign on new foundation(s).

Subsection 210.13 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Reset Ground Sign	Each

**End Revision of Section 210
Reset Ground Sign**

**REVISION OF SECTION 212
RESTORE LANDSCAPING, SEEDING, FERTILIZER AND SODDING**

Section 212 of the Standard Specifications is hereby revised for this project as follows:

Subsection 212.01 shall include the following:

Work performed in areas under the jurisdiction of Denver Parks and Recreation Department shall conform to the standards of that Department.

This work shall also consist of restoring existing landscaping that is disturbed during construction to its original or improved condition. This item applies to all landscaping within the limits of construction. Materials used to restore landscaping shall be replaced "in-kind" unless otherwise approved by the Engineer.

Subsection 212.02 shall include the following:

Restore Landscaping "In Kind" shall include restoring all landscaping that is disturbed within the limits of construction. This includes landscape concrete and asphalt pavers, landscape rock, flowers, shrubs and landscape timbers. The Contractor shall be required to maintain the landscaping planting in accordance with Section 214.

The Contractor's attention is drawn to the Project Special Provision entitled "Denver Parks Department Specifications" for additional requirements pertaining to irrigation restoration, soil preparation, topsoil, and sodding in areas adjacent to City and County of Denver Parks. The southeast corner of the Sheridan intersection at West 25th Avenue/Byron Place is adjacent to one such Park.

Subsection 212.04 shall include the following:

At the direction of the Engineer seeding will be accepted in lieu of sodding.

Subsection 212.08 is hereby revised to include the following:

Restoration of landscaping including seeding, fertilizing and sodding within those limits outlined on the plans and/or as marked in the field by the Engineer will be paid for under the project Force Account for Landscaping. All labor and materials required to achieve landscape restoration to the satisfaction of the Engineer shall be considered included in the work.

Restoration of landscaping including seeding, fertilizing and sodding outside the limits shown in the plans and/or as marked in the field by the Engineer shall not be paid for under the project.

**REVISION OF SECTION 250
ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT**

Section 250 of the Standard Specifications is hereby revised for this project as follows:

Subsection 250.03 shall include the following:

A landfill exists at the south side of West Alameda Avenue and the South Lipan Street and South Platte River Drive intersections. A 1979 study confirmed that this landfill was a substantial methane producer. Therefore the project site at both intersections presents a potential explosion hazard and worker health and safety concern. Methane gas and other landfill gases can migrate along drains, trenches, and underground utility corridors or within natural subsurface geology up to distances over 1,500 feet.

The Contractor shall prepare a Health and Safety Plan (HASP) to be submitted either prior to, or at the Preconstruction Conference for review and approval by CDOT Environmental and Denver EQ. The HASP will need to include provisions for assessing and monitoring air quality at all utility trenches, drainage structures, and underground construction (e.g. caissons) areas prior to and during intrusive activities to ensure worker safety. The HASP shall meet all applicable safety and health regulations for construction, as promulgated in 29 CFR by the Occupational Health and Safety Administration (OSHA) and confined space requirements for general industry, as promulgated in 29 CFR 1910.046 and Appendices A-F. The cost of the HASP shall be included in the lump sum of the Environmental Health and Safety Management pay item.

The Contractor shall be responsible for the required health and safety of workers and the general public in accordance with all applicable local, state and federal regulations. The Contractor Health and Safety Officer (HSO) and/or Monitoring Technician shall be on site as necessary during subsurface activities to ensure worker safety, as detailed in CDOT Standard Specification 250 – Environmental Health and Safety Management, and this Project Special Provision. Denver EQ will also be contacted at least 48 hours prior to initiating any subsurface construction.

Subsection 250.01 shall include the following:

There is potential for encountering hazardous materials due to the presence of leaking underground storage tanks and spills in the vicinity of the project – particularly at the West Alameda Avenue and South Clay Street intersection and the Sheridan Boulevard and West 25th Avenue/West Byron Place intersection. The Contractor shall review the project's initial assessment dated October 2011, available through the Engineer, which indicated the potential for soil and groundwater contamination within the project area.

Workers shall be alert during excavations for visual and olfactory signs of contamination. If soil and/or groundwater contamination is encountered during construction activities, work shall stop immediately and the procedures outlined in CDOT Standard Specification 250 – Environmental Health and Safety Management shall be followed. Denver EQ shall also be notified in such an instance.

The Contractor shall be responsible for the required health and safety of workers and the general public. The Contractor HSO and/or Monitoring Technician shall be on site as necessary during excavation to ensure proper handling, testing and disposal of contaminated media, as detailed in CDOT Standard Specification 250, as well as Section 107.25.8 of the Standard Specifications and all applicable local, state and federal regulations. Contaminated water brought to the surface shall be contained in tanks or drums and shall not be directly discharged into a storm sewer, surface ditch or any Waters of the State. Contaminated soils shall be properly handled, tested, and disposed of. Costs associated with analytical work and material disposal shall be paid through the Environmental Health and Safety force account, as specified in Section 250.

**REVISION OF SECTION 250
ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT**

Subsection 250.09 shall include the following:

METHOD OF MEASUREMENT

All work including monitoring, sampling and handling will be paid using Environmental Health and Safety Management (Lump Sum). Material disposal and analytical costs (if necessary) will be paid by the Environmental Health and Safety Force Account.

BASIS OF PAYMENT

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Environmental Health and Safety Management	Lump Sum
Environmental Health and Safety Management	Force Account

**End Revision of Section 250
Environmental Health and Safety Management**

**REVISION OF SECTION 304
AGGREGATE BASE COURSE**

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

Subsection 304.02 shall include the following:

Materials for the base course shall be Aggregate Base Course (Class 6) as shown in Subsection 703.03.

The Aggregate Base Course (Class 6) shall meet the gradation requirements of 703.03 and shall have a resistance value (R value) of at least 78 when tested by the Hveem Stabilometer method as tested by T-190 and Colorado Procedure CP-L 3102.

Installation and placement of aggregate base course shall not be measured and paid separately but shall be included in the cost of the work.

**End Revision of Section 304
Aggregate Base Course**

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**REVISION OF SECTION 403
HOT MIX ASPHALT**

Section 403 of the Standard Specifications is hereby revised for this project as follows:

Subsection 403.02 shall include the following:

The design mix for hot mix asphalt shall conform to the following:

Table 403-1

Property	Test Method	Value for Grading		
		S(100)	SX(100)	Patching
Air Voids, % at: N initial♦, N design	CPL 5115	3.5 – 4.5	3.5 – 4.5	3.5 – 4.5
Lab Compaction (Revolutions): N initial♦, N design	CPL 5115	8 100	8 100	8 100
Stability, minimum	CPL 5106	30	30	30
Aggregate Retained on 4.75mm (No. 4) Sieve with at least two mechanically induced fracture faces, % minimum	CP 45	60	60	60
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80	80	80
Minimum Dry Split Tensile Strength kPa (psi)	CPL 5109 Method B	205 (30)	205 (30)	205 (30)
Grade Asphalt Cement, Top Layer			PG 76-28	PG 76-28
Grade Asphalt Cement, Below Top		PG 64-22		PG 64-22
Voids in the Mineral Aggregate (VMA), % minimum	CP 48	See Table 403-2	See Table 403-2	See Table 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-75	65-75	65-75
Dust to Asphalt Ratio: Fine Gradation, Coarse Gradation	CP 50	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6
♦ Item shown for information only				
Note: AI MS-2 = Asphalt Institute Manual Series 2				
Note: The current version of CPL 5115 is available from the Region Materials Engineer				
Note: Mixes with gradations having less than 40% passing the 4.75mm (no. 4) sieve shall be approached with caution due to constructability problems				
Note: Gradations for mixes with nominal maximum aggregate size of one-inch or larger are considered a coarse gradation if they pass below maximum density line at #4 screen				
Note: Gradations for mixes with nominal maximum aggregate size of ¾-inch or smaller are considered a coarse gradation if they pass below maximum density line at #8 screen				

All mix designs shall be run with a gyratory compaction angle of 1.25 degrees and properties must satisfy Table 403-1.

Form 43 will establish construction targets for Asphalt Cement and all mix properties at Air Voids up to 1.0 per cent below the mix design optimum.

The Contractor shall prepare a quality control plan outlining the steps taken to minimize segregation of HMA. This plan will be submitted to the Engineer and approved prior to beginning the paving operations. When the Engineer determined that segregation is unacceptable, the paving shall stop and the cause of segregation shall be corrected before paving operations will be allowed to resume.

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**REVISION OF SECTION 403
HOT MIX ASPHALT**

Table 403-2

Minimum Voids in the Mineral Aggregate (VMA)			
Nominal Maximum Size♦, mm (inches)	♦♦Design Air Voids♦♦		
	3.5%	4.0%	4.5%
37.5 (1½)	11.6	11.7	11.8
25.0 (1)	12.6	12.7	12.8
19.0 (¾)	13.6	13.7	13.8
12.5 (½)	14.6	14.7	14.8
9.5 (3/8)	15.6	15.7	15.8
♦ The Nominal Maximum Size is defined as one sieve larger than the first sieve to retain more than 10%. ♦♦ Interpolate specified VMA values for design air voids between those listed. ♦♦♦ Extrapolate specified VMA values for production air voids beyond those listed.			

Hot mix asphalt for patching shall conform to the gradation requirements for Hot Mix Asphalt (Grading SX) (100) (PG 76-28) for the top lift. Lower lifts may use Hot Mix Asphalt (Grading S) (100) (PG 64-22) on side streets only – lower lifts on Sheridan or Alameda shall use Hot Mix Asphalt (Grading SX) (100) (PG 76-28) for the complete depth of the section to be patched or replaced.

A minimum of 1% hydrated lime by weight of the combined aggregate shall be added to the aggregate for all hot mix asphalt.

Subsection 403.03 shall include the following:

If liquid anti-stripping additive is added at the plant, an approved in-line blender must be used. The blender shall be in the line from the storage tank to the drier drum or pugmill. The blender shall supply sufficient mixing action to thoroughly mix the asphalt cement and anti-stripping additive.

The Contractor shall construct the work such that all roadway pavement is placed prior to the time paving operations end for the year, and shall be completed to the full depth thickness required by the plans. The Contractor’s Progress Schedule shall show the methods to be used to comply with this requirement.

Delete Subsection 403.05 and replace with the following:

The accepted quantities of hot mix asphalt will be paid for in accordance with subsection 401.22, at the contract unit price per square yard for bituminous mixture at the depths indicated in the plans.

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Hot Mix Asphalt (Patching) (Asphalt)	Ton

Aggregate, asphalt recycling agent, additives, hydrated lime, and all other work necessary to complete each hot mix asphalt item will not be paid for separately, but shall be included in the unit price bid. When the pay item includes the PG binder grade, the asphalt cement will not be measured and paid separately but shall be included in the work. When the pay item does not include the PG binder grade, asphalt cement will be measured and paid in accordance with Section 411. Asphalt cement used in Hot Mix Asphalt (Patching) will not be measured and paid for separately, but shall be included in the work. Excavation, preparation, and tack coat of areas to be patched will not be measured and paid for separately, but shall be included in the work.

**End Revision of Section 403
Hot Mix Asphalt**

**REVISION OF SECTION 503
DRILLED CAISSON**

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

Subsection 503.01 shall include the following:

This work consist of drilling holes and placing concrete and reinforcing steel therein to form foundations for traffic signal poles in conformance with the plans and as directed by the Engineer.

Subsection 503.03 shall include the following:

Class BZ concrete shall be used for the traffic signal pole foundation. 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.

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.

Subsection 503.08 shall include the following:

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 Caissons. All labor and ancillary materials required for the installation are considered included in the unit cost.

Items also included in the unit price for the foundation include raking and/or plumbing of the poles after loading; and all required grouting.

Subsection 503.09 shall include the following:

For all traffic signal poles requiring a 36" drilled caisson, measurement and payment shall be in accordance with the Standard Specifications. For all traffic signal poles requiring a 24" precast footing, cost of the foundation shall be considered included in the unit cost for furnish and installation of the pole and will not be measured and paid separately.

**End Revision of Section 503
Drilled Caisson**

**REVISION OF SECTIONS 601, 606, 608 AND 609
CONCRETE FINISHING**

Sections 601, 606, 608 and 609 of the Standard Specifications are hereby revised for this project as follows:

Subsection 601.12 (a) shall include the following:

The finishing of hardened concrete surfaces shall not require a certified Concrete Flatwork Finisher as described in subsection 610.12(a).

Subsection 606.04(a), second paragraph shall include the following:

When hand finishing is allowed, it shall be performed under the supervision of a certified Concrete Flatwork Finisher in conformance with revised subsection 601.12(a).

Subsection 606.04(b), first paragraph shall include the following:

All required hand finishing shall be performed under the supervision of a certified Concrete Flatwork Finisher in conformance with revised subsection 601.12(a).

Subsection 608.03(d), first paragraph shall include the following:

All required hand finishing shall be performed under the supervision of a certified Concrete Flatwork Finisher in conformance with revised subsection 601.12(a).

Subsection 609.03 shall include the following:

All required hand finishing shall be performed under the supervision of a certified Concrete Flatwork Finisher in conformance with revised subsection 601.12(a).

**End Revision of Sections 601, 606, 608 and 609
Concrete Finishing**

**REVISION OF SECTION 603
CULVERTS AND SEWERS**

Section 603 of the Standard Specifications is hereby revised for this project as follows:

Subsection 603.01 shall include the following:

All Reinforced Concrete Pipe provided for this project shall be Class III Pipe (Reinforced) unless stated differently on the plans.

Contractor shall use rubber gaskets for the installation of Reinforced Concrete Pipe. The rubber gasketed joints shall conform to the requirements of ASTM C 443M (ASTM C 443) and shall be flexible, and able to withstand expansion, contraction, and settlement.

All rubber gaskets shall be stored in a cool a location as practicable, preferably at 70 degrees Fahrenheit or less.

Where required, the work shall include the construction of sanitary sewer encasements as directed by the Engineer.

Subsections 603.03 through 603.11 shall be replaced with the City and County of Denver (CCD) Department of Public Works document entitled, "Storm Drainage and Sanitary Sewer Construction Details and Technical Specifications." This document can be found at the following web address: <http://denvergov.org/tabid/436483/Default.aspx>.

Where trenching shoring is required, the Contractor shall ensure that the shoring method and design will support all adjacent traffic loads.

Section 5.0.3.2 of the CCD document titled, "Backfilling Methods" is hereby revised to include the following: "*All backfill within the roadway section shall be Method B.*"

In Subsection 603.12, delete the second paragraph and replace with the following:

Structure excavation, backfill and material/compaction testing for Reinforced Concrete Pipe will not be measured and paid for separately, but shall be included in the work.

Subsection 603.12 shall include the following:

The cost of sanitary sewer encasements shall not be paid for separately but shall be considered included in the work.

**End Revision of Section 603
Culverts and Sewers**

**REVISION OF SECTION 604
MANHOLES, INLETS AND METER VAULTS**

Section 604 of the Standard Specifications is hereby revised for this project as follows:

Subsections 604.02 through 604.06 shall be replaced with the City & County of Denver (CCD) Department of Public Works document titled, "Storm Drainage and Sanitary Sewer Construction Details and Technical Specifications." This document can be found at the following web address: <http://denvergov.org/tabid/436483/Default.aspx>. Delete all references in this document to measurement and payment and item numbers referencing CCD's Standard Construction Specifications.

Subsection 604.06 shall include the following:

The use of precast inlets and manholes may require an increase in the structure size denoted on the plans. The cost associated with and increase in structure size due to the use of precast structures will be at the Contractor's expense.

Subsection 604.07 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Inlet Type R L 5 (10 Foot)	Each
Inlet Type 16 Double (5 Foot)	Each

Structure Excavation and Structure Backfill will not be measured and paid separately but shall be included in the work.

Curb inlets shall conform to CCD Department of Public Works, Wastewater Management Division, Standard Details 2010. This document can be found at the following web address: <http://denvergov.org/tabid/436483/Default.aspx>.

**End Revision of Section 604
Manholes, Inlets and Meter Vaults**

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

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

The Contractor shall protect all new concrete items built under this Contract from 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.

Finished surfaces adjacent to paving work shall be adequately protected from soiling, staining and other damage.

Subsection 608.03(e) shall include the following:

All joints except expansion joints shall be completely filled with mortar. Mortar grout between granite pavers shall be uniform in appearance, texture and color. After initial set of mortar, joints shall be finished by tooling with round, non-staining jointer to produce glossy-hard, polished, slightly concave joint, free of drying cracks. Upon completion of granite paving, surfaces shall be left in a clean, unsoiled condition, to be approved by the Engineer.

Subsection 608.03(f) shall be revised to include the following:

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

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.

Add the following to Subsection 608.03:

- a. *Adjust, Clean and Seal.* Remove and replace granite pieces that are broken, chipped, stained or otherwise damaged. Remove and replace new units which are misaligned or not to grade or do not match adjoining granite work. Provide new matching units, install as specified and fill joints to eliminate evidence of replacement. Repair defective and unsatisfactory joints as required to provide a neat, uniform appearance.

Exposed surfaces shall be kept free from mortar at all times. Any mortar smears shall be immediately removed with clean sponge and clean water before latex modified mortar can set. Wash areas of granite clean of excess grout. Clean granite work after completion of work, using clean water and stiff-bristle brushes. Do not use wire brushes, acid type cleaning agents or other cleaning compounds with caustic or harsh fillers. Apply penetrating sealant in strict accordance with manufacturer's recommendations.

- (h) *Protection.* All completed or in progress work shall be protected at all times during construction. Use a strong impervious film or fabric to securely cover granite.
- (i) *Paving in Cold Weather.* Remove any ice or snow formed on granite or concrete sub-slab by carefully applying heat until top surface is dry to touch. Remove granite work determined to be damaged by freezing conditions. Do not use frozen materials or materials mixed or coated with ice or frost. Do not lower the freezing point of mortar by use of admixtures or antifreeze agents. Do not use calcium chloride in mortar mixture or grout.

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

During all seasons, protect partially completed granite work against weather when work is not in progress, by a system approved by Engineer. Work shall not be left unprotected when air temperature falls below 50 degrees F.

Subsection 608.06 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Concrete Sidewalk	Square Yard
Concrete Curb Ramp	Square Yard
Truncated Domes	Square Foot

All work necessary and incidental to the construction of Concrete Sidewalk and Concrete Curb Ramp, including bed course material, will not be measured and paid separately but shall be included in the work. 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 the plans. Reconditioning, forms, finishing, backfill and curing will be in accordance with the plans and specifications and will not be paid for separately.

Detectable warnings (truncated domes) shall be considered included in the unit cost of concrete curb ramps in all locations where new corner curb ramps are to be installed. Truncated domes shall only be measured and paid for separately for those corner ramps which are to remain. In this project, only the west ramps at the Sheridan Boulevard intersection at 25th Avenue/Byron Place are to remain and are to have new truncated domes installed. Therefore, at the 25th Avenue/Byron Place location, detectable warnings (truncated domes) on curb ramps, including all work and materials necessary for fabrication, transport, surface preparation and installation will be measured and paid by the square foot.

Excavation to proposed subgrade elevation will not be paid for separately but shall be included in the work associated with Section 202, Removal of Structures and Obstructions.

**End Revision of Section 608
Sidewalks and Curb Ramps**

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**REVISION OF SECTION 609
CURB AND GUTTER**

Section 609 of the Standard Specifications is hereby revised for this project as follows:

Subsection 609.02 shall be revised as follows:

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

In Subsection 609.02, the second paragraph shall be deleted and replaced with the following:

Concrete shall conform to the requirements of Class "P" concrete 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.

Subsection 609.03(a) shall include the following:

Excavation shall conform to the requirements of the revisions to subsections 608.03 (Sidewalks and Bikeways).

Subsection 609.03(b) shall include the following:

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 project. 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 cost to the project.

Subsection 609.03(c) shall 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) shall include the following:

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.

Subsection 609.03(f) shall include the following:

The Contractor shall ensure 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" require removal and replacement of such items at the Contractor's expense.

Subsection 609.07 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Curb and Gutter Type 2 (Section I-B)	Linear Foot
Curb and Gutter Type 2 (Section II-B)	Linear Foot
Gutter Type 2 (10 Foot)	Linear Foot

**REVISION OF SECTION 609
CURB AND GUTTER**

Excavation to proposed subgrade elevation will not be paid for separately but shall be included in the work associated with Section 202, Removal of Structures and Obstructions.

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

**End Revision of Section 609
Curb and Gutter**

**REVISION OF SECTION 612
DELINEATORS**

Section 612 of the Standard Specifications is hereby revised for this project as follows:

Subsection 612.03 shall include the following:

Contractor shall remove and dispose of all delineators identified for replacement as shown in the plans. Removed delineators are the property of the Contractor and shall be properly disposed of in accordance with the Standard Specifications, as well as in accordance with applicable laws and ordinances.

Subsection 612.04 shall include the following:

Removal of existing delineators will not be measured and paid for separately, but will be considered included in the unit cost for new delineators.

**End Revision of Section 612
Delineators**

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**REVISION OF SECTION 613
ELECTRICAL CONDUIT**

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

Subsection 613.01 shall include the following:

This work includes furnishing and installing new High Density Polyethylene (HDPE) or Polyvinyl Chloride (PVC) electrical conduit, some of which will be used with fiber optic cable. All materials furnished, assembled, fabricated, or installed under this item shall be new, corrosion resistant, and in strict accordance with the plan sheets and these Technical Specifications.

Conduit shall be installed by trenching or directional boring methods. Directional boring shall be allowed project-wide at the Contractor's option and with the Engineer's approval. Trenching shall not be allowed in areas identified for directional boring, if so designated in the plans.

Subsection 613.02 shall include the following:

All conduits shall be Schedule 80 in the diameters, quantities and depths indicated in the plans and shall be compliant with all applicable ASTM requirements. Bored electrical conduit shall be HDPE and installed using a trench-less technology such as directional boring. Non-bored electrical conduit shall be PVC or HDPE and installed by direct burial methods such as plowing, open trenching, or other approved excavation methods.

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

All HDPE conduit shall be factory lubricated, low-friction, high-density conduit constructed of virgin high-density polyethylene resin. HDPE conduit shall be capable of being coiled on reels in continuous lengths, transported, stored outdoors, and subsequently used for installation, without affecting its properties or performance.

The coefficient of friction on the internal walls of the conduit shall not exceed 0.15 when pulling cable.

Each individual conduit shall be equipped with either a pull rope or a pull tape, depending upon the length between pull boxes as follows:

1. Each conduit with a segment than 400' between pull boxes shall be equipped with a pull tape in the final product. The pull tape shall have a minimum tensile strength of 1250lbs and be of a design and manufacture that prevents cutting or burning into the conduit during cable installation.
2. Each conduit with a length of less than 400' between pull boxes shall be equipped with a pull rope in the final product. The pull rope shall have a minimum tensile strength of 1250lbs.

The Contractor shall have the option of using pull tape in all conduit installations regardless of length. Splices in the pull tape, pull rope and tracer wire shall not be permitted.

Subsection 613.07 shall include the following:

All conduit installation shall conform to guidelines of the National Electric Code (NEC).

Conduit shall always enter a pull box, manhole, cabinet base or any other type structure from the direction of the run only.

**REVISION OF SECTION 613
ELECTRICAL CONDUIT**

Excavations and conduit installation shall be performed in a continuous operation. Excavation shall not be performed until immediately prior to installation of conduits. All trenches shall be backfilled by the end of a work shift. Material from trenching operations shall be placed in a location that will not cause damage or obstruction to vehicular, bicycle or pedestrian traffic or interfere with surface drainage.

The Contractor shall take all necessary precautions to avoid over-excavating a trench or heaving damage to the existing asphalt or concrete mat, whether caused by equipment directly or by dislodging of rocks or boulders. Any such over-excavation or heaving shall be repaired or replaced at the Contractor's expense. The Contractor shall bear the cost of backfilling all over-excavated areas with the appropriate backfill material as approved by the Engineer.

The Contractor shall restore all surface materials to their preconstruction condition or better, including but not limited to pavement, sidewalks, curb ramps, sprinkler systems, landscaping, shrubs, sod grass, or native growth vegetation that is disturbed by the conduit installation operation. All such surface restoration shall be considered included in the cost of conduit installation and will not be measured and paid for separately.

The Contractor shall use splice couplings if a boring varies from the access points depicted in the plans. All associated work to splice the conduit shall be included in the cost of the item. The coupling technology used to connect the conduit ends shall require no special tools and form a watertight and airtight seal. The breaking force between segments shall exceed 250lbs of force. No metal fittings shall be allowed. No elevation difference between the conduit run and the splice location will be allowed. Conduit splices shall be kept to a minimum and all splice locations shall be approved by the Engineer. Additional pull boxes shall not be substituted for splices without prior authorization of the Engineer.

Conduit plugs shall be supplied and installed in all interconnect conduit ends as soon as the conduit is installed. Interconnect conduit shall be plugged at all termination points such as pull boxes, manholes, controller cabinets and node buildings. Interconnect conduits containing cable shall be plugged with durable and reusable split type plugs, fabricated without metallic parts that allow easy removal and reinstallation around in-place cables. Split type plugs shall provide a watertight and airtight seal of at least 22psi. They shall be installable by hand without using special tools and without damaging the cable. All plugs shall be correctly sized to fit the conduit being plugged. Empty conduits shall be sealed with removable mechanical type duct plugs that are watertight and equipped with a rope tie on the inside end for connection of the pull rope/tape.

Conduits shall use sweeps to elevate buried conduits to final grade within a pull box or manhole as shown in the plans. Sweeps shall be terminated within pull boxes and manholes to allow for easy installation and removal of conduit plugs. Sweeps shall be set above the ground surface within the pull box at a height that does not interfere with coiling of cables.

All conduit runs for fiber optic cable shall have a limited number of bends. The sum of the individual conduit bends, both horizontal and vertical, on a single conduit run between any two pull boxes shall not exceed 360°. The preferred limit is 270°. No individual bend shall exceed 90°.

If trenching is used, all off-street trenches shall be backfilled 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 backfilled with CDOT approved structure backfill (Flow-Fill) and capped with 9" minimum of Hot Mix Asphalt Pavement (Patching) in accordance with Section 403 and Denver Street Cut Regulations if applicable. If surrounding pavement depth is greater than 9 inches, the HMA (Patching) depth shall match the existing pavement.

**REVISION OF SECTION 613
ELECTRICAL CONDUIT**

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

If new conduits are installed in existing pull boxes, manholes or cabinet bases the Contractor shall carefully excavate around them and install the new conduit as shown in the plans, and in a manner meeting the requirements of this Project Special Provision. The Contractor shall not damage the existing pull box, manhole, cabinet or the contents thereof. If the existing pull box, manhole or cabinet base is cracked or damaged during conduit installation, the Contractor shall restore the damaged item to preconstruction condition at no additional cost to the project. Damage to existing pull boxes shall include broken or cracked lids.

Subsection 613.11 shall include the following:

Electrical Conduit shall be measured by the actual linear foot of conduit installed and accepted and shall include all groundwork, lubricants, anchors, bands, skids, sweeps, pull rope, pull tape, copper tracer wire, adaptors, fittings, conduit plugs, foam sealant, installation equipment, splice couplings, mounting brackets and hardware, structure anchors, adhesives, labor, and all other items necessary to complete the work.

The cost of all Type A (electrical and/or street lighting) and Type B (traffic signal wiring) pull boxes as may be required or as depicted in the plans shall be considered included in the unit cost for electrical conduit. Type C pull boxes will be measured and paid separately.

Surface restoration shall be considered included in the unit price for this item and will not be measured and paid separately.

All new conduits shall be trenched or directionally bored at the Contractor's option. All new conduits shall be measured and paid as Electrical Conduit (Plastic) regardless of installation method.

Subsection 613.12 shall include the following:

Electrical Conduit unit prices shall be full compensation for the work shown in the plans and described above; complete and in place.

Payment will be made under:

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

**End Revision of Section 613
Electrical Conduit**

**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 street light, 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 and 75' WEST THEN TO HIGHWAY SIGN	FEEDS FROM XFMR 250' SOUTH AND EAST 200' WEST
---------------------------------------------------------------------	-----------------------------------------------------

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

<i>Manufacturers</i>	<i>Catalog Numbers</i>
Uticom Systems Inc.	U5025Y1
Panduit	
3M	
Or approved equal	

Subsection 613.11 shall include the following:

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

**End Revision of Section 613
Electrical Conductor Identification**

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**REVISION OF SECTION 613
PULL BOXES**

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

Subsection 613.02 shall include the following:

Pull box materials and installation shall be in accordance with the City & County of Denver Project Specials, Drawing No. 16.1.7.

Pull boxes shall be made of fiberglass-reinforced polymer concrete designed to support a minimum service load of 20,000 pounds over a 10" x 10" square. Pull boxes shall have a detachable cover that has a skid-resistant surface. The cover 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. Non-standard bolts shall not be used.

Type A pull box covers shall have the word "ELECTRIC" physically impressed (not painted) on top. Type B pull box covers shall have the word "TRAFFIC" physically impressed (not painted) on top. Type C pull box covers shall have the words "TRAFFIC COMM" physically impressed (not painted) on top.

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 loading. 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.

Subsection 613.07 shall include the following:

At some intersections, existing pull boxes and conduits may need to be modified to accommodate minimum bend requirements of interconnect cable and/or splice closures. As shown in the plans or as directed by the Engineer, the Contractor shall remove existing pull boxes and replace with a new pull box having dimensions as listed in the plans or herein. Replacement of such boxes will be paid at the unit price for new pull boxes.

Subsection 613.11 shall include the following:

Pull boxes shall include installation of new pull box, modification of conduit ends if required, and all excavation, backfill and surface restoration.

The unit price shall include the removal and replacement of existing surface materials in-kind to match existing grade and pre-construction condition – including landscaped areas. All other labor and materials necessary to complete the item are included. Seeding, mulching and associated items required for landscape restoration around individual pull boxes shall be considered included in the unit price for this item and will not be measured and paid separately.

Type and location of pull boxes shall be as shown and tabulated in the plans; measured and paid for by the number of actual pull boxes installed and accepted.

Pull boxes identified as Type A in the City & County of Denver Traffic Project Specials are intended for the use of Xcel Energy for electrical or street lighting purposes. All such pull boxes shall be considered included in the unit cost for electrical conduit and will not be measured and paid separately. Pull boxes identified as Type B in the City & County of Denver Traffic Project Specials are intended for use of the City & County of Denver for traffic signal wiring purposes. All such pull boxes shall be considered included in the unit cost for electrical conduit and will not be measured and paid separately.

**REVISION OF SECTION 613
PULL BOXES**

Pull boxes identified as Type C in the City & County of Denver Project Specials are intended for signal system communications. All such pull boxes shall be measured and paid as Pull Box (Special), by the number each, installed and accepted.

Subsection 613.12 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Pull Box (Special)	Each

**End Revision of Section 613
Pull Boxes**

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**REVISION OF SECTION 613
LIGHTING**

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

Subsection 613.02 shall include the following:

Highway lighting materials and equipment for installation and modifications shall be compatible or interchangeable with standard materials and equipment as stocked by XCEL Energy. Luminaires shall be high pressure sodium, 250 Watt fixtures. Luminaires shall be furnished and installed on top of every new traffic signal-light pole included in the project.

Lighting materials and equipment that are compatible with that stocked by XCEL Energy are as follows:

<i>Manufacturer</i>	<i>Catalog Numbers</i>
Gardco	CA2213120250HPSFGPPC1069 Mast Arm Fitter
Kim Lighting	CCS25A3/250HPS120/FG-P/A-25MAF
Sterner	FTA25A103HP250S120NS-RF2

Contractor shall submit a lighting materials list to XCEL for approval prior to ordering. Contact Steve Smith at 303-571-3945. Copy the Engineer on all such correspondence.

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:

Luminaires of the type specified shall not be measured and paid for separately but shall be considered included in the unit cost for traffic signal poles.

**End Revision of Section 613
Lighting**

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

Section 613 of the Standard Specifications shall include the following:

Subsection 613.01 shall include the following:

This work shall consist of furnish and installation of an electric meter pedestal cabinet and base. Cabinets shall be offset a minimum of 6 feet from any roadway and 5 feet from the controller cabinet, service pole or pad-mounted transformer. XCEL Energy will furnish and install the electric meter.

Subsection 613.03 shall include the following:

Materials and installation shall conform to the City & County of Denver Project Specials, Drawings No 16.1.19 and 16.1.20. Contractor shall furnish and install the electric meter pedestal cabinet and base, with work to be provided by a licensed electrician (journeyman) at the locations shown in the plans. Installation shall be in accordance with the Project Specials, the Project Special Provisions and as directed by the Engineer.

Meter pedestal shall be UL listed "Industrial Control Panel" per UL 508 and shall meet the Electric Utility Service Equipment Requirements Committee (EUSERC) guidelines. Construction shall be NEMA 3R and 12, rain-tight and dust-tight, electrically welded and reinforced where required. All nuts, bolts, screws and hinges shall be stainless steel; and not visible from the exterior of the meter pedestal. Phenolic name plates shall be removed as required. Circuit breakers shall be cable in – cable out with line on top and load on the bottom. Handle position up = "On," middle = "Tripped," and Down = "Off." A plastic covered wiring diagram shall be attached to the inside of the front door. Meter pedestal shall be factory wired and conform to applicable NEMA Standards.

Subsection 613.11 shall include the following:

Electric Meter Pedestal Cabinet and Base shall be measured by the number each installed and accepted. The unit cost shall include groundwork, sweeps, pull cord, copper tracer wire, adapters, fittings, splice couplings, conduit plugs, equipment, labor, and all other items necessary to complete the work. The concrete pedestal base, including concrete foundation, excavation, backfill, concrete and anchor bolts, complete in place, shall be considered incidental to the item and will not be measured and paid separately.

Subsection 613.12 shall include the following:

Subsection 613.12 shall include the following:

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

**End Revision of Section 613
Electric Meter Pedestal Cabinet and Base**

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REVISION OF SECTION 614
STEEL SIGN POST

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

Subsection 614.02 shall include the following:

New sign posts for this project shall consist of square, perforated welded steel tubing with perforations or knockouts on all four sides to mount signs back-to-back and on adjacent sides. The tubing shall permit sections of different sizes to telescope into the next larger size to allow adjustment, reinforcement and splicing. Compatible fittings, accessories, nuts and bolts shall be used for installation.

Sign pots shall allow installation by hand or power, sign mounting before installation, four-sided sign mounting at any height, efficient replacement of damaged sign posts, reusable materials, and FHWA-approved yielding breakaway capability in compliance with AASHTO specifications.

Sign posts shall be galvanized conforming to ASTM specification A-653 des. G-90. Corner weld shall be zinc coated after scarfing operation. Die cut posts shall be in-line galvanized per AASHTO M-120. All galvanized components shall receive a conversion coating and a clear organic polymer topcoat.

Additional requirements are as follows:

Tube Size	Wall Thickness	Area	Wt./Ft	I	s	R
Inches	Nominal/Decimal	Sq. In.	Lb.	In ⁴	In ³	In
2 x 2	14 (0,083)	14 (0.083)	1.99	0.296	0.296	0.790

Subsection 614.09 shall include the following:

Installation shall be in accordance with City & County of Denver sign installation standards. Contractor shall provide product cut sheets to the Engineer for City approval prior to ordering new sign posts.

Subsection 614.13 shall include the following:

Steel Sign Post shall include furnish and installation of the post in accordance with City & County of Denver Standard Drawings. Work shall include all required excavation, new footings, backfilling and surface restoration of grass, landscaped, sidewalk, curb ramp or on-street areas disturbed by the installation.

Subsection 614.14 shall include the following:

Pay Item
 Steel Sign Post (2" x 2" Tubing)

Pay Unit
 Linear Feet

End Revision of Section 614
Steel Sign Post

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)**

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 the complete installation of a Traffic Signal Controller and Cabinet assembly, malfunction management units (MMU), vehicle detector amplifiers (if loop detection is specified), uninterrupted power supply (UPS), other ancillary hardware, and traffic signal cabinet base per City and County of Denver standards. All materials and labor required to install a complete operating cabinet shall be supplied. Contractor shall be responsible for transport of item to the project site.

New P-size controller cabinet assemblies shall be furnished by the City to include controller, MMU, UPS and new Ethernet Switch. Controller cabinet base shall also be furnished by the City and installed by the Contractor as part of the requirements of this pay item. The integrated UPS unit provided with the cabinet will comply with City and County of Denver standards for such units.

Contact Chris Lillie at 720-865-4066 for cabinet assembly requirements and all other necessary auxiliary hardware; and to schedule equipment pick-up times.

Locations at which new cabinets and/or controllers are to be installed include the following:

1. Alameda Avenue and Clay Street
2. Alameda Avenue and Lipan Street
3. Alameda Avenue and Platte River Drive
4. Sheridan Boulevard and US-285 Northbound Ramps (South Intersection)
5. Sheridan Boulevard and US-285 Southbound Ramps (North Intersection)
6. Sheridan Boulevard and 25th Avenue/Byron Place

Subsection 614.10 shall include the following:

Contractor shall demonstrate successful traffic signal operations at all new controller and cabinet locations to the satisfaction of the Engineer or the Engineer's designee prior to acceptance of this item. The Contractor shall contact the Engineer or the Engineer's designee three (3) days before scheduled cabinet switch-on. 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 provided to the Contractor by the City and County of Denver.

All new wiring shall conform to City and County of Denver and International Municipal Signal Association (IMSA) specifications.

Location of new cabinets shall be field-verified by the Engineer before installation activities begin.

All work required to provide intersection wiring in accordance with National Electric Code (NEC) requirements is considered included in the unit price for this item.

A. Intersection Wiring

As part of the unit price for this item, Contractor shall establish or re-establish all required wiring and/or wiring connections required for successful operation of the controller and cabinet assembly in accordance with the NEC. This shall include all wiring and/or wiring connections between in-cabinet components as well as those between the cabinet and field equipment including but not limited to signal heads, push buttons, detectors, and emergency vehicle preemption detectors.

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)**

Conductors shall be permanently identified as to function. Identification shall be placed on each conductor, or each group of conductors comprising a signal phase, in each pull box and near the end of terminated conductors. Identification shall be by bands fastened to conductors in such a manner that they will not move along the conductor.

Grounds and bonding wire, straps and electrodes shall conform to NEC Article 250. Wiring and splices shall conform to applicable NEC Articles. Wiring in cabinets, hand-holes and junction boxes shall be neatly arranged and laced. Conductors shall be stranded, tinned copper wire, rated at 600 volts and individually insulated with heat stabilized polyethylene. Conductors and cables shall conform to International Municipal Signal Association (IMSA) Specification 19-1.

Metallic cable sheaths, conduit, metal poles and pedestals shall be made mechanically and electrically secure to form a continuous system and shall be effectively grounded. Bonding and grounding jumpers shall be a bare copper wire or copper strap of the same cross-sectional area, No. 8 AWG, for all systems.

Sheath for detectors shall be grounded in the controller cabinet only. The other end of the sheath shall be taped and left ungrounded.

Bonding of poles and pedestals shall be by means of connecting to the ground rod a bonding strap attached to anchor bolt or a 3/16-inch or larger brass or bronze bolt installed in lower portion of the shaft.

The ground terminal of each controller shall be connected to the ground rod with a No. 8 AWG bare copper wire with an approved ground rod clamp.

A ground electrode shall be installed at each controller cabinet. Each ground electrode shall be a one-piece copper-weld rod of 5/8-inch diameter and eight (8) feet in length, driven to a depth of at least 8 feet below the surface of the ground (flush with ground or top of cabinet base).

Splices shall be made in hand-holes or cabinets. No splices shall be allowed in pull boxes or conduits. Method shall be as approved by the City & County of Denver.

Sufficient numbers of signal head conductors shall be provided to perform functional operation of the signal. Additional conductors for electrical service or interconnect shall be as noted herein or in the plans. Signal head conductors shall conform to the red-yellow-green color sequencing with different colored tracers for each phase provided. Three (3) spare conductors shall be provided throughout the signal head circuit. All signal head conductors shall have individual terminal lugs for connection to terminal strips in the cabinet.

When conductors and cables are pulled into conduit, ends of said cables and conductors shall be taped to exclude moisture and shall be so kept until splices are made or terminal appliances attached. Ends of spare conductors shall be taped to exclude moisture. Powdered soapstone, talc, or other approved lubricant shall be used in placing conductors in conduit.

A ¼-inch nylon pull rope shall be installed in all new conduit and all existing conduit where a cable is added or an existing cable is replaced. At least 2 feet of pull rope shall be doubled back into the conduit at each termination.

Five (5) feet of slack shall be left for each conductor at each support pole and 2 feet of slack at each pull box containing cable connections.

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)**

Multi-conductor cable shall be spliced and insulated to provide a watertight joint to prevent absorption of moisture by the cable.

All required wiring shall be performed in a neat and workmanlike manner. Wiring shall be routed to match existing cabinet wiring and fix to existing cabling or the cabinet chassis using wire ties or other approved connectors.

All new wiring shall conform to International Municipal Signal Association (IMSA) standards.

B. Intersection Power

For the all signals included in this project, intersection power shall be accomplished using the new power sources. Location will be determined by XCEL Energy.

Contractor shall install new service wiring in new conduit from proposed power source to new cabinet(s) as per NEC requirements.

After the power connection has been provided to the new cabinet, the Contractor shall remove unnecessary service wiring between the power source pull box or power pole and the cabinet to be removed. All required power-down activities shall be scheduled and coordinated with the City & County of Denver at least two (2) business days prior to intended shut down. Final power connection shall be accomplished by XCEL Energy forces.

C. Other General Requirements

New cabinet locations shall be field verified by the Engineer prior to beginning installation of new cabinet foundation. Contact the Engineer to schedule field meeting(s) with the appropriate City personnel.

Each controller and cabinet assembly shall be tested as a complete entity under signal loads for a minimum of 48 hours. Each assembly shall be delivered with a signed document detailing the cabinet final test performed. The cabinet shall be assembled and tested by the controller manufacturer or authorized local distributor to ensure proper component integration and operation.

Initial activation shall be between the hours of 9:00am and 2:00pm on a weekday unless otherwise requested or authorized by the Engineer. Prior to final turn-on, all intersection equipment shall be installed and operable including but not limited to signal heads, pedestrian heads, pedestrian push buttons, vehicle detectors and emergency vehicle preemption equipment; unless otherwise authorized by the Engineer. Contractor shall notify Engineer a minimum of 2 business days prior to intended activation, such that City representatives may be present at turn-on.

Activation shall be accomplished only after all traffic signal circuits have been successfully tested to the satisfaction of the Engineer.

D. Cabinet Foundation Contractor shall install a new City-provided prefabricated cabinet foundation, sized to accommodate base-mounted NEMA size P cabinet. Installation of cabinet foundation shall be considered included in the unit cost for installation of the cabinet and controller.

E. UPS Assembly

UPS assembly shall be provided with the cabinet. See the stand-alone project special provision for equipment specification and installation requirements.

**REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)**

F. *Managed Ethernet Switch*

Managed Ethernet switch shall be provided with the cabinet. See the stand-alone project special provision for equipment specification and installation requirements. Note that installation of this item is included in the stand-alone pay item for Telemetry (Field).

G. *Malfunction Management Unit (MMU)*

MMU shall be provided with the cabinet. Labor and materials required to install the unit in the field cabinets and provide any required wiring connections and/or programming shall be provided by the Contractor as a part of this pay item.

Section 614.13 shall include the following:

Installation of new controller and cabinet assemblies shall be measured and paid by the number of intersections at which the described work is undertaken; paid for as Traffic Signal Controller and Cabinet (Install Only). The unit price shall include all labor, materials, ancillary hardware, wiring, and wiring re-connection (including XCEL Energy power feed) required to provide successful operation of the item. The unit price shall include all transportation costs; and all labor, materials and ancillary hardware required to test and program the item.

Removal and disposal of existing cabinets shall be in accordance with the Project Special Provision for Removal of Traffic Signal Equipment.

Work shall include all required internal cabinet work and establishing all required wiring connections. Work shall include establishing or re-establishing all required intersection wiring in accordance with the NEC.

For all new cabinets, all labor and materials required to install, connect, program, initialize and test the City-furnished UPS Assembly and MMU shall be included in the cost to install the new cabinet and controller assembly.

Note that for all existing signal locations in this project, signal communications work is required and will be paid under the stand-alone pay item for Telemetry (Field). The Telemetry (Field) pay item will include installation of the City-provided Managed Ethernet Switch.

Installation of prefabricated foundation is required for all new cabinets. Installation of foundation in accordance with the plans shall be considered included in the unit price for installation of the cabinet and controller; and shall not be measured and paid separately. Work shall include foundation installation, all required conduit modification work, excavation, backfilling, concrete repair and other surface restoration.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Traffic Signal Controller and Cabinet (Install Only)	Each

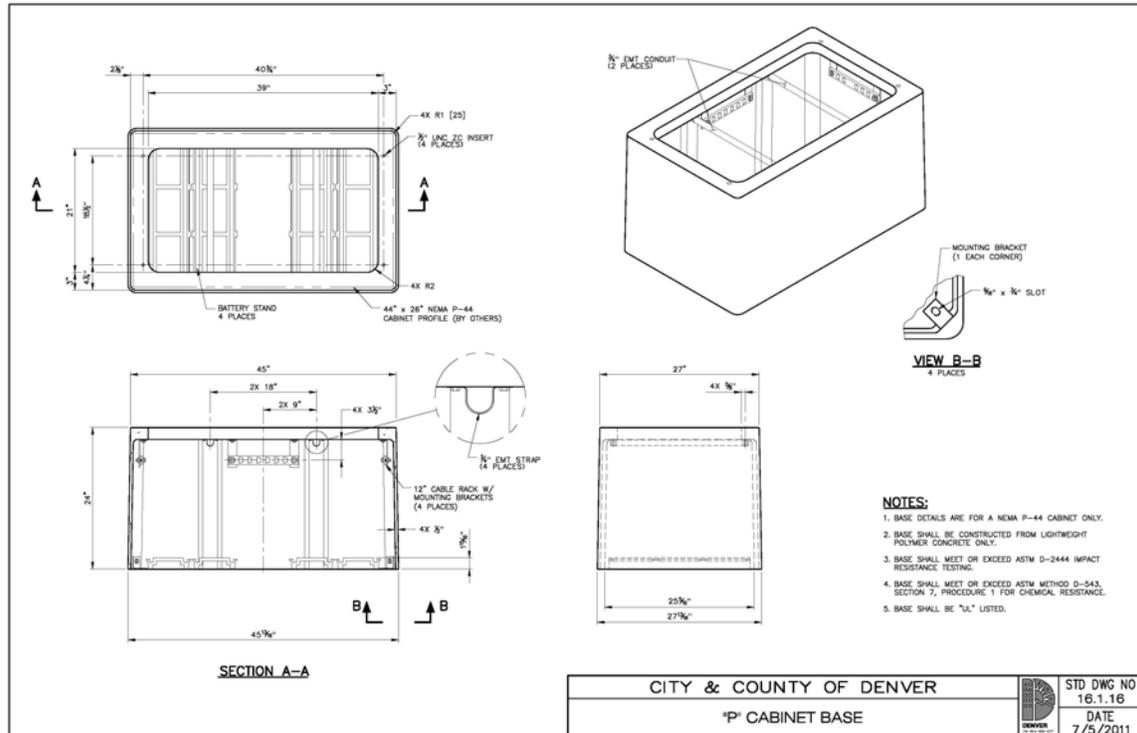
**End Revision of Section 614
Traffic Signal Controller and Cabinet (Install Only)**

-1-
REVISION OF SECTION 614
TRAFFIC SIGNAL CABINET BASE (INSTALL ONLY)

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 installing a composite Traffic Signal Controller Cabinet Base as shown in the plans and in accordance with City & County of Denver standards. The base shall be furnished by the City & County of Denver and fit the P-size traffic signal controller cabinet also to be furnished by the City. Dimensions are as shown in the following drawing:



Contractor shall pick up the item from the City & County of Denver maintenance facility at 5440 Roslyn Street, Denver and transport it to the site. Contact Chris Lillie at 720-865-4066 to schedule pick-up.

Subsection 614.10 shall include the following:

Prior to starting cabinet base installation, Contractor shall obtain field verification of the location of the cabinet from the Engineer or the 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.

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.

**REVISION OF SECTION 614
TRAFFIC SIGNAL CABINET BASE (INSTALL ONLY)**

Subsection 614.14 shall include the following:

Installation of the City-furnished traffic signal cabinet base will not be paid for separately, but shall be included in the cost of the Traffic Signal Controller and Cabinet installation.

**End Revision of Section 614
Traffic Signal Cabinet Base (Install Only)**

**REVISION OF SECTION 614
ETHERNET MANAGED FIELD SWITCH (INSTALL ONLY)**

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, to be furnished by CCD, in the CCD controller cabinets.

Contractor shall pick up the item from the City & County of Denver maintenance facility at 5440 Roslyn Street, Denver and transport it to the site. Contact Chris Lillie at 720-865-4066 to schedule pick-up.

Subsection 614.13 shall include the following:

Ethernet Managed Field Switch installation will not be measured but shall be included in the Contractor's unit cost for Telemetry (Field). Work shall include wiring to establish required connections and related labor and materials required for the completion of the installation.

Subsection 614.14 shall include the following:

Ethernet Managed Field Switch installation will not be paid for separately, but shall be included in the Contractor's unit cost for Telemetry (Field).

**End Revision of Section 614
Ethernet Managed Field Switch (Install Only)**

**REVISION OF SECTION 614
UNINTERRUPTED POWER SUPPLY (UPS) SYSTEM (INSTALL ONLY)**

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 installing an Uninterrupted Power Supply (UPS) system, to be furnished by CCD, in the CCD-owned controller cabinets. All materials and labor required to install a complete and functional in-cabinet installation shall be supplied. UPS shall fit into the bottom of the proposed P-size traffic signal cabinet.

Contractor shall pick up the item from the City & County of Denver maintenance facility at 5440 Roslyn Street, Denver and transport it to the site. Contact Chris Lillie at 720-865-4066 to schedule pick-up.

Contractor shall provide all labor and materials required for successful operation; and demonstrate successful UPS system operations to the satisfaction of the Engineer prior to acceptance of cabinet item. All transportation and administrative costs associated with the UPS are included in the unit price for the cabinet and will not be measured and paid separately. Work shall include all required hardware components and all required wiring and physical connections to achieve accordance with the NEC.

Subsection 614.13 shall include the following:

UPS installation will not be measured but shall be included in the Contractor's unit cost for installation of the Traffic Signal Controller and Cabinet. Work shall include all wiring for required connections and related labor and materials required for the completion of the installation.

Subsection 614.14 shall include the following:

UPS installation will not be paid separately, but shall be included in the Contractor's unit cost for installation of the Traffic Signal Controller and Cabinet.

**End Revision of Section 614
Uninterrupted Power Supply (UPS) System (Install Only)**

**REVISION OF SECTION 614
FIRE PREEMPTION UNIT AND TIMER**

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

Section 614.01 shall include the following:

This work consists of furnishing and installing a new fire preemption system at the locations depicted in the plans. These locations include all six of the project intersections. Work includes furnish and installation of all in-cabinet equipment including preemption modules, mounting racks and power supplies; new optical detectors oriented toward the appropriate approach directions; lead-in cable; and all ancillary work required to connect the elements and establish a functioning preemption system.

Subsection 614.08 shall include the following:

The emergency vehicle preemption system furnished and installed for this project shall match the type and manufacture currently deployed in similar applications throughout the City & County of Denver. All equipment furnished for this project shall be new, and shall be the manufacturer's latest available make and model of the required system element.

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.
 - 1. Detector (Type A), 1 Direction, 1 Channel
 - 2. Detector (Type B), 2 Direction, 1 Channel
 - 3. 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.

**REVISION OF SECTION 614
FIRE PREEMPTION UNIT AND TIMER**

- 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.
- 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 -34°C to +60°C (-30°F to +140°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 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 -34°C to +60°C (-30°F to +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.

**REVISION OF SECTION 614
FIRE PREEMPTION UNIT AND TIMER**

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 -34°C to +60°C (-30°F to +140°F).
6. Shall operate in 0 to 95 % humidity.

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 (167O 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 (176O F.), minimum average wall thickness - 1.14mm (.045").
11. Finished O.D.: 7.62mm (0.3") max.

E. System Interface: System shall be capable of operating in a computerized traffic management system when appropriate interfacing is provided by the computer supplier.

F. 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. The manufacturer shall certify upon request that all materials furnished conform to this project special provision. The manufacturer or its designated representative shall be responsible for determining and setting all required range and emitter intensity settings for emergency vehicle operations.

Subsection 614.09 shall include the following:

All equipment except the vehicle emitter assembly shall be installed and wired in a neat and orderly manner in conformance with the manufacturer's 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.

No splices are allowed in the lead-in cable between the optical detector and the cabinet.

**REVISION OF SECTION 614
FIRE PREEMPTION UNIT AND TIMER**

Four channel installations are required at all project locations. Generally, all approaches shall be detected unless otherwise indicated in the plans.

Detector locations shown on the plans are for illustrative purposes only. Exact locations shall be as determined by the Contractor or the designated manufacturer's representative for the best possible line of sight.

If not present in an existing traffic signal controller cabinet, the following items shall be installed and connected, in accordance with the manufacturer's requirements:

- A. Controller harness and adapter
- B. Preemption termination panel with terminal block and relay bases.
- C. Preemption disconnect switch, mounted on the emergency switch panel on inside of cabinet door.
- D. Preemption test buttons, mounted on the preemption 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 preempt inputs to the phase selector. When switched off by the preemption disconnect switch, the traffic signal controller shall not be affected by preempt calls from the optical preemption system. A minimum of two test buttons shall be provided. If there are more than two preempt 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.

- a. The preemption system shall be tested according to the following guidelines:
 - b. Notify the Engineer and Denver Traffic Engineering Services (TES) of the scheduled test.
 - c. Request a Denver Fire Department (DFD) representative and emergency vehicle having an emitter to conduct the test. If not available, the Contractor shall provide an emitter.
 - A. In the presence of the Engineer and the representatives of TES and DFD, test each preempted approach with the emergency vehicle. Test the following elements of the system:
 - 1. Confirm that the emitter activates the phase selector and the phase selector activates the correct preemption input to the controller.
 - 1. Confirm adequate range. The traffic signal must be preempted to green sufficiently in advance of the arrival of the emergency vehicle. The vehicle emitter shall initiate preemption at a minimum distance of 1800 feet.
 - 2. 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.
- d. Document the test. Provide the Engineer with three copies of the test results.

If a malfunction is found or the system requires adjustment (such as range, emitter intensity or detector location), schedule a follow-up test. Repeat the above steps for all approaches until all approaches pass the test.

All adjustments such as emitter intensity, phase selection range, sensitivity, detector placement, shall be made at the intersection by the Contractor so that the optical preemption operates correctly with other preemption equipment currently owned by the City & County of Denver.

**REVISION OF SECTION 614
FIRE PREEMPTION UNIT AND TIMER**

Subsection 614.13 shall include the following:

Fire Preemption Unit and Timer shall include a four-channel card and the number of detectors shown in the plans.

Fire Preemption Unit and Timer shall be measured by the total number of intersections at which the work is required and shall include all labor and materials required to furnish and install all in-cabinet preemption equipment; furnish and install all new optical detectors as shown in the plans; furnish and install new lead-in cable; and provide all wiring connections at the detectors and in the cabinet to successfully establish successful emergency vehicle preemption operations. All labor, materials and ancillary mounting hardware is considered included. Contractor shall be required to demonstrate successful emergency vehicle preemption operation to the satisfaction of the Engineer prior to acceptance of this item for payment. Test and demonstration of successful operation are considered included in the unit cost for this item and will not be measured and paid separately.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Fire Preemption Unit and Timer	Each

**End Revision of Section 614
Fire Preemption Unit and Timer**

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (CAMERA)**

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 furnish and installation of video detection cameras and all required in-cabinet detection equipment at the signalized intersection locations depicted in the plans. Contractor shall provide all required lead-in cables between detectors and cabinet; and all required wiring connections at the detectors and at the cabinet to establish successful video detection. New lead-in cable shall be as per manufacturer's recommendation. Splices in the lead-in cable are not permitted.

Contractor shall be required to demonstrate successful detection operations to the satisfaction of the Engineer prior to acceptance of this item for payment.

Subsection 614.08 shall include the following:

(n) Video Detection System

The intent of the following specification is to describe the minimum requirements for providing a complete Video Detection System. Initially, the system shall be capable of providing presence vehicle detection at selected intersections. The video system shall be expandable without removing or replacing existing units.

The purpose of the Video Image Processor (VIP) is to detect the presence of vehicles over optical detection zones, which are placed on a standard video image (CCIR or EIA). Using standard image sensor optics and in the absence of occlusion, the system shall be able to detect vehicle presence with 98% accuracy under normal conditions (days and nights), and 96% accuracy under adverse conditions (fog, rain, snow).

All items and materials furnished shall be new, unused, current production models installed and operational in a user environment and shall be items currently in distribution. The detection algorithms shall have a proven record of field use at other installations for at least (3) years of service i.e., not including prototype field trials prior to installation. Video cameras shall be available commercially; no sole source cameras will be allowed.

These technical specifications describe the minimum physical and functional properties of a video detection system. The system shall be capable of monitoring all licensed vehicles on the roadway, providing detection for areas outlined in the construction drawings.

1. MATERIALS

1.1 The entire video detection system shall consist of the following:

- a. Video Detection Module VIP3D.1 or 3D.2
- b. Viewcom/E- Remote Monitoring and Image Storage Module
- c. Video Camera(s) with IR Filter, Lens, Enclosure, and Sun Shield
- d. Luminaire Arm or Signal Mast Arm Sensor Bracket(s)
- e. Surge Suppressor
- f. Programming Device and/or Software
- g. Coaxial/Power Cable
- h. All Other Necessary Equipment for Operation
- i. Training for Installation, Operation, and Maintenance

**REVISION OF SECTION 614
INTERSECTION DETECTION SYSTEM (CAMERA)**

- 1.2 The following equipment package has been pre-approved for use on this project.
- a. Traficon VIP3D.1 or 3D.2 Video Image Processor.
 - b. Traficon Viewcom/E Remote Monitoring and Image Storage Module.
 - c. Agis Outdoor Camera Housing-HS9383/60.
 - d. Agis Camera Housing Sunshield-HS9388/00.
 - e. Rainbow Motorized Zoom Lens 6.5mm to 65mm Model-BL58FZD65K.
 - f. Rainbow B/W 9" Video Monitor Model-RMB92.
 - g. KAR-GOR Universal Camera Mount Part Number-MA/SOP-16.
 - h. Pelco Extended Mast Arm Camera Mount-AB-0172-L-L.
 - i. Edco Suppressor-CX06-MI-BNC or Hesco/RLS-HE75CX.
 - j. Coaxial +5 Conductor Wire-RG59U+STR PE/PVC 600V KG-9915P.

2. VIDEO DETECTION SYSTEM

- 2.0 The Video Image Processor (VIP) shall be modular by design and housed in either a self-contained stand-alone unit or fit directly into NEMA TS-1&TS-2 type racks as well as type 170/2070 input files.
- 2.1 The system shall control from 1 to 6 VIP boards allowing from 1 to 12 image sensors.
- 2.2 The VIP3D (VIP3D.1 and VIP3D.2) provides information on the presence of vehicles approaching or waiting at the intersection in combination with traffic data collection, flow monitoring and loop emulation in one single detector board.
- 2.3 VIP3D.1 monitors one camera and the VIP3D.2 monitors two cameras.
- 2.4 Functional Characteristics (PRESENCE)
- 2.4.1 The user can define up to 24 presence detection zones for VIP3D.1 and up to 20 presence detection zones for VIP3D.2 (per camera).
 - 2.4.2 Within those 24 or 20 zones, there can be a maximum of 6 queue length zones.
 - 2.4.3 A zone shall be able to be direction sensitive.
 - 2.4.4 Each VIP3D board shall be able to handle up to 24 outputs and 20 inputs.
 - 2.4.5 There shall be 4 outputs on the VIP3D board itself. Via I/O modules, the number of inputs and/or outputs can be expanded.
 - 2.4.6 The 20 inputs, together with the presence detection zones, can be combined to form an output. The logical functions that can be applied with the presence zones are an AND, OR and NOT function (Boolean Logic).
- 2.5 Functional Characteristics (Traffic Data)
- 2.5.1 Measurement of traffic flow speed between 0 and 150 km/h (up to 8 lanes for VIP3D.1 and 4 lanes for VIP3D.2).
 - 2.5.2 Automatic detection of 5 types of traffic flow (normal, delay, congested, and stop& go).
 - 2.5.3 Monitor the zone occupancy of detection area.
 - 2.5.4 Detection of speed drop, detection of wrong-way drivers.
 - 2.5.5 Vehicle classification for up to 5 classes (vehicle length classification).
 - 2.5.6 Data:

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<u>Traffic data:</u>	<u>Units</u>
<i>Volume per length class and per lane</i>	<i>absolute number</i>
<i>Average speed per length class and per lane</i>	<i>km/h</i>
<i>Average gap time per length class and per lane</i>	<i>0, 1 sec</i>
<i>Average headway per lane</i>	<i>meters</i>
<i>Occupancy per lane</i>	<i>%</i>
<i>Concentration per lane</i>	<i>absolute number/km</i>
<i>Confidence level</i>	<i>worst 0, best 10</i>

- 2.5.7 Alarms are generated for large range of events: queue, inverse direction, speed drop, no video, and error.
- 2.5.8 VIP3D provides data to controller via optically isolated open-collector outputs.
- 2.6 Each VIP board shall allow for 20 digital inputs via the I/O expansion port.
- 2.7 Each VIP board shall have error detection. Outputs will be turned “ON” if the video signal is bad or the VIP board is not functioning properly. A user defined quality level will automatically put selected outputs to recall in cases of severe degraded visibility (i.e., fog, blizzard, etc.). Normal detection resumes when visibility improves above the user defined quality level.
- 2.8 Operator selectable recall shall be available via the VIP front panel. Holding the recall switch on for 5 seconds shall activate this function.
- 2.9 A video select button on the VIP front panel will switch between camera images of the VIP3D.2.
- 2.10 The VIP board shall have a reset button on the front panel to reset video detectors to “learn” the roadway image. During “relearn”, selectable recall can be enabled or disabled for immediate operation. Learning time of video detectors shall be less than 6 minutes.
- 2.11 External surge suppression, independent of the VIP board shall separate the VIP from the image sensor.

3. EVENT LOG DATABASE

- 3.1 The VIP module shall have an onboard database capable of time stamping and storing events. The Event Log Database can be viewed or downloaded to a selected spreadsheet. Erasure of the Event Log Database shall not alter programming configurations. The VIP shall log and time stamp, 500 deep the following events; 1] Firmware upgrade; 2] Loss of video signal; 3] Resumption of video signal; 4] Configuration change; 5] Bad video quality; 6] Loss of power to VIP module; 7] Speed alarm; 8] Inverse direction; and 9] Recall activated.

4. VIP BOARD

- 4.1 The VIP board shall have separate light emitting diodes (LEDS) that indicate:
 - 4.1.1 POWER - Red LED to verify power supply.
 - 4.1.2 I/O COMM - Red LED to indicate communications power to expansion boards.
 - 4.1.3 VIDEO 1&2 - Red LED to verify the presence of video @ 75 ohm
 - 4.1.4 TX & RX - Red LED to indicate communications to Viewcom-E module via RS485.
 - 4.1.5 OUT1-OUT4 - Green LED if the corresponding detection group is active.

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- 4.2 The VIP board shall also have 2 separate buttons for: VIDEO SELECT-RECALL
 - 4.2.1 RECALL - Manually places call on detectors
 - 4.2.2 RESET - Manually reset detectors to “learn” new background
 - 4.2.3 VIDEO OUT - The VIP board shall also have a video out female RCA style connector
 - 4.2.4 PORTS - DB9 female Service Port and DB9 I/O Expansion port.
- 4.3 Test Outputs - It shall be possible to TEST the outputs of the VIP module.
- 4.4 Force Alarms - It shall be possible to activate an alarm manually. This feature is meant for testing the communication with reporting software. The following alarms shall be forced:
 - 4.4.1 Force no video
 - 4.4.2 Force Bad video
 - 4.4.3 Force Inverse direction
 - 4.4.4 Force Speed drop
 - 4.4.5 Data Storage Capacity:
- 4.5 Data storage capacity of the VIP3D is related to integration interval and also depends on the configuration of the board (vehicles classification). Depending on the number of classes defined, the number of records that can be recorded shall be up to 8313.

5. VIDEO SYSTEM COMMUNICATION MODULE

- 5.1 The Communication board shall be modular by design and housed in either a self-contained stand-alone unit or fit directly into NEMA TS1 & TS2 type racks as well as type 170/2070 input files.
- 5.2 The Communication board shall control from 1 to 6 VIP boards allowing for 1 to 2 image sensors.
- 5.3 The system shall be designed to operate reliably in the adverse environment of roadside cabinets and shall meet or exceed all NEMA TS1 and TS2, as well as type 170/2070 environmental specifications.
- 5.4 Ambient operating temperature shall be from -34 to + 74 degrees C at 0 to 95% relative humidity non-condensing.
- 5.5 The system shall be powered by 12-40 VDC and draw less than 500 milliamps.
- 5.6 Serial and Ethernet (TCP/IP) communications shall be through respectively an RS 232 serial port (F DB9 connector) and Ethernet port (RJ-45 connection). These ports can be used for communications to a laptop or modem to upload/download detector configurations, traffic data, and technical events, send firmware upgrades and do remote setup of detectors. RS485 on the rear edge connector shall facilitate communications to VIP boards.
- 5.7 Surge ratings shall be set forth in the NEMA TS1 and TS2 specifications.
- 5.8 The LAN port shall meet IEEE 802.3 with a RJ-45 connector and meet the following specification: Data rates for Ethernet via port: 10 Mbits/s; TCP/IP based protocol.
- 5.9 The serial port communications port shall meet EIA-232-E and meet the following specifications:

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- 5.9.1 Dial-up data rates for RS232 via Serial port: Maximum 57600bps
- 5.9.2 Direct data rates for RS232 via Serial port: Maximum 11520bps.
- 5.9.3 Mode of operation: Asynchronous, serial 8 bit word, 1 stop bit, duplex or half- duplex.
- 5.9.4 Parity: None
- 5.9.5 Handshake: RTS-CTS, DCD
- 5.9.6 Configuration: DTE

- 5.10 The Communication board shall have separate light emitting diodes (LEDS) that indicate:
 - 5.10.1 POWER - Red LED to verify power supply.
 - 5.10.2 LAN - Red LED to indicate data activity over Ethernet communication
 - 5.10.3 PORTS - Board status via RCA style connector.
 - 5.10.4 PUSH BUTTON RESET - Manual reset to re-initialize communications.
 - 5.10.5 SERVICE PORT - DB9 female Service port for setup of communication board and also used for serial/dialup communication.

- 5.11 The communication shall support all functions of video detection system.

- 5.12 All data transmissions shall be protected by CRC (cyclic redundancy checking) or an equivalent error detection method.

- 5.13 The communication board shall be programmed WITHOUT the use of a supervisor computer. A standard CCTV monitor and keypad plugged into the communication serial port will facilitate board programming.

- 5.14 The communication shall support streaming video over Ethernet and serial communication.

- 5.15 Password protected remote setup (configuration upload/download, setup of detectors and detector parameters, setup of communication board parameters, firmware updates for communication and VIP module) and monitoring of every connected VIP module shall be possible.

- 5.16 Dialup shall be possible through PSTN modems.

- 5.17 The Communication board shall log data and events provided by the VIP module (s) and transmit data and events to the HOST computer.

- 5.18 RS485 communication to every VIP module shall be established via the Edge connector.

- 5.19 The communication board shall be able to store on board pre-stored video sequences of alarm triggered upon traffic user defined events. When connected to a HOST computer, the JPEG video sequences shall automatically be downloaded to the HOST computer.

- 5.20 The communication board shall be able to accept PAL or NTSC video format.

- 5.21 A (via Ethernet) connection with a standard Internet browser shall be possible to communicate with the Communication board for remote setup, monitoring and real-time data of the VIP modules.

- 5.22 Password protection shall be provided on the communication board for remote operations.

6. FUNCTIONAL CAPABILITIES

- 6.1 Real time detection

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- 6.2 Each VIP board shall be capable of processing the video signal of one or two cameras. The video signal shall be analyzed in real time (30 times per second for NTSC video format and 25 frames per second for PAL video format).
- 6.3 The system shall be expandable up to 12 cameras that may be connected to different VIP units and programmed independently.
- 6.4 The system shall be capable of displaying detectors on the connected video image with associated outputs. Outputs/Inputs status will be indicated on the screen. Parameters will also include the ability to view raw video without any verbiage and/or detectors for surveillance purposes.
- 6.5 Each VIP board will detect within the view of connected camera the presence of vehicles in user defined zones. Detectors available shall be presence, count, delay, extension, or pulse mode for either arrival or departure of vehicles. Delay and extension shall be defined between 0.1-99.9 seconds and pulse mode between 0-200ms in 33ms increments if NTSC is used. Each VIP board shall also detect and collect within the view of the connected camera traffic data of passing vehicles in user-defined zones. Collected traffic data by direction shall include:
 - 6.5.1 Volume (absolute numbers) per length class and per lane.
 - 6.5.2 Average speed (km/h or mph) per length class and per lane.
 - 6.5.3 Average gap time (1/10 sec) per length class per lane.
 - 6.5.4 Average headway (m or feet) per lane.
 - 6.5.5 Average length (m or ft) per lane.
 - 6.5.6 Occupancy (%) per lane.
 - 6.5.7 Concentration (vehicles/km or mile) per lane.
 - 6.5.8 Confidence level (0-10) per lane.
- 6.6 The VIP board shall be programmed WITHOUT the use of a supervisor computer. A standard CCTV monitor and keypad plugged into the VIP serial port will facilitate detector programming.
- 6.7 The VIP board shall store up to 4 detector configurations. It shall be possible to switch between detector configurations manually, automatically by time of day or remote input.
- 6.8 Via the serial port, detector configurations can be uploaded to a laptop and stored on disk.
- 6.9 Detectors may be linked to 24 outputs and 20 inputs using Boolean logic features: AND, OR, NOT. It will be possible to generate conditional outputs based upon inputs from a controller.
- 6.10 It shall be possible to make a detector directional sensitive. Options will include an omni-directional detector or a detector that only senses movement: from right to left, left to right, up to down or down to up as the operator looks at the monitor.
- 6.11 All detectors and parameters can be changed without interrupting detection.
- 6.12 Four data detection zones per camera on a two camera VIP board may be used for collection of vehicle count, speed, classification, occupancy density, headway, and gap time. Eight data detection zones may be used on a signal camera VIP board. These detectors will detect and store traffic data at user-defined intervals of 1, 2, 3, 5, 6, 10, 15, 30 & 60 minutes. It shall be possible for each VIP board to store up to 6713 intervals of data in non-volatile memory.

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- 6.13 Associated software may be used with a PC to download data and export to a spreadsheet. Software will also be used to upload and download detector configurations, traffic data, technical events, send software versions upgrades and do remote setup of detectors.
- 6.13.1 DOWNLOAD THE DATABASE TO A PC - Downloading a VIP database to a PC shall be done via the VIPLINK software.
- a. Date Stamp - Date: Day/ Month/ Year
 - b. Time Stamp - Time: Hour/ Minute/ Second
 - c. Interval - Interval Time (sec)
 - d. Nr class - Number of class of the vehicle (max 5)
 - e. Lane nr - Lane number (speed zone) (1 to 8)
 - f. Headway - Average headway on lane x (m)
 - g. Conx - Concentration of lane x
 - h. Num l_x - Number of vehicles during the selected time interval of class x
 - i. Gap l_x - Average Gap time of class x lane y (0.1 sec)
 - j. Spd l_x - Average Speed of class x lane y (km/h or mph)
 - k. Len x - Average length of the vehicles on lane x (m)
 - l. Occx - Occupancy of lane (%)
 - m. ConfiX - Quality of the image (0= very bad, 10= very good)
- 6.14 The VIP board shall have an internal clock with daylight savings time system, which can be enabled or disabled.
- 6.15 The VIP board shall provide overlaid tool tips for each individual menu and submenu-items.
- 6.16 The VIP board shall have optional password implementation. Different user- levels shall be available each having different rights. A minimum of 10 users can be defined for each user-level.
- 6.17 The VIP board shall be able to delay or extend a detector zone output in combination with an input from the controller.
- 6.18 The VIP board shall detect wrong-way drivers and shall provide an alarm/event via communication board and/or output.
- 6.19 The VIP board shall provide an alarm and/or output when the user selected queue detection threshold of occupancy is exceeded for more than a user selected time threshold.
- 6.20 The VIP board shall distinguish five classes of detected vehicle based upon user selectable vehicle length threshold.
- 6.21 The VIP shall be able to emulate loop emulation with user- selectable loop dimensions.
- 6.22 Double Loop Simulation - Each Video Detection zone shall cover the same area as 2 successive loops. Based on speed of passing vehicles and fixed parameter vehicle length, the algorithm shall calculate pulse length that corresponds to traffic data values. As the 2 identical pulses (shifted in Time) are generated, the outputs that correspond to the detection zones are activated.
- 6.23 Single Loop Simulation - To emulate the functioning of one loop, the video detection zone shall cover the same area as the loop. Based on speed of the vehicle and the vehicle length (fixed parameter), the algorithm shall calculate the pulse length that corresponds t the traffic data values. When the pulse is generated, the output that corresponds to the detection zone is activated.

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- 6.24 Presence Detection Hold Time - The presence detection hold time shall have an advanced detection parameter used to adjust the maximum time a presence zone can hold a standing vehicle. By default it is set to 4 minutes since intersection cycle lengths rarely exceed this time. In case a longer cycle lengths are needed this value shall be able to be increased. When a zone is detecting presence without movement for more than the detection hold time, the zone will relearn. {default: 240 sec} {range: 10 to 60 sec}

7. IMAGE SENSOR - CAMERA

- 7.1 The unit shall be a high resolution, 1/3" image format CCD camera, designed for professional video surveillance systems. Incorporating the latest in CCD technology, the video camera shall provide detailed video without lag, image retention, or geometric distortion. Features include: 1] 1/3" Black & White (Sony chipset); 2] 580 TV lines resolution; 3] high sensitivity of 0.06 lux; 4] 12VDC or 24VAC input; 5] Electric iris; 6] Multi-zone backlight compensation; 7] Built-in isolated power supply; 8] 3-year warranty; and 9] Back focus mode.

7.2 Camera Specifications:

- 7.2.1 Sensor - Interline 1/3" Sony Super HAD CCD
- 7.2.2 TV System - EIA Standard
- 7.2.3 Effective Pixels - 768 (H) x 494 (V)
- 7.2.4 Horizontal Resolution - 580 TV Lines
- 7.2.5 Signal to Noise Ratio - More than 48db
- 7.2.6 Minimum Illumination - 0.06 lux at. F1.2
- 7.2.7 Video output - 1vp-p, 75 ohm
- 7.2.8 Sync System - Phase adjustment Line Lock-Range 0-270d/Internal selectable
- 7.2.9 Auto-Iris Drive - DC or Video Type (4-pin square connector)
- 7.2.10 Electronic Iris - 1/60- 1/100,000 sec. - On/Off selectable
- 7.2.11 BLC (Backlight Compensation) - Backlight compensations-On/Off Selectable
- 7.2.12 AGC (Automatic Gain Control) - On/Off Selectable
- 7.2.13 Power Requirement - 12VDC or 24VAC +/- 10% 60 Hz, 250mA Max Isolated Power Supply Built Into Camera
- 7.2.14 Operating conditions - 14d F to 122d F (-10d C to 50d C) within 85% RH
- 7.2.15 Lens Mount - CS/C (C-mount adapter included), with Cam-type Back focus adjustment.
- 7.2.16 Camera Mount - 1/4"- 20 (Top or Bottom Selectable)
- 7.2.17 Dimensions - 1.9x1.9x3.3 inches (47mmx47mmx83mm)
- 7.2.18 Weight, Color - 7.1 oz (200g) off white

7.3 Image Sensor – Zoom Lens Specifications:

- 7.3.1 Lens zoom - 1/3" 6.5-65mm Motorized DC type Auto-Iris CS-mount
- 7.3.2 Focal length - 6.5-65mm
- 7.3.3 Maximum relative aperture - 1:1.4
- 7.3.4 Iris - F1.4-Approx. 360 (With ND Spot Filter)
- 7.3.5 Zoom ratio - 10X
- 7.3.6 Mount - CS-mount
- 7.3.7 Minimum object distance - 1.2m (from front vertex)
- 7.3.8 Angular field of view - 1/3": 40.5dx 31.0d at 4.2dx3.2d at 65mm
- 7.3.9 Optical back focal distance - 9.85mm (in air)
- 7.3.10 Operation (Zoom) - Motorized (DC+-4V-12V, Max 40mA) Speed Approx.6.5Sec. (At 6.4V)
- 7.3.11 Operation (Focus) - Motorized (DC+-4V-12V, Max 40mA) Speed Approx. 6.5 Sec. (at 6.4V)
- 7.3.12 Operation (Iris) - IG (Auto Close System) Close to open: <4.0V Open to Close: < 0.1V Speed within 4sec.

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7.3.13 Operating temperature: -10 - + 50d C (+14 – 122d F)

7.3.14 Filter Size - 43mm PO.75

7.3.15 Weight - Approx. 285g

7.4 Image Sensor Housing - The environmental housing shall be an aluminum enclosure designed for outdoor CCD camera installations.

7.4.1 Temperature Range: -40 to +50 degrees C

7.4.2 Dimensions - 449mm x 97mm x112mm

7.4.3 Weight - 1.4kg

7.4.4 Housing Mounting - Three ¼-20 tapped holes

7.4.5 Camera mounting - Removable cradle assembly

7.4.6 Cable Entry - Three liquid tight fittings that accept cable diameter of: 1] One fitting: 2-7 mm; 2] Two fitting: 3-10mm

7.4.7 Finish - Off- White Semi-gloss polyurethane

7.4.8 Construction - Extruded aluminum housing, aluminum rear- end cap, aluminum front cap with glass face plate, and aluminum cradle. A sunshield shall be included.

7.4.9 Window - 3mm thick glass that includes a thermostatically – controlled window with heater/fogger strip

7.4.10 Rated input voltage: 115 VAC 60 Hertz

7.4.11 Voltage range: 108 VAC to 132 VAC

7.4.12 Output Voltage: 24 VAC 60 Hertz

7.4.13 Nominal power: 30 Watts

7.4.14 Enclosure protection: Waterproof and dust tight in a NEMA-4, IP65, enclosure Type 3

8. SURGE PROTECTION

8.1 A video surge suppressor (s) shall be available for installation inside the traffic signal controller cabinet. The suppressor shall provide coaxial cable connection points to an EDCO CX06-BNCY or HESCO/RLS-HE75CX transient suppressor for each image sensor.

8.1.1 Operating Voltage: 5

8.1.2 Clamping Voltage: 6-selectable

8.1.3 Frequency Range: 0 to 200 MHz

8.1.4 Equipment Location: IEEE Category C, and Category B

8.1.5 Rated Load Current: 0.35 amperes

8.1.6 SPD Topology: 2- port Series

8.1.7 SPD Technology: Primary Stage Gas Discharge Tube (GDT) and Secondary Stage Silicon Avalanche Diode (SAD), with Series PTC

8.1.8 Modes of protection - Signal to ground

8.1.9 Nominal Discharge Current per Mode: 10.0kA

8.1.10 Maximum Discharge Current per Mode: 20.0kA

8.1.11 EMI Attenuation: <0.1 dB at 20 MHz

8.1.12 VSWR: <1.2

8.1.13 Continuous Power: 0.72 Watts

8.1.14 Operating Humidity: 0-95% Non-Condensing

8.1.15 Operating Temperature: -40 C to +85 C

8.1.16 Storage temperature: -40 C to + 85 C

8.1.17 Input Connection Type: BNC, 75 Ohm

8.1.18 Output Connection Type: BNC, 75 Ohm

8.1.19 Mounting: Flange

8.1.20 Enclosure Type: Metal

8.1.21 Certifications: UL 497B pending, NFPA 780 (2004) Compliant for communication protectors.

8.1.22 Warranty: 5 Years

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9. IMAGE SENSOR-MOUNTING BRACKETS

- 9.1 Mast-Arm installations shall be mounted using a PELCO ASTRO BRACKET part number AB-0169-L-L, Camera Mount part number SH-0515, Support Tube AB- 2003-L 74", Astro- Bracket Clamp part number AB- 3009-L. Connection shall be made in a 4 x 6 x 2" utility box, part number KG-462.
- 9.2 Luminaire Arm installations shall be mounted using a KAR-GOR UNIVERSAL MOUNT part number MA/SOP-16. Connection shall be made in a 4 x 6 x 2" utility box part number KG-462.

10. IMAGE SENSOR-CABLE (COAXIAL & POWER)

- 10.1 Coaxial & Power cable (Siamese) shall be installed in conduits or overhead as indicated in the plans. Coaxial cable shall be suitable for exterior use and in direct sunlight. Power cable will have a minimum of 5 conductors.
- 10.2 Coaxial cable will be terminated in the surge suppressor before being connected directly to VIP boards.
- 10.3 Power cable will be terminated into a fuse panel provided by the manufacturer and connected to 120 VAC in the controller cabinet.
- 10.4 Description of cable: Composite, 6 Conductors2 elements: 18awg 5 conductors 7/26 bare copper, .016" polyethylene, 20awg 1conductor, solid bare copper, .056" foam polyethylene jacket black, overall .030" PVC jacket black.

10.5 Specification of 5-Conductor Cable:

	<u>ELEMENT 1</u>	<u>ELEMENT 2</u>
10.5.1 Conductors/pair count:	5 conductors	1 conductor
10.5.2 Gauge & stranding:	18AWG 7/26 BC	20AWG solid BC
10.5.3 Primary insulation type:	Polyethylene	Foam PE
10.5.4 Insulation thickness:	.016"	.056"
10.5.5 Color code:	White, Red, Blue, Black, Brown	Natural
10.5.6 Shield:	N/A	N/A
10.5.7 Tape:	N/A	N/A
10.5.8 Drain wire:	N/A	N/A
10.5.9 Braid:	N/A	95% BC
10.5.10 Capacitance:	N/A	N/A
10.5.11 Print legend:	N/A	N/A
10.5.12 Jacket type:	N/A	Polyethylene
10.5.13 Jacket color:	N/A	Black
10.5.14 Jacket thickness:	N/A	.035"
10.5.15 Nominal OD:	N/A	.242"

10.6 Overall Assembly of Wire

- 10.6.1 Jacket Thickness - .030"
- 10.6.2 Jacket Color - Black
- 10.6.3 Jacket Material - PVC
- 10.6.4 Ripcord - Yes
- 10.6.5 Nominal OD: .512"

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- 10.6.6 Voltage Rating: 600V
- 10.6.7 Temp. Rating: 75C
- 10.6.8 UL Type or Style - CM c (UL) E179333
- 10.6.9 Print Legend - KAR-GOR P&T RG59U + 18/5 e(UL)Type CM
- 10.6.10 Shipping Weight - 100lbs/MFT

11. I/O EXPANSION BOARD

- 11.1 The I/O expansion board shall be a separate board that may be used in combination with the VIP3D board to extend the number of inputs or outputs. There are 2 types of I/O boards; the 2 I/O that provides 2 additional inputs or outputs and the 4I/O board (with 4 additional inputs or outputs)
- 11.2 Each VIP3D board shall have a maximum 20 additional inputs and 20 additional outputs (additional to the 4 outputs on the detector board). This is achieved by combining I/O boards. The I/O boards are connected to the detector board via a multi-connection flat cable.
- 11.3 Password protection of I/O module: It shall be possible to insert a password for authentication. There shall be 4 types of users that can log on: 1] Administrator (highest level); 2] Supervisor (second highest level); 3] User (limited permission); and 4] Guest (lowest, can only change the display menu).
- 11.4 Specifications of the VIP board:
 - 11.4.1 Dimensions - TS 2 rack compatible board; 2.34"Wx4.5"Hx7.00"D excluding the handle
 - 11.4.2 Communication - RS-232C service ports for set-up; RS-485 (polling by communication board)
 - 11.4.3 Inputs - Composite video 75 ohms-1Vtt CCIR/EIA; Power supply; Reset button on front panel
 - 11.4.4 Outputs - Analog video output with possible overlay of system info; Auto diagnostic LED indicators; 4 optically isolated open-collector outputs
 - 11.4.5 Connector (back) - Double row 22 pins EDGE (NEMA TS2-1992)
 - 11.4.6 Power Supply & Construction: +10.8V dc to +26.5V dc (150mA)
 - 11.4.7 Environmental: -34 degrees C to +74 degrees C; 0 to 95% relative humidity-non condensing
 - 11.4.8 EMC - EN 55022-EN50082-2 Industrial

12. INSTALLATION & TRAINING

- 12.1 The product supplier of the video detection system shall supervise the installation and the testing of the video equipment. A factory certified representative from the manufacturer shall be on-site during installation. The factory representative shall install, make fully operational, and test the system as indicated on the intersection drawings and this specification.
- 12.2 Two days training shall be provided to personnel of the contracting agency in the operation, setup, and maintenance of the video detection system. Instruction and materials shall be produced for a maximum of 10 persons and shall be conducted at a location selected by the contracting agency. The contracting agency shall be responsible for travel, room and board expense for its own personnel.

13. WARRANTY

The video detection system shall be warranted against manufacturing defects in materials and workmanship for a period of three years from date of shipment. The video detection supplier shall provide all documentation necessary to maintain and operate the system.

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Subsection 614.13 shall include the following:

Intersection Detection System (Camera) shall be measured by the total number of cameras utilizing such a system as summarized across the project. The item shall include all labor and materials necessary to provide a fully-functional installation which operates to the satisfaction of the Engineer. If the assistance of the manufacturer is required to facilitate successful installation, the cost of all such assistance shall be included in the unit price for this item and will not be measured and paid separately.

As a condition of acceptance, Contractor shall be required to demonstrate successful detection operation to the satisfaction of the Engineer.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Intersection Detection System (Camera)	Each

**End Revision of Section 614
Intersection Detection System (Camera)**

**REVISION OF SECTION 614
CLOSED CIRCUIT TELEVISION CAMERA (SURVEILLANCE)**

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 the furnishing and installation of a closed circuit television camera and cabinet at the locations shown on the plans. Intended use of the item is for traffic surveillance.

Subsection 614.08 shall include the following:

Closed circuit camera materials and equipment shall be as follows:

Closed circuit television camera shall be the Panasonic WV-SC386 CCTV IP Camera or an equivalent IP (Ethernet) camera as approved by the City and County of Denver Traffic Engineering Services. The following accessories shall be provided for each IP camera: Panasonic PAPM3 Pole Mount Bracket; Panasonic POD9CW Dome Housing (wall mount); Altronix T2428100 24 VAC transformer All cameras and accessories material specifications shall be submitted to the City and County of Denver - Public Works Traffic Engineering Services for review and approval.

Subsection 614.10 shall include the following:

The CCTV camera shall be installed in accordance with the details shown in the plans and in accordance with the manufacturer's recommendations. The Contractor shall deliver the camera and accessories to the City & County of Denver Traffic Operations Division at 5440 Roslyn Street, Denver, CO at least four (4) weeks prior to installation for camera calibration and set-up by City forces. Contractor shall pick up the camera and install it at the proper location. The Contractor shall make arrangements for a City & County of Denver Traffic Operations Division representative to be on-site to ensure proper installation.

Subsection 614.13 shall include the following:

Closed circuit television camera shall be measured by the actual number of cameras that are installed and accepted. All labor and ancillary materials such as housings, brackets, transformers, modems and other accessories are considered included in the unit price. All transportation costs for camera delivery and pick-up at the Denver Traffic Operations Division are considered included in the unit cost of this item.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Closed Circuit Television	Each

Payment will be full compensation for all labor, materials, accessories, and equipment required to complete the work.

**End Revision of Section 614
Closed Circuit Television Camera (Surveillance)**

**REVISION OF SECTION 614
TRAFFIC SIGNAL FACES (GENERAL)**

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

In Subsection 614.08 (h), delete the fourth paragraph and replace with the following:

The optical units of all vehicle signal faces and all pedestrian signal faces shall be an LED Traffic Signal Section Optical Unit conforming to the requirements of subsection 713.11. The LED optical units shall be installed in accordance with the manufacturer’s instructions.

Pedestrian Heads shall be countdown type in accordance with City & County of Denver standards. See the stand-alone Project Special Provision for Countdown Pedestrian Signal Faces.

Black back-plates shall be provided on all signal heads except for those installed on two-way spacers.

Subsection 614.13 shall include the following:

LED traffic signal faces of the vehicular and pedestrian type shall be measured by the actual number of units that are installed and accepted.

LED and countdown features are considered included in the unit price for traffic signal and pedestrian signal faces.

Furnish and installation of back-plates shall be included in the unit price for traffic signal faces.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Traffic Signal Face (12-12-12)	Each
Traffic Signal Face (12-12-12-12-12)	Each
Pedestrian Signal Face (16) (Countdown)	Each

**End Revision of Section 614
Traffic Signal Faces (General)**

-1-
**REVISION OF SECTION 614
COUNTDOWN PEDESTRIAN SIGNAL FACES**

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

Subsection 614.01 shall include the following:

This work includes furnish and installation of LED Pedestrian Signal Faces with countdown timers as depicted in the plans.

Subsection 614.08(h) shall include the following:

Pedestrian signal faces with countdown 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 current ITE PTCSI Standards.
- Signal housing shall be aluminum, painted 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 count down 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 symbols styles shall not be permitted.
- The Hand/Person 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 power outage.

Subsection 614.13 shall include the following:

LED traffic signal faces of the pedestrian type shall be measured by the actual number of units that are installed and accepted. LED and countdown features are considered included in the unit price for pedestrian signal faces.

**End of Revision of Section 614
Countdown Pedestrian Signal Faces**

**REVISION OF SECTION 614
PEDESTRIAN PUSH BUTTON**

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

Subsection 614.08(f) shall include the following:

Push button assemblies shall be of the direct push button solid state momentary 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 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 4 stainless steel vandal resistant screws. The push button shall operate on logic ground.

The solid state Piezo switch shall be entirely isolated & transient protected from the housing and the metal plunger. The internal circuitry shall be potted in epoxy to provide full environmental protection. The pushbutton shall consist of a 2 inch 303 stainless steel metal plunger and an oil and gasoline resistant Piezo solid state momentary switch, all encased in 6061 T6 Aluminum Bezel enclosure with four (4) mounting holes. The solid state switch shall be normally open and shall be closed with an operating force of less than 3lbf, restoring to the normally open position after a closure dwell time of 150ms. Pedestrian actuation feedback shall be provided with each actuation in the form of a momentary red LED flash and two tone press and release audible tones.

The button shall be replaced, repaired or purchase value refunded if it fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery.

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 ½ 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 ¾" pedestrian instruction sign.

Pedestrian Instruction Sign

Pedestrian instruction signs shall conform to the latest version of the MUTCD, published by the United States Department of Transportation, Federal Highway Administration.

Pedestrian instruction signs shall be Type R10-3a, Type R10-3b, Type R10-3c, Type R10-3d and Type R10-3e as specified in the contract documents.

Pedestrian instruction signs shall be constructed in accordance with the applicable provisions of the current City & County of Denver Standard Specifications. Pedestrian instruction signs 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 6-¾" for the 5" x 7-¾" sign and 7" x 10" for the 9" x 12" sign. The pedestrian instruction signs shall have rounded corners of a ¾" radius for the 5" x 7-¾" signs and 1-½" radius for the 9" x 12" sign.

**REVISION OF SECTION 614
PEDESTRIAN PUSH BUTTON**

Subsection 614.13 shall include the following:

Pedestrian push buttons shall be measured by the actual number of units that are installed and accepted. Pedestrian sign, housing, frame and all labor and additional materials required for the complete installation are considered included in the unit cost.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Pedestrian Push Button	Each

**End of Revision of Section 614
Pedestrian Push Button**

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**REVISION OF SECTION 614
TRAFFIC SIGNAL POLES**

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

Subsection 614.08(g) shall include the following:

All traffic signal poles, mast arms and luminaire arms shall conform to City & County of Denver Standards and XCEL Energy requirements.

The traffic signal pole standards are included in this Project Special Provision.

All traffic signal-light poles and traffic signal-light-span wire poles shall include a 10 foot long luminaire arm and 250 Watt high pressure sodium curvilinear style luminaire in accordance with current City & County of Denver Standards.

Prior to the order of poles, mast arms, luminaire arms and luminaires, Contractor shall submit material specifications to City & County of Denver Traffic Engineering Services (TES) Division for approval.

Painting: All traffic signal-light poles of the mast arm or span wire type shall be powder coated in accordance with the following specifications:

Super Durable Powder Coating – The super durable powder coating shall consist of a urethane or triglycidyl isocyanurate (TGIC) polyester powder, and provide a minimum of three times the gloss retention, color retention and ultraviolet (UV) light resistance as standard powder coatings.

Color shall be dark olive green, in conformance with Federal Specification 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 re-circulating, closed cycle centrifugal wheel system with abrasive conforming to SAE Shot Number S280.

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°F and a maximum of 400°F.

Exterior Coating – All exterior surfaces shall be coated with urethane or TGIC polyester powder to a minimum film thickness of 2.0 mils (0.002 inches). The coating shall be electrostatically applied and cured in a gas fired oven by heating the steel substrate to a minimum of 350°F and a maximum of 400°F. The thermosetting powder resin shall provide both intercoat as well as substrate fusion adhesion the meets 5A or 5B classifications of ASTM D3359.

Packaging – Prior to shipment, small poles shall be wrapped in 0.188" thick UV-inhibiting plastic backed foam. Larger poles shall be cradled in a 1.0" rubberized foam base.

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REVISION OF SECTION 614
TRAFFIC SIGNAL POLES

ANCHOR BOLT DETAIL

NOTES:
ANCHOR BOLTS

- (4) 1/2" DIAMETER ANCHOR BOLTS PER CAISSON WITH (2) 2" HEX AND (2) 2" WASHERS FOR BOLT WITH THREADED END GALVANIZED TO AT LEAST 12" FROM END.
- LENGTH, THREAD LENGTH, HOOK LENGTH, AND DIAMETER OF EACH ANCHOR BOLT SHALL BE AS NOTED ABOVE IN DETAIL.
- ANCHOR BOLTS SHALL BE MEDIUM STRENGTH, MILD STEEL, OR ALLOY STEEL WITH MINIMUM DESIGN YIELD STRENGTH OF ASTM F1554 GRADE 55, OR 35 KSI ALLOY ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A193 GRADE B7, MEDIUM STRENGTH, MILD STEEL. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF A MODIFIED ASTM A36 (WITH 55 KSI YIELD STRENGTH), OR ASTM A372 GRADE 55.
- WELDED SPlicing OF A ROD MATERIAL FOR ANCHOR BOLTS WILL NOT BE PERMITTED.
- THREADS FOR ANCHOR BOLTS SHALL BE ROLLED OR CUT THREADS OF UNIFIED COARSE THREAD SERIES IN ACCORDANCE WITH ANSI B1.1. FOR ROLLED THREADS, THE DIAMETER OF THE UNTHREADED PORTION SHALL NOT BE LESS THAN THE MINIMUM PITCH DIAMETER NOR MORE THAN THE MAXIMUM MAJOR DIAMETER OF THE THREADS.
- ALL THREADS FOR BOLTS AND NUTS SHALL HAVE CLASS 2 FIT TOLERANCES IN ACCORDANCE WITH ANSI B1.1.

NUTS AND WASHERS

- NUTS FOR ALLOY STEEL ANCHOR BOLTS SHALL CONFORM TO ASTM A194 GRADE 2H OR ASTM A563, HEAVY HEX, GRADE 0H CLASS 12. NUTS FOR MEDIUM STRENGTH, MILD STEEL ANCHOR BOLTS SHALL CONFORM TO ASTM A194 GRADE 2H OR ASTM A563, GRADE D OR BETTER. ALL THREADS FOR NUTS SHALL HAVE A CLASS 2B TOLERANCE IN ACCORDANCE WITH ANSI B1.1. WHEN NUTS ARE TO BE GALVANIZED, THE UNTAPPED BLANKS SHALL BE GALVANIZED PRIOR TO CUTTING THE THREADS.
- EXPOSED NUTS SHALL BE GALVANIZED OR COATED WITH A ZINC-RICH COATING IF THE ANCHOR BOLTS ARE NOT GALVANIZED.
- WASHERS INSTALLED WITH ANCHOR BOLTS OF ANY TYPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F436 AND SHALL HAVE THE SAME FINISH OR COATING AS THE BOLT AND NUT.

CAISSON PROFILE

TRAFFIC SIGNAL POLE CAISSON - 48" DIA.

TRAFFIC SIGNAL POLE CAISSON - 36" DIA.

GENERAL NOTES

- DESIGN OF FOUNDATIONS IS BASED ON TRAFFIC SIGNAL POLE CONFIGURATIONS PROVIDED BY MILKOT INDUSTRIES, INC. DRAWING NO. DS00714 REV. C FOR THE CITY & COUNTY OF DENVER AND ILL. ENERGY OF COLORADO. REFER TO CITY & COUNTY OF DENVER TRAFFIC STANDARD DRAWINGS FOR ANY ADDITIONAL TRAFFIC POLE INFORMATION.
- DESIGN CRITERIA: AASHTO - STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 2001 EDITION.
- A DESIGN WIND VELOCITY OF 100 MPH HAS BEEN USED FOR THE DESIGNS HEREIN.
- ALL FOUNDATIONS ON THIS SHEET ARE FOR SINGLE MAST ARM POLES, EXCEPT AS NOTED.
- THE DESIGNS HEREIN ASSUME THAT SIGNALS ARE INSTALLED WITHIN THE ROADWAY PRISM WITH THE FOLLOWING SOIL PARAMETERS:
 SOIL DENSITY $\gamma = 110 \text{ LB./CU. FT.}$
 SOIL COHESION $c = 700 \text{ LB./SQ. FT.}$ FOR MEDIUM STIFF COHESIVE SOIL.
 SOIL ϕ ANGLE $= 30^\circ$ FOR MEDIUM DENSE COHESIONLESS SOIL.
 SF $= 1.25$ FOR TORSIONAL RESISTANCE AND 3.0 FOR FLEXURAL RESISTANCE.
- CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
 (A) SIGNALS WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM
 (B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY
 (C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG
 (D) THE FOUNDATION SOILS ARE NOT HOMOGENEOUS
 (E) FIRM BEDROCK IS ENCOUNTERED
 (F) CAVING SOILS
 (G) GROUNDWATER
 (H) EXPANSIVE SOILS
 (I) TRASH
 (J) BOTTOM OF CAISSON WILL EXTEND BELOW BOTTOM OF ANY ADJACENT BUILDING OR RETAINING WALL FOUNDATION
 (K) SLOPES GREATER THAN 10%
- CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH.
- CAISSONS SHALL BE CONSTRUCTED WITH AIR ENTRAINED CDDT CLASS B2 CONCRETE IN ACCORDANCE WITH SECTION 503 OF THE STANDARD SPECIFICATIONS. REINFORCING STEEL SHALL BE GRADE 60.
- CAISSON CONCRETE SHALL REACH THE SEVEN DAY PREDICTED STRENGTH PRIOR TO INSTALLING THE SIGNAL STRUCTURE.
- FOUNDATION TO BE PROVIDED WITH 3 CONDUIT STUB OUTS (2 - 3" & 1 - 2") DIRECTION TO BE DETERMINED BY CITY & COUNTY OF DENVER ENGINEER AND IS TO BE CONSIDERED AS PART OF THE FOUNDATION BID ITEM.
- BASE PLATE, NUTS AND NUT COVERS TO BE FURNISHED BY POLE MANUFACTURER. ANCHOR BOLTS ARE TO BE FURNISHED BY THE CONTRACTOR AND ARE INCLUDED IN THE COST OF THE FOUNDATION.
- FOUNDATION SHALL BE PAID BY THE FEET OF DEPTH DRILLED. USE OF THE SHORTER FOUNDATION FOR COHESIONLESS SOIL SHALL BE ALLOWED ONLY BY APPROVAL OF THE CDD TRAFFIC ENGINEER.
- PLUMBING OF POLES SHALL BE ACCOMPLISHED BY ADJUSTING NUTS AFTER LOADING OF MAST ARM.
- EACH END OF CAISSON TIES TO BE TERMINATED WITH A 135° HOOK AROUND A LONGITUDINAL BAR.
- DESIGN IS BASED ON A HORIZONTAL GROUND SURFACE CONDITION IN THE VICINITY OF THE CAISSON. CAISSONS SHOULD NOT BE INSTALLED AT SITES WITH A SLOPE EXCEEDING 10 PERCENT.
- LEVELING CONCRETE SHALL BE 3,000 PSI CLASS B AIR ENTRAINED CONCRETE.
- YIELD STRESS OF REINFORCING STEEL SHALL BE MINIMUM 60,000 PSI.

FOUNDATION SCHEDULE				
MAST ARM LENGTH (FT.)	CAISSON DATA			V BARS TOTAL
	DIA (IN)	DEPTH (FT)	BOLT CIRCLE DIA. (IN)	
10 TO 40	36	13.0	12.0	20 #9 11
45	36	18.0	14.0	22 #9 11
50	36	18.0	14.0	22 #9 11
55	36	18.0	14.0	22 #9 11
60	48	17.0	14.5	25 #9 18
65	48	17.0	14.5	25 #9 18
70	48	17.0	14.5	25 #9 18
40 (DBL ARM)	36	16.0	13.5	22 #9 11

CITY & COUNTY OF DENVER

SIGNAL POLE FOUNDATION

STD DWG NO 16.1.8
DATE 7/5/2011

COLORADO POLE SERIES

TABLE 1: MATERIAL DATA

COMPONENT	ASTM DESIGNATION	YIELD STRENGTH	COMPONENT	ASTM DESIGNATION	YIELD STRENGTH
POLE SHAPES - 148, 214, 268, 311, 373	A572 GR. 50	50	ANCHOR BOLTS	F1554 58	58
	A572 GR. 50	50	POLE BARS	A572 50	50
	A572 GR. 50	50	LOW ARM ATTACHMENTS	A36	36
POLE SHAPES - 3 GA.	A572 GR. 50	50	MAST ARM ATTACHMENTS	A372 50	50
	A572 GR. 50	50	MAST ARM CONNECTION BOLT	A572 50	50
POLE SHAPES - 3, 3 GA.	A572 GR. 50	50	LOW ARM CONNECTION BOLT	A36	36
	A572 GR. 50	50	GALVANIZING WASHINGS	A153	-

DESIGNATION EXAMPLE

--- DESIGN NUMBER
 --- DENVER COLORADO POLE SERIES 30

SINGLE AND DOUBLE MAST ARM RADIAL INDEX

NOTE:
 LOADS SHOWN ARE FOR DESIGN PURPOSES ONLY AND NOT FOR CONSTRUCTION. IF THESE LOADS ARE EXCEEDED PLEASE CONTACT THE ENGINEER FOR A SPECIAL DESIGN.

DESIGN CRITERIA:
 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS (A15.2) CAT 2, NO GALLOPING, 45 MPH T-GUST.

WIND VELOCITY:
 100 MPH ISOTACH

DEVICE	DESCRIPTION	PROJ. AREA (FT ²)	WEIGHT (LBS)
A	12" - 3 SEC. SIGNAL WITH SIGNPLATE	13.72	75
B	36" x 48" INSULATOR SIGN	13.60	45
C	12" - 3 SEC. SIGNAL WITH SIGNPLATE	8.87	45
D	36" x 36" INSULATOR SIGN	7.90	23
E	36" x 36" INSULATOR SIGN	8.80	27
F	DUAL 12" - 3 SEC. SIGNAL WITH SIGNPLATE	8.50	80
G	DUAL 12" - 3 SEC. SIGNAL WITH SIGNPLATE	2.35	20
H	CANOPY	1.90	30

FOUNDATION SCHEDULE				
MAST ARM LENGTH (FT.)	CAISSON DATA			V BARS TOTAL
	DIA (IN)	DEPTH (FT)	BOLT CIRCLE DIA. (IN)	
10 TO 40	36	13.0	12.0	20 #9 11
45	36	18.0	14.0	22 #9 11
50	36	18.0	14.0	22 #9 11
55	36	18.0	14.0	22 #9 11
60	48	17.0	14.5	25 #9 18
65	48	17.0	14.5	25 #9 18
70	48	17.0	14.5	25 #9 18
40 (DBL ARM)	36	16.0	13.5	22 #9 11

CITY & COUNTY OF DENVER

MAST ARM POLE LOADS

STD DWG NO 16.1.9
DATE 7/5/2011

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REVISION OF SECTION 614
TRAFFIC SIGNAL POLES

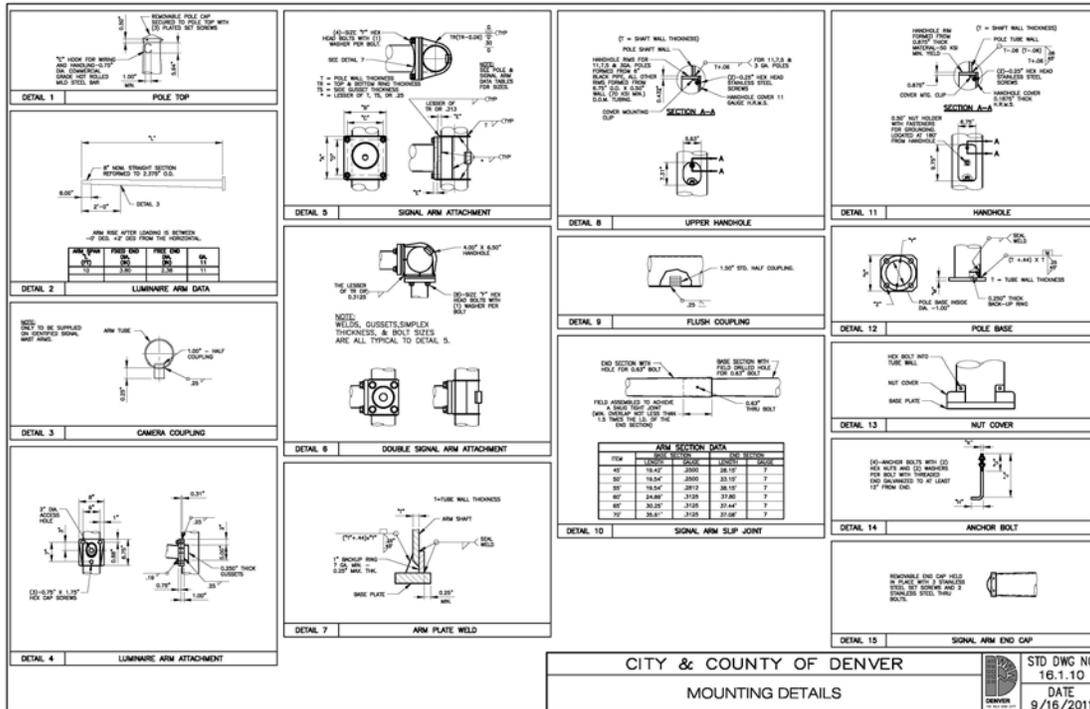


TABLE 2: POLE DATA

POLE SERIES	DESIGN NUMBER	SINGLE ARM SPAN (FT)	DOUBLE ARM SPAN		POLE TUBE				POLE BASE				ANCHOR BOLT			
			1st ARM SPAN (FT)	2nd ARM SPAN (FT)	BASE O.D. (IN)	TOP O.D. (IN)	LENGTH (FT)	THICK (IN)	SQUARE "C" (IN)	BOLT CIRCLE "C" (IN)	WELD OR SLOT "T" (IN)	SLIT "T" (IN)				
DC01	1	20,25,30,35, & 40	N.A.	N.A.	15.50	10.80	35.00	.1875	21.00	20.00	2.00	2.25	2.00	84.00	6.00	10.00
DC01	2	45,50 & 55	N.A.	N.A.	17.00	12.10	35.00	.2188	23.00	22.00	2.00	2.25	2.00	84.00	6.00	10.00
DC01	3	60,65, & 70	N.A.	N.A.	19.50	14.80	35.00	.2500	26.00	25.00	2.00	2.25	2.00	84.00	6.00	10.00
DC01	4	N.A.	20 THRU 40	20 THRU 40	15.50	10.80	35.00	.2500	23.00	22.00	2.00	2.25	2.00	84.00	6.00	10.00

TABLE 3: SIGNAL ARM DATA

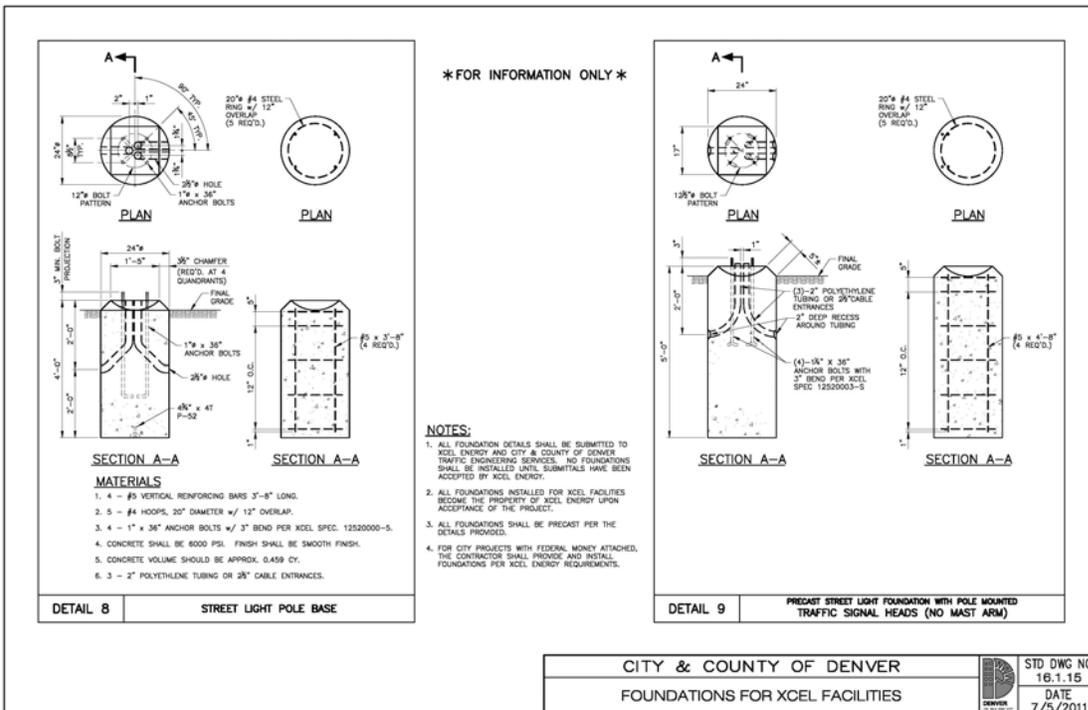
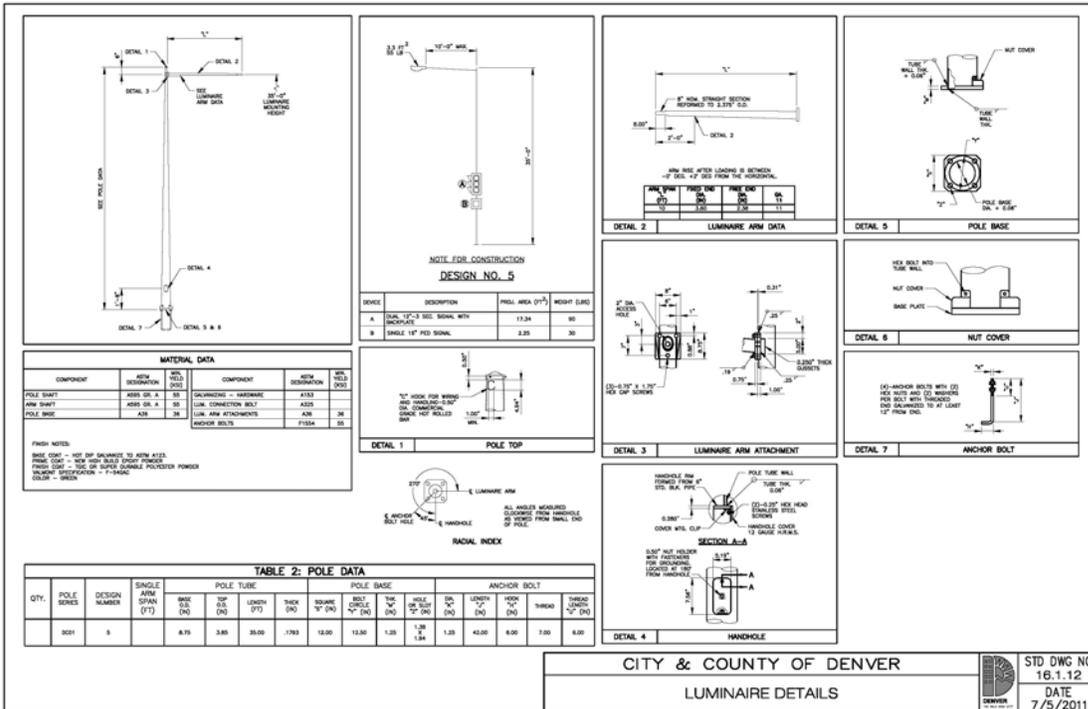
SIGNAL ARM TUBE				SIGNAL ARM SIMPLEX						
MAXIMUM ARM SPAN (FT)	FIXED END DIA (IN)	SMALL END DIA (IN)	GAUGE	A X B (IN)	C X D (IN)	THICKNESS "C" (IN)	BOLT SIZE "T" (IN)	GUSSET THICKNESS (IN)	ANGLE OF RISE IN ARM	
20.00	9.00	6.20	7	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	0.00'	
25.00	10.00	6.50	7	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	0.50'	
30.00	12.00	7.80	5	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	0.50'	
35.00	12.50	7.60	5	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	1.00'	
40.00	13.00	6.90	3	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	1.50'	
45.00	14.00	8.06	SEE DETAIL 10 SHEET 16.10	23.25 X 23.25	19.50 X 19.50	2.00	1.50 X 4.25	.500	1.50'	
50.00	15.00	8.36	SEE DETAIL 10 SHEET 16.10	23.25 X 23.25	19.50 X 19.50	2.00	1.50 X 4.25	.500	1.50'	
55.00	15.00	7.66	SEE DETAIL 10 SHEET 16.10	23.25 X 23.25	19.50 X 19.50	2.00	1.50 X 4.25	.500	2.00'	
60.00	15.75	7.71	SEE DETAIL 10 SHEET 16.10	26.25 X 26.25	22.50 X 22.50	2.00	1.50 X 4.25	.500	2.00'	
65.00	16.50	7.76	SEE DETAIL 10 SHEET 16.10	26.25 X 26.25	22.50 X 22.50	2.00	1.50 X 4.25	.500	2.00'	
70.00	17.25	7.81	SEE DETAIL 10 SHEET 16.10	26.25 X 26.25	22.50 X 22.50	2.00	1.50 X 4.25	.500	2.50'	

CITY & COUNTY OF DENVER
TABLE DATA

STD DWG NO
16.1.11
DATE
7/5/2011

MAXIMUM ARM LENGTH COMBINATION FOR DUAL CONFIGURATION ARE 40'-0" / 40'-0", ARM LENGTHS EXCEEDING THESE WILL REQUIRE A SPECIAL POLE DESIGN.

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**REVISION OF SECTION 614
 TRAFFIC SIGNAL POLES**



**REVISION OF SECTION 614
TRAFFIC SIGNAL POLES**

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 installation is prohibited. Only 3/4 inch diameter or larger nonabrasive nylon rope or equivalent nylon belting shall 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 shall be allowed until “dry through” condition has been achieved with the coating.

Delivery, Installation and Acceptance – Extra care shall be taken not to damage the coating. Upon arrival of the poles at the delivery point, neither chains nor cables shall be used to either unload or install poles.

Procedures 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 shall be clean and dry before repair application. Field touch-up will be at the direction of the pole manufacturer or their authorized representative.

Subsection 614.13 shall include the following:

Furnish of base plate(s), anchor bolts, nuts and nut covers that are required components of the traffic signal pole foundation shall be considered incidental to the Contractor’s unit price for traffic signal poles; installation of same shall be considered incidental to the pole foundation.

Furnish and installation of mast arms, luminaire arms and luminaires shall be considered included in the unit cost. All transportation and delivery costs are considered included in the unit price and will not be measured and paid separately.

For all signal poles with mast arms, pole raking and/or plumbing, and foundation grouting are considered included in the unit cost for the pole foundation under Section 503 – Drilled Caisson.

Signal poles without mast arm include a 24” diameter precast foundation included in the cost of the pole. Therefore, for all signal poles without mast arm, all required ancillary foundation work including but not limited to raking, plumbing and grouting, shall be included in the cost of the pole and will not be measured and paid separately.

Foundations for poles with no mast arm (reference attached drawing number 16.1.15, “Foundations for XCEL Facilities”) shall be installed by the Contractor. All such foundations shall be considered included in the unit cost for the pole and will not be measured and paid for separately. All signal poles with mast arms similarly require a Contractor-installed foundation, however, those foundations will be measured and paid separately under Section 503 as Drilled Caissons of the specified diameter.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Traffic Signal-Light Pole Steel	Each
Traffic Signal-Light Pole Steel (1 Mast Arm)	Each
Traffic Signal-Light Pole Steel (2 Mast Arm)	Each
Traffic Signal-Light-Span Wire Pole (16 Inch)	Each

**End Revision of Section 614
Traffic Signal Poles**

-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 the fan-out and termination of fiber optic cable at each controller cabinet location as identified in the plans. Work also includes furnish and installation of all necessary telemetry equipment including but not limited to optical splice closures, field patch panels, splice organizers, strain relief, pigtails and jumpers, cables, connectors and labels. Essentially, all work including labor and materials to re-establish signal system communications in accordance with the plans and specifications is considered included in the unit cost.

At each cabinet, only those fibers identified in the plans to be 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 cable manufacturer and coiled neatly in a splice organizer.

Color-coded fibers and buffer tubes shall be used throughout the project. At terminal ends the jackets shall be stripped and the ends taped. Gel filled compound shall be removed using filled cable cleaner.

The same color-coded pairs of fibers and/or wires shall be used throughout the project on lateral cable unless otherwise shown in the plans or directed by the Denver Traffic Engineering Services Division (TES). For those intersections where new lateral-to-backbone splices are provided at new locations on the backbone, the Contractor shall use those color-coded backbone fiber pairs as directed by Denver TES.

Subsection 614.08 shall include the following:

Within this Project Special Provision, the abbreviation "SM" shall indicate single mode fiber optic cable. Similarly, the abbreviation "MM" shall represent multi mode fiber optic cable.

Fiber Optic Pigtail Cables

The fiber optic pigtail cables shall consist of SM or MM fibers housed individually in protective jackets. Both ends of the cable shall be connected. Cable shall be suitable for operation over a temperature range of -30° to +60° C. Cables shall be of suitable length to connect between the interconnect panel and the communications equipment (i.e. the Ethernet switch or fiber optic transceivers as applicable). 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 within the existing cabinet. Attenuation of a pigtail cable after installation, not including the connector loss, shall not exceed 0.1dB measured at 850nm and 1300nm for MM; or 0.1dB measured at 1310nm and 1550nm for SM.

Connectors

The connector shall be an AT&T ST style compatible field mounted connector including a ceramic ferrule with a nickel-plated nut and body.

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 -25dB. Return loss when the connector is mated with previously installed connectors shall be less than -18dB.

Connector insertion loss shall not be greater than 0.20dB (typical). Connector loss shall not vary more than 0.20dB after 1000 repeated matings. Tensile strength shall withstand an axial load of 20lb with less than 0.20dB change.

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

Index matching fluids or gels shall not be used. 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:

- A] Operating Temperature: -40° to +80° C.
- B] Storage Temperature: -40° to +85° C.

Connector loss shall not vary more than 0.20dB over the operating temperature range. Connectors shall be protected by a suitably installed waterproof protection cap.

Ethernet Managed Field Switch

See the stand-alone Project Special Provision. This item shall be furnished to the Contractor by the City and County of Denver and installed by the Contractor as part of Telemetry (Field). Contact Joe Strauss at 720-865-4062 or Chris Lillie at 720-865-4066 for coordination regarding Ethernet switches.

Miscellaneous Cabling

Fiber optic patch cords shall be fiber optic jumper cable, duplex, ceramic ferrule, yellow-jacketed SM 8.3/125nm or orange-jacketed MM 62.5/125nm, adaptable to ST style connectors, 2 meters in length, ITT Canon Model 161001-4020 or approved equal. Cable from fiber optic modem or Ethernet switch to Port 3 controller harness shall be 25-pin cable Model 44982G4 or approved equal.

In-cabinet cable ties and strain relief shall be provided in accordance with the plan details and cable manufacturer's recommendation.

Fiber Optic Cable and Optical Splice Closures

Refer to the stand-alone Project Special Provision for Fiber Optic Cable and Test Fiber Optic Cable for material and installation information related to interconnect cable and items ancillary thereto. All work to furnish, install and test Fiber Optic Cable will be included in the project under Telemetry (Field).

Subsection 614.10 shall include the following:

Removal of existing lateral fiber optic interconnect cable and existing cabinets, including all in-cabinet telemetry equipment, shall be accomplished under the lump sum payment for Item 202 – Removal of Traffic Signal Equipment.

Typically, lateral cable from outside terminates inside existing cabinets on a wall- or rack-mounted patch panel; from which patch cords relay optical communications to the transceiver (modem) or Ethernet switch, which connects directly to the controller. The following section is written to that configuration.

- a. The following subsection summarizes the required work at one (1) cabinet location:

- 1. 1. Alameda Avenue and Clay Street

Existing lateral cable runs from a splice box on the southeast corner to the northwest corner cabinet using the diagonal span wire. The lateral shall be removed and disposed of and replaced with a new underground lateral in new conduit. The remaining in-cabinet telemetry hardware consisting of but not limited to modem, patch panels, patch cords, and fiber optic connectors shall be salvaged and delivered to the City accordingly.

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

Re-splice new lateral to existing backbone and extend to new cabinet via new underground conduit. Terminate cable on new patch panel and establish all required system-level connections.

Install telemetry equipment at new cabinet to facilitate termination including but not limited to: new patch panel (number of bulkheads as specified in the plans), new Ethernet switch (furnished by the City), pigtails, patch cords, connectors, cable ties, harnesses and strain relief.

The existing backbone running east/west between Federal and Zuni crosses the south intersection leg and Contractor's work includes replacement of communications pull boxes containing the splice enclosures. Contractor shall therefore take specific precautions to protect, safeguard and maintain function of the backbone cable throughout the construction period. Labor and materials to safeguard existing telemetry hardware shall be included in the work.

b. The following summarizes the work required at one (1) cabinet location:

1. Alameda Avenue and Lipan Street

See the plans for an illustration of the 2012 CDOT project (preceding this contract) that will reconstruct the northeast corner at this location and install new conduit across the north, east and south intersection legs.

Full cut and re-splice of the backbone is required in addition to new backbone-to-lateral splice. Backbone cut and splice is required to re-route the backbone into new conduit installed in the CDOT project immediately preceding this contract – thereby removing it from being impacted by future CDOT construction stages along the south side of Alameda. Contractor shall cut backbone on either the southeast or southwest corner, as approved by Denver TES. Both cable ends shall be pulled back into upstream pull boxes. Ends of the severed cable shall be wrapped, coiled and protected in pull box or other enclosed space until re-splice is undertaken.

Prior to cutting backbone, disconnect fiber optic laterals from cabinet and remove same. Existing lateral cable runs from a splice box on the southeast corner to the northwest corner cabinet using the diagonal span wire. The lateral shall be removed and disposed of and replaced with a new underground lateral in new conduit to the new cabinet to be set on the northeast corner. The remaining in-cabinet telemetry hardware consisting of but not limited to modem, patch panels, patch cords, and fiber optic connectors shall be salvaged and delivered to the City accordingly.

Installation work includes pulling severed backbone back through CDOT-installed conduit and providing backbone-to-backbone re-splice; installing new lateral cable from backbone to cabinet and providing backbone-to-lateral re-splice. If previous lateral splice is not in utile location after re-pull of backbone, Contractor may need to re-splice to different strands than previous condition, meaning adjustments to patch panels upstream and downstream may be required to restore existing communications channel, which would be considered included in the work for this item. All such modification work shall be coordinated with Denver TES through the Engineer prior to modifying communication channels at upstream or downstream intersections.

Install telemetry equipment at new cabinet to facilitate termination including but not limited to: new patch panel (number of bulkheads as specified in the plans), new Ethernet switch (furnished by the City), pigtails, patch cords, connectors, cable ties, harnesses and strain relief.

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

c. The following summarizes the required work at one (1) cabinet location:

1. Alameda Avenue and Platte River Drive (PRD)

See the plans for an illustration of the 2012 CDOT project (preceding this contract) that will close the north leg at this location and convert it to a "T" intersection. The existing backbone conduit will remain and cross the previous north leg and the west leg.

Existing lateral cable runs from a splice box on the southwest corner to the southwest corner cabinet. The lateral shall be removed and disposed of. The remaining in-cabinet telemetry hardware consisting of but not limited to modem, patch panels, patch cords, and fiber optic connectors shall be salvaged and delivered to the City accordingly.

A new lateral-to-backbone splice shall be provided at the northwest corner pull box, with the new lateral extended to the new controller location in new conduit on the northwest corner. Terminate cable on new patch panel and establish all required system-level connections. Install telemetry equipment at new cabinet to facilitate termination including but not limited to: new patch panel (number of bulkheads as specified in the plans), new Ethernet switch (furnished by the City), pigtailed, patch cords, connectors, cable ties, harnesses and strain relief.

Due to new splice location, Contractor may need to re-splice to different backbone strands than previous condition, meaning adjustments to patch panels upstream and downstream may be required to restore existing communications channel, which would be considered included in the work for this item. All such modification work shall be coordinated with Denver TES through the Engineer prior to modifying communication channels at upstream or downstream intersections.

The existing backbone crosses the north and west intersection legs and Contractor's work includes replacement of communications pull boxes containing the splice enclosures. Contractor shall therefore take specific precautions to protect, safeguard and maintain function of the backbone cable throughout the construction period. Labor and materials to safeguard existing telemetry hardware shall be included in the work.

d. The following summarizes the required work at one (1) cabinet location:

1. Sheridan Blvd. and US-285 Southbound Ramps (North Intersection)

Disconnect existing fiber optic communications cable at cabinet and pull same into upstream communications junction box or boxes prior to removing the existing cabinet. All such cabling shall be bundled, protected, safeguarded and placed in said junction box for the duration of the cabinet change-out period. Patch panel, patch cords, fiber optic modem and all ancillary connectors, cabling, strain relief, and other hardware shall be salvaged and delivered to the City accordingly.

When new cabinet is installed, pull lateral back into new cabinet. Terminate cable on new patch panel and establish all required system-level connections.

Contractor shall install new patch panel into new cabinet as directed by the Engineer, install Ethernet switch (furnished by the City) and reinstall patch cords between patch panel and switch. Pull existing lateral fiber optic cable into new cabinet and terminate same on patch panel, and re-establish all required system-level connections. Work to disconnect, pull and bundle cable at removal, and re-pull and reconnect cable shall be considered included in the unit price for Telemetry (Field) and will not be measured and paid separately.

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

The existing backbone crosses the north and west intersection legs and Contractor's work includes replacement of communications pull boxes. Contractor shall therefore take specific precautions to protect, safeguard and maintain function of the backbone cable throughout the construction period. Labor and materials to safeguard existing telemetry hardware shall be included in the work.

- e. The following summarizes the required work at one (1) cabinet location:
 - o Sheridan Boulevard and 25th Avenue/Byron Place

Note that the Sheridan/25th/Byron location is at the south terminus of a fiber optic backbone run proceeding north, and that the interconnect cable entering the cabinet is a backbone cable instead of the usual fewer-strand lateral.

Disconnect existing fiber optic communications cable at cabinet and install new communications pull box on northeast corner. All such cabling shall be bundled, protected, safeguarded and placed in existing junction box for the duration of the cabinet change-out. Patch panel, patch cords, fiber optic modem and all ancillary connectors, cabling, strain relief, and other hardware shall be salvaged and delivered to the City accordingly.

A new lateral-to-backbone splice shall be provided at the northeast corner pull box, with the new lateral extended via new conduit to the new controller location on the southeast corner. Terminate cable on new patch panel and establish all required system-level connections. Install telemetry equipment at new cabinet to facilitate termination including but not limited to: new patch panel (number of bulkheads as specified in the plans), new Ethernet switch (furnished by the City), pigtails, patch cords, connectors, cable ties, harnesses and strain relief.

Contractor shall take specific precautions to protect, safeguard and maintain function of the backbone cable throughout construction. Labor and materials to safeguard existing telemetry hardware shall be included in the work.

- e. The following summarizes the required work at one (1) cabinet location:
 - i. Sheridan Boulevard and US-285 Northbound Ramps (South Intersection)

Full cut and re-splice of the backbone is required in addition to backbone to new lateral splice. Contractor shall cut backbone at the southwest corner as directed by the Engineer. North backbone cable leg shall be pulled back into communications box on remote northwest corner (far side of right turn bypass lane). Cable ends shall be wrapped, coiled and protected until re-splice is undertaken. Prior to cutting backbone, disconnect fiber optic laterals from cabinet and remove same. Patch panel, patch cords, fiber optic modem and all ancillary connectors and other communications-related hardware shall be likewise removed and salvaged for delivery to the City accordingly.

Installation work includes pulling severed backbone back to southwest corner and providing backbone-to-backbone re-splice; providing new lateral cable from backbone to cabinet and providing backbone-to-lateral re-splice. If previous lateral splice is not in utile location after re-pull of backbone, Contractor may need to re-splice to different strands than previous condition, meaning adjustments to patch panels upstream and downstream may be required to restore existing communications channel, which would be considered included in the work for this item. All such modification work shall be coordinated with Denver TES through the Engineer prior to modifying communication channels.

**REVISION OF SECTION 614
TELEMETRY (FIELD)**

Install telemetry equipment at new cabinet to facilitate termination including but not limited to: new patch panel (number of bulkheads as specified in the plans), new Ethernet switch (furnished by the City), pigtails, patch cords, connectors, cable ties, harnesses and strain relief.

Materials, installation and testing of cable shall comply with the stand-alone Project Special Provisions for Fiber Optic Cable and Test Fiber Optic Cable as applicable.

Subsection 614.13 shall include the following:

Telemetry (Field) shall be measured by the total number of new cabinets at which the work is required as shown in the plans and as described herein and shall include all labor and materials required to furnish, install, fan out, terminate and connect fiber optic cable to the controller. All in-cabinet communications hardware – including but not limited to cable ties and strain relief, pigtails and harness cables, interconnect centers and/or fiber optic interface panels, connectors, adaptors, jumpers, patch panels and patch cords; and all other ancillary in-cabinet items required establish field communications to the satisfaction of the Engineer are considered included.

Where existing lateral cable is to be removed and disposed of, the cost of this activity shall be considered included in the cost for Item 202 - Removal of Traffic Signal Equipment.

Installation of new Ethernet switch furnished by the City is included in the unit cost for Telemetry (Field)..

If cutting, safeguarding and splicing of the backbone cable is required in the plans, all labor and materials required to accomplish the activity and restore successful backbone communications shall be included in the unit price.

New lateral fiber optic cable, splices, splice enclosures and cable testing – essentially all communications system work external to the new cabinets, shall also be included in the unit cost for Telemetry (Field).

If the assistance of a fiber optic specialist is required to facilitate the Contractor’s work, the cost of providing such a specialist shall be considered included in the unit price for this item and will not be measured and paid for separately.

If modification of existing communications channels is required through patch panel re-routing at upstream or downstream cabinets, such work is considered included in the work and will not be measured and paid separately.

Subsection 614.14 shall include the following:

<i>Pay Item</i>	<i>Pay Unit</i>
Telemetry (Field)	Each

**End Revision of Section 614
Telemetry (Field)**

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**REVISION OF SECTION 614
FIBER OPTIC CABLE**

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 furnish, installation, splicing and testing of hybrid multimode/single mode fiber optic cable in existing or new conduit as specified herein and in general conformance with the plans. All labor and materials required to furnish, install, break-out, fan-out, terminate and splice fiber optic cables at individual cabinets are included.

Work under this Project Special Provision shall be considered included in the cost for Telemetry (Field) and will not be measured and paid separately.

Backbone and lateral cables shall be installed in continuous runs except where maximum pull lengths govern. Manufacturer's recommended limits for cable pull lengths shall govern.

The number denoted prior to the "MM" designator identifies the number of multimode fibers (strands) in the cable. The number denoted prior to the "SM" designator identifies the number of single mode fibers (strands) as designated in the plans. This project requires installation of lateral cable consisting of both SM and MM fibers. Fiber optic cable of the indicated types shall be installed on this project at the following locations.

Alameda & Clay: Furnish and install lateral cable consisting of 6SM/6MM strands (12 total strands) through new conduit from the fiber splice box on the southeast corner to the proposed new cabinet location. A new splice is required although the existing splice location along the backbone will remain.

Alameda & Lipan: Full cut and splice of backbone cable is required at this location. Also, furnish and install lateral cable consisting of 6SM/6MM strands (12 total strands) through new conduit from fiber splice box on the southeast corner to the proposed new cabinet location. A new backbone to lateral splice is required at a new location along the backbone.

Alameda & Platte River Drive: Furnish and install lateral cable consisting of 6SM/6MM strands (12 total strands) through new conduit from fiber splice box on the northwest corner to the proposed new cabinet location. A new splice is required at a new location along the backbone.

Sheridan & US-285 Northbound Ramps (South Intersection): Full cut and splice of backbone cable is required at this location. Also, furnish and install new lateral cable consisting of 6SM/6MM strands (12 total strands) through new conduit from the fiber splice box on the northwest island to the proposed new cabinet location. A new backbone to lateral splice is required at a new location along the backbone.

Sheridan & US-285 Southbound Ramps (North Intersection): Existing lateral cable is expected to be re-connected to the proposed cabinet; no new cable or splices are therefore anticipated.

Sheridan & 25th/Byron Place: Furnish and install new lateral cable consisting of 6SM/6MM strands (12 total strands) through new conduit from the fiber splice box on the northeast corner to the proposed new cabinet location on southeast corner.

Test and Acceptance

The Contractor shall be required to demonstrate successful end-to-end data communications to the Engineer as a requirement of acceptance of the fiber installation work. All labor and materials required to test the existing and new fiber optic cable shall be included in the cost for Telemetry (Field) and will not be paid for separately. See the applicable Project Special Provision.

**REVISION OF SECTION 614
FIBER OPTIC CABLE**

Subsection 614.08 shall include the following:

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 general design requirements and performance standards for fiber optic cables intended primarily for use in outside plant environments. 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 City & County of Denver traffic signal system communications 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 & County of Denver through the Engineer.

1.0 Cable Core Characteristics:

1.1 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.

1.2 Color Code. The individual colors for fibers and buffer tubes in loose tube cable cores should comply with EIA/TIA-598 as given in Table 1.

Table 1 – Fiber and Tube Color Code

Fiber or Tube No.	Color	Tube No.	Color
1	Blue (BL)	13	Blue-Dash (BL-DS)
2	Orange (OR)	14	Orange-Dash (OR-DS)
3	Green (GR)	15	Green-Dash (GR-DS)
4	Brown (BR)	16	Brown-Dash (BR-DS)
5	Slate (SL)	17	Slate-Dash (SL-DS)

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FIBER OPTIC CABLE**

6	White (WH)	18	White-Dash (WH-DS)
7	Red (RD)	19	Red-Dash (RD-DS)
8	Black (BK)	20	Black-Dash (BK-DS)
9	Yellow (YL)	21	Yellow-Dash (YL-DS)
10	Violet (VI)	22	Violet-Dash (VI-DS)
11	Rose (RS)	23	Rose-Dash (RS-DS)
12	Aqua (AQ)	24	Aqua-Dash (AQ-DS)

1.3 *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 or hybrid cable designs when both SM and MM fibers are contained within the same cable, the SM fibers will be contained in the first buffer tubes. The MM fibers will be contained in the sequenced MM buffer tubes following the SM 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.

1.4 *Filler Rods* – 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.

1.5 *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.

2.0 Cable Sheath Characteristics

Sheaths described in this section are:

i] All-Dielectric Single Jacket: one polyethylene jacket, no metallic elements (SJ)

2.1 *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).

**REVISION OF SECTION 614
FIBER OPTIC CABLE**

- 2.2 *Inner Jacket* - An inner polyethylene jacket over the core is applied for the DJ/SA design.
- 2.3 *Steel Armor* - The SJ/SA and DJ/SA designs should contain a corrugated, co-polymer coated carbon steel (ECCS) tape applied longitudinally to provide mechanical protection against rodent damage.

The steel tape is coated on both sides, and bonds to the outer jacket but can still be easily removed during fiber splicing. It is applied over the core for SJ/SA designs, and over the inner jacket for DJ/SA designs. The armor must also contain a layer of water blocking material already laminated to it in order to avoid the use of additional water blocking tapes.

- 2.4 *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.

- 2.5 *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.

2.6 *Cable Cross-Sections*

2.6.1 Single Jacket (SJ)

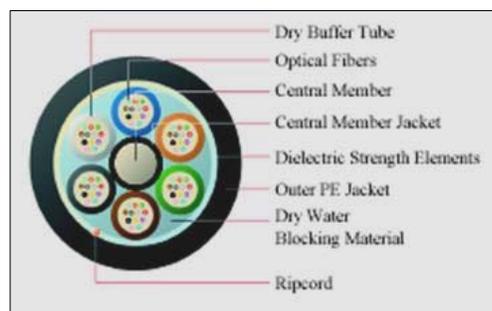


Figure 1 – Single Jacket

Table 3 – Target Cable Outer Diameters

SHEATH TYPE	# 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.)
	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)

3.0 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.

**REVISION OF SECTION 614
FIBER OPTIC CABLE**

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)

- 3.1 *Single Mode (SM) Fibers* - Per Telcordia GR-20, magnitude of the attenuation change shall be less than or equal to 0.05dB for 90% of the test fibers and less than or equal to 0.15dB for the remaining 10%. Cable aging allows 0.10dB/km average attenuation change with a magnitude of the maximum attenuation change for each individual fiber to be less than 0.25dB/km.

Table 4 – Testing for Single Mode Fibers

Cable Test	Test Method	Requirement
Tensile Loading & Bending	EIA/TIA-455-33; IEC 794-1-E1	90% < 0.05dB Max. Added Loss; 100% < 0.15dB Max. Added Loss
Cyclic Flexing	TIA/EIA-455-104; IEC 794-1-E6	90% < 0.05dB Max. Added Loss; 100% < 0.15dB Max. Added Loss
Cyclic Impact	EIA/TIA-455-25; IEC 794-1-E4	90% < 0.05dB Max. Added Loss; 100% < 0.15dB Max. Added Loss
Compressive Loading	TIA/EIA-455-41; IEC 794-1-E3	90% < 0.05dB Max. Added Loss; 100% < 0.15dB Max. Added Loss
Twist	TIA/EIA-455-85; IEC 794-1-E7	90% < 0.05dB Max. Added Loss; 100% < 0.15dB Max. Added Loss
Low & High Temperature Bend	EIA/TIA-455-37; IEC 794-1-E11	90% < 0.05dB Max. Added Loss; 100% < 0.15dB Max. Added Loss
External Freezing	EIA/TIA-455-98; IEC 794-1-F6	< 0.05dB Mean Added Loss; < 0.15dB Max. Added Loss
Temperature Cycling	EIA/TIA-455-3; IEC 794-1-F1	<input type="checkbox"/> 0.05dB/km Mean Added Loss; <input type="checkbox"/> 0.15dB/km Max Added Loss
Cable Aging	EIA/TIA-455-3; IEC 794-1-F1	<input type="checkbox"/> 0.10dB/km Mean Added Loss; <input type="checkbox"/> 0.25dB/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

These attenuation values include a 0.05dB 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.

- 3.2. *Multimode (MM) Fibers* - Per Telcordia GR-20, allowable attenuation increase during the mechanical and environmental testing is 0.20dB. 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/Bending	EIA/TIA-455-33; IEC 794-1-E1	0.20dB Max. Mean Added Loss
Cyclic Flexing	TIA/EIA-455-104; IEC 794-1-E6	0.20dB Max. Mean Added Loss

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Cyclic Impact	EIA/TIA-455-25; IEC 794-1-E4	0.40dB Max. Mean Added Loss
Compressive Loading	TIA/EIA-455-41; IEC 794-1-E3	0.20dB Max. Mean Added Loss
Twist	TIA/EIA-455-85; IEC 794-1-E7	0.20dB Max. Mean Added Loss
Low/High Temperature Bend	EIA/TIA-455-37; IEC 794-1-E11	0.40dB Max. Mean Added Loss
External Freezing	EIA/TIA-455-98; IEC 794-1-F6	0.20dB Max. Mean Added Loss
Temperature Cycling	EIA/TIA-455-3; IEC 794-1-F1	<input type="checkbox"/> 0.5 dB/km Max Added Loss; 80 % <input type="checkbox"/> 0.25 dB/km Added Loss
Cable Aging	EIA/TIA-455-3; IEC 794-1-F1	<input type="checkbox"/> 1.0 dB/km Max Added Loss; 80 % <input type="checkbox"/> 0.5 dB/km Added Loss
Water Penetration	EIA/TIA-455-82; IEC 794-1-F5	No flow after 1 hour from 1m length of cable

Note: The tensile rating for all of the cables described should be 2.7kN (600lbf), with a compression rating of at least 220N/cm under GR-20 requirements.

4.0 Cable Marking

4.1 *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 2mm should facilitate adequate readability. An occasional illegible marking is permitted if there is a legible marking on either side.

4.2 *Markings* - The cable shall be sequentially marked at one meter, or two-foot intervals depending on specific requirements issued by the City 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) "

4.3 *Re-Markings* - Only one remarking is permitted. If required, either of the following methods for remarking shall be used:

Method A: Completely remove defective marking and re-mark characters with the original color.

Method B: Leave the defective marking on the jacket and re-mark 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.

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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.

5.0 Cable Packaging

5.1 *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.

5.2 *Reel Labels* -Each wooden reel shall be permanently marked with the following information:

“(Manufacturer’s name)” (red paint);
“OPTICAL CABLE” (black paint);

Arrow and the words “CABLE END” to indicate position of the outside cable end (red paint);
Arrow and the words “ROLL THIS WAY” to indicate direction reel should be rolled to prevent loosening (black paint); and
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.

5.3 *Reel Lagging*

5.3.1 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.

5.3.2 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.



Figure 2 – Reel Stickers

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5.4 *Other*

5.4.1. 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 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 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 metallic protection rings, plywood covers, or other.

5.4.2 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.

5.4.3 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:

- 1] Cable Number
- 2] Date
- 3] Customer Name
- 4] Ordered Length
- 5] Customer Order Number
- 6] Ship Length
- 7] Customer Cable Code
- 8] Customer Reel Number
- 9] Customer’s Attenuation Specification(s)
- 10] Number of Fibers
- 11] Cable Construction
- 12] Fiber Transmission Data
- 13] Bandwidth Data – only applies to Multi-Mode Fibers
- 14] Authorized Signature

5.4.4 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:

- 1] Cable Number
- 2] Date
- 3] Customer Name
- 4] Ordered Length
- 5] Customer Order Number
- 6] Ship Length
- 7] Customer Cable Code
- 8] Customer Reel Number
- 9] Customer’s Attenuation Specification(s)
- 10] Number of Fibers
- 11] Beginning and Ending Sequential Length Markings
- 12] Gross Weight
- 13] Net Weight
- 14] Inspected By Signature

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6.0 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.

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.

7.0 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.

8.0 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.

9.0 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.

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**REVISION OF SECTION 614
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Subsection 614.10 shall include the following:

Contractor shall provide the Engineer with two copies of the cable manufacturer's installation instructions. All installation shall be in accordance with these practices except as otherwise directed by the Engineer. Additional cable costs due to damage caused by Contractor neglect of recommended procedures shall be the Contractor's responsibility. Backbone and lateral cable shall be installed in continuous runs except where cable type changes or where maximum pull lengths govern. Manufacturer's recommended limits for cable pull lengths shall not be exceeded. Cable ends shall be spliced and/or stored in pull boxes as indicated in the plans or as directed by the Engineer.

All cable to be installed on this project is a 6SM/6MM cable defined hereinafter as "lateral" cable. Lateral cable shall be installed in continuous runs between field cabinets as shown in the plans. Five such runs are included:

- 1] Alameda & Clay from splice box to controller;
- 2] Alameda & Lipan from splice box to controller;
- 3] Alameda & Platte River Drive from splice box to controller;
- 4] Sheridan & US-285 Northbound Ramps (south intersection) from splice box to controller; and
- 5] Sheridan & 25th/Byron from splice box to controller.

New field splices are required between backbone and lateral cable at these locations.

In addition, the Contractor is required to cut and later restore the backbone cable at Sheridan & US-285 Northbound Ramps (south intersection); therefore one backbone-to-backbone splice is also required.

At all cabinet locations, Contractor shall terminate the required number of lateral cable fibers from each cable run on the patch panel. Specific fibers shall be landed or terminated at these locations as depicted in the plan details.

Adjustments to existing daisy chaining of the system if required shall be accomplished at the patch panel. If additional adjustments are required to the daisy chain at locations upstream or downstream of the cabinet in question to restore communications, labor and materials for that work are considered included in the unit cost for this item.

Under no circumstance shall fibers be cut or spliced at intermediate points not described in the plans or herein without the express written direction of the Engineer.

Cable shall be installed using appropriate strain relief in the cabinet (through cable ties) at a minimum of three locations.

Contractor shall furnish and install all connector panels, connectors, adaptors, jumpers and/or pigtails required to establish the required equipment and cable connections.

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 filling 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.

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The same color-coded pairs of fibers and/or wires shall be used throughout the entire project unless otherwise shown in the plans or directed by the Engineer.

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 cabinets or splice closures. All other fibers shall be left uncut or sealed as appropriate in a manner recommended by the cable manufacturer.

Cable shall be installed in new or existing conduit as shown in the plans. The Contractor shall leave a minimum of 30 feet coiled and laced slack lateral cable in each traffic signal controller cabinet; a minimum of 50 feet coiled and laced slack cable in the pull box adjacent to the signal or field device cabinet and shall leave a minimum of 50 feet coiled and laced slack cable in all other pull boxes along the cable alignment.

Fiber optic cable shall be transported to the 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 at no additional compensation.

The Contractor shall ensure cable length is sufficient to allow for connection between the communications equipment and 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.

All fiber optic cables installed in this project shall be checked for communications integrity before and after installation in accordance with the Project Special Provision for Test Fiber Optic Cable.

Installation shall be done in accordance with EIA/TIA standards and the fiber manufacturer's recommendations. Contractor shall provide that cable bends do not exceed the proper bending radius during installation.

Where fiber optic cables are to be installed in inner duct, the Contractor shall secure each section of conduit to prevent duct from being pulled with the cables.

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 conduit shall be removed by forcing compressed air through the conduit before installing cable. A manufacturer recommended lubricant shall be applied to the cable to reduce friction between the cable and duct or conduit. During pulling, the cable shall be continuously lubricated as it enters the conduit. The Contractor shall use only approved pulling lubricants as recommended by the cable manufacturer. Liquid detergent shall not be used as a lubricant.

The fiber optic cable shall be pulled in the conduit with a split mesh cable grip designed to provide a firm hold on the exterior covering of the cable without force being directly applied to the optical fibers. 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 maintenance access locations.

Mechanical aids and pulling cable or ropes shall be used as required.

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FIBER OPTIC CABLE**

The Contractor shall ensure that the tensile load on the cable does not exceed the manufacturer's recommended maximum by using a pulley system with numerical readout of the actual tension on the cable and including a means of alerting the installer when the pulling tension approaches the manufacturer's maximum recommended pulling tension. The Contractor may supplement this procedure with a breakaway tension limiting device set below the lowest recommended tensile limit of the cables being pulled.

In no case shall the Contractor install new cable in existing conduit such that the requirements of the National Electric Code are violated following installation as they pertain to amount and/or number of conductors in underground conduit.

If new fiber optic cable is to be installed in existing conduit, the Contractor shall be responsible for preventing damage to the existing equipment and circuitry, including fiber optic cables and wiring. The Contractor shall repair or replace any such circuitry damaged by actions of the Contractor at no additional cost to the project and as approved by the Engineer.

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 access, cabinet, pedestal, communications pull 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.

The Contractor shall perform operational tests as required to ensure the existing equipment and circuitry is in proper working order after the installation of any new cable. This work shall be considered subsidiary to the installation of fiber optic cable and no additional payment will be made.

Blowing cable is an acceptable alternative. If the Contractor chooses to use this method, submittals for cable installation shall be submitted to the Engineer along with complete documentation on the proposed fiber installation equipment.

Fiber optic cable will connect directly to the appropriate controller(s) or field device(s) shown in the plans. Labor and materials required to establish the connection will be included in the cost for Telemetry (Field).

Fiber optic cable shall be neatly coiled and clearly tagged and labeled at each pull box and all locations where fiber is exposed. Cable tags and labels for the project shall be as follows: *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 (provided by the Engineer), 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 and so on.*

Lateral fiber optic cable shall be installed in new or existing conduit, or along existing span wire, as depicted in the plans. Lateral fiber optic cable shall be clearly tagged and labeled as such at pull boxes and all other locations where 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.

At the terminal points the jackets shall be stripped and the ends taped. Gel filling compound shall be removed using filled cable cleaner.

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REVISION OF SECTION 614
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Subsection 614.13 shall include the following:

Fiber Optic Cable will not be measured and paid separately but shall be considered included in the pay item under Section 614 for Telemetry (Field). The item shall include all labor and materials required for installation through conduits or along span wire to all pull boxes, cabinets, manholes, closures or other facilities specified in the plans.

Labor and materials required for transporting, furnishing, splicing, installing and testing the cable is similarly included in the unit price for Telemetry (Field) – essentially all labor and materials required for communications system installation external to the proposed field cabinets. The following items are therefore included in the unit cost for Telemetry (Field):

- 1] Fiber optic cable (transport, furnish, installation and test);
- 2] All required fan-out kits, kit tools, ancillary hardware and labor to accomplish the break out and fan-out at the cabinet and/or at the splice location;
- 3] All required in-cabinet cable ties and strain relief (including ancillary hardware and labor to complete);
- 4] All required pigtailed and harness cables;
- 5] All required field splices and splice enclosures;
- 6] All required interconnect centers, patch panels and fiber optic interface equipment required in the new field cabinets;
- 7] All required termination enclosures (including specified features), connectors, adaptors, jumpers, pigtailed, patch cord cables, ancillary hardware and labor required to accomplish the cabinet termination; and
- 8] All other labor and materials required to complete the item to the satisfaction of the Engineer.

If the assistance of a fiber optic specialist is required to facilitate completion of the communications system, the cost of such assistance shall be considered included in the work and will not be measured and paid separately.

Managed Ethernet Field Switches will be furnished by the City and installed by the contractor as part of Telemetry (Field).

Removal and disposal of existing communications cable is included in the cost for Removal of Traffic Signal Equipment and is not included in the unit cost for Telemetry (Field).

Adjustments to existing daisy chaining of the system if required shall be accomplished at the patch panel. If additional adjustments are required to the daisy chain at locations upstream or downstream of the cabinet in question to restore communications, labor and materials for that work is considered incidental to the project and will not be measured and paid separately.

Prior to disconnection of existing laterals, Contractor shall demonstrate to the Engineer that existing signal system communications are in working order. Following reset and reconnection of all equipment, Contractor shall test the communications system and demonstrate successful system communications to the Engineer prior to acceptance of the Telemetry (Field) item for payment.

All new splices or replacement splices called out in the plans or herein shall be included.

End Revision of Section 614
Fiber Optic Cable

**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 shall include the following:

TEST FIBER OPTIC CABLE

For this project, work shall consist of the testing of hybrid single mode (SM) / multimode (MM) fiber optic cable as shown and tabulated in the plans. The testing procedures involve an OTDR test and an Optical Power Meter Test. Guidelines for fiber optic cable testing include:

- [1] Test jumpers and patch cords must be of the same fiber core size and connector type as the cable system: a] MM fiber 62.5/125nm; b] SM fiber 8.3/125nm.
- [2] The light source and OTDR must operate within the range of 850±30nm or 1300±20nm for MM testing in accordance with ANSI/EIA/TIA-526-14; and within the range of 1310±10nm or 1550±20nm for SM testing in accordance with ANSI/EIA/TIA-526-7.
- [3] The power meter and the light source must be set to the same wavelength during testing.
- [4] The power meter must be calibrated and traceable to the requirements of the National Institute of Standards and Technology (NIST).
- [5] All system connectors, adapters and jumpers must be cleaned as per manufacturer's instructions before measurements are taken.

A. Fiber Optic Cable Test Equipment

The following is required to perform fiber optic cable tests:

- [1] OTDR;
- [2] A test reel, of at least 900 feet;
- [3] A light source at the appropriate wavelength;
- [4] Optical Power Measurement Equipment; and
- [5] Test Jumpers as specified for MM Fiber Testing: CPR Test Jumper-1 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; CPR Test Jumper-2 shall be 1-5 meters long with connectors compatible with the light source and power meter. Test Jumper-2 shall contain a Class IV SM fiber for tests on 1300nm light sources and which is single-moded at 850nm for tests on 850nm light sources.
- [6] Test Jumpers as specified for SM Fiber Testing: 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.

B. Fiber Optic Cable Testing with OTDR

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.

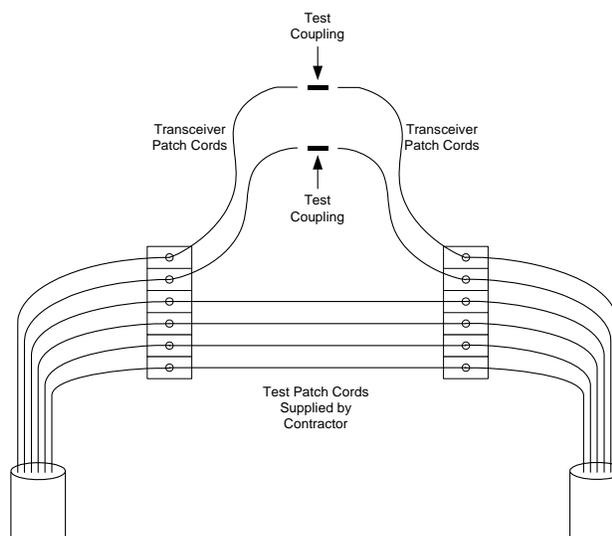
If the fiber is specified as "Install Only", the Contractor shall test the fiber on the reel and provide the test results to the Engineer prior to accepting the cable.

REVISION OF SECTION 614 TEST FIBER OPTIC 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 850nm and 1300nm for MM fibers and 1310nm and 1550nm for SM fibers. 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 not 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.

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:

- [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.

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TEST FIBER OPTIC CABLE**

- [5] Fiber identification including tube color and fiber color.
- [6] End point locations.
- [7] Launch conditions.
- [8] Method of calculation for the attenuation or attenuation coefficient.
- [9] Acceptable link attenuation.
- [10] Identify loss event.
- [11] Test direction.

C. *Fiber Optic Cable Testing with Optical Power Meter*

The Contractor shall conduct an Optical Power Meter Test for each fiber installed.

MM segments shall be tested in one direction at both the 850nm and the 1300nm wavelength. SM segments shall be tested in one direction at both the 1310nm and 1550nm wavelength.

In compliance with TIA/EIA-526-14A “Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant” and TIA/EIA-526-7 “Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant,” the following information shall be recorded in English units 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, spectral width, and for MM, the coupled power ratio (CPR).
- [5] Fiber identification including tube color and fiber color.
- [6] Identify loss event.
- [7] End point locations.
- [8] Test direction.
- [9] Reference power measurement (when not using power meter with a Relative Power Measurement Mode).
- [10] Method of calculation for the attenuation or attenuation coefficient.
- [11] Measured attenuation of the link segment.
- [12] Acceptable link attenuation.

The minor attenuation differences due to test direction are on par with accuracy and repeatability of the test method. Lateral segments in a building are limited to 90m. Therefore, attenuation differences caused by wavelength are insignificant and as a result, single wavelength testing is sufficient.

D. *Acceptable Attenuation Values*

Acceptable attenuation values shall be calculated for each fiber tested. These values represent the maximum acceptable test values.

A connection is defined as the joint made by mating two fibers terminated with re-mateable connectors (e.g. ST, SC, LC).

[1] *MM FIBER* – The general attenuation equation for any MM link segment is as follows:

$$\text{Acceptable Link Attenuation} = \text{Cable Attenuation} + \text{Connection Attenuation} + \text{Splice Attenuation} + \text{Coupled Power Ratio (CPR) Adj.}$$

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TEST FIBER OPTIC CABLE**

62.5nm MM Attenuation Coefficients:

- i] Cable Attenuation = Cable Length (km) x (3.40 dB/km@850nm or 1.00 dB/km@1300nm)
- ii] Connection Attenuation (ST or SC connectors) = (# of Connections x 0.39 dB) + 0.42 dB
- iii] Connection Attenuation (LC connectors) = (# of Connections x 0.14 dB) + 0.24 dB
- iv] Splice Attenuation (Mechanical or Fusion) = Splices x 0.30 dB
- v] CPR Adjustment = See table below

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.

[2] *SM FIBER* – The general attenuation equation for any SM link segment is as follows:

$$\text{Acceptable Link Attenuation} = \text{Cable Attenuation} + \text{Connector Attenuation} + \text{Splice Attenuation}$$

8.3nm SM Attenuation Coefficients:

- i] Cable Attenuation = Cable Length (km) x (0.34 dB/km@1310nm or 0.25 dB/km@1550nm)
- ii] Connection Attenuation (ST or SC connectors) = (# of Connections x 0.39 dB). No more than 0.75dB per connector.
- iii] Splice Attenuation (Mechanical or Fusion) = Splices x 0.20 dB

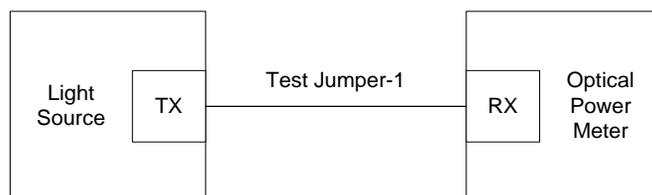
E. Test Procedures

All fiber testing shall be performed on all fibers in the completed end-to-end system.

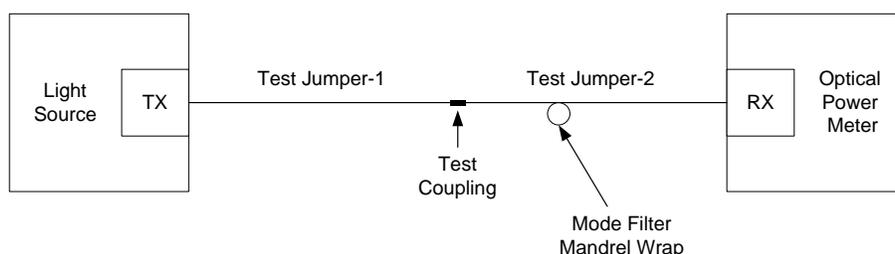
[1] *MM FIBER* – The MM fiber cable test shall be conducted as follows:

- i] Clean test jumper connectors and test coupling per manufacturer's instructions.
- ii] Follow the test equipment manufacturer's initial adjustment instructions.
- iii] 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.

REVISION OF SECTION 614 TEST FIBER OPTIC CABLE



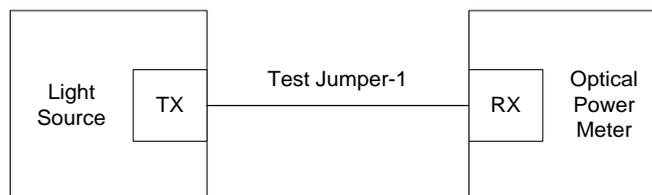
- iv] If meter has Relative Power Measurement (PM) Mode, use it. If not, reduce the Reference PM (P_{ref}). If meter can display power levels in dBm, select this unit to simplify calculations.
- v] Disconnect Test Jumper-1 from power meter. Do NOT disconnect test jumper from light source.
- vi] Connect 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.



- vii] Record PM (P_{sum}). If power meter is in Relative PM Mode, reading represents CPR value. If meter does not have Relative PM Mode, perform the following calculation:
 - a] If P_{sum} and P_{ref} are in the same logarithmic units: $CPR (dB) = P_{sum} - P_{ref}$
 - b] If P_{sum} and P_{ref} are in watts: $CPR (dB) = 10 \times \log_{10} [O_{sum}/P_{ref}]$

[2] *SM FIBER* – The SM Optical Power Meter fiber test shall be conducted as follows:

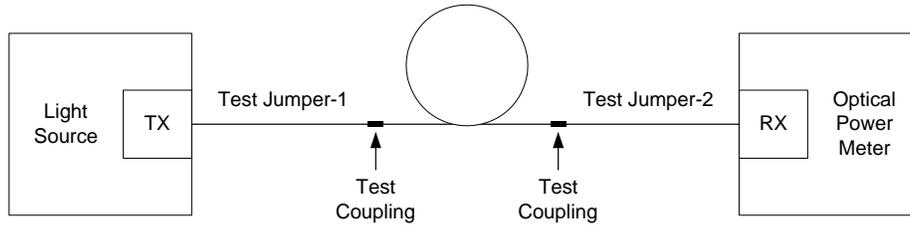
- i] Clean the test jumper connectors and test coupling per manufacturer’s instructions.
- ii] Follow the test equipment manufacturer’s initial adjustment instructions.
- iii] Connect Test Jumper-1 between the light source and the power meter. Avoid placing bends in the jumper that are less than 100mm (4 inches) in diameter.



- iv] If the power meter has a Relative Power Measurement Mode, select it. If it does not, reduce the Reference Power Measurement (P_{ref}). If the meter can display power levels in dBm, select this unit to simplify subsequent calculations.

**REVISION OF SECTION 614
TEST FIBER OPTIC CABLE**

- v] Disconnect Test Jumper-1 from power meter. Do NOT disconnect test jumper from light source.
- vi] Attach Test Jumper-1 to one end of the cable plant to be measured and attach Test Jumper-2 to the other end.



- vi] Record the PM (P_{sum}). 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:
 - a] If P_{sum} and P_{ref} are in the same logarithmic units: $CPR (dB) = P_{sum} - P_{ref}$
 - b] If P_{sum} and P_{ref} are in watts: $CPR (dB) = 10 \times \log_{10} [O_{sum}/P_{ref}]$

F. **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.

G. **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:

**REVISION OF SECTION 614
TEST FIBER OPTIC CABLE**

1. Fiber splice location;
2. Fiber splice configuration; and
3. Termination layout.

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.

All labor and materials required to provide for bi-directional test and acceptance of fiber optic cable shall be considered included in the cost for Telemetry (Field) and shall not be measured and paid separately.

**End Revision of Section 614
Test Fiber Optic Cable**

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

Section 625 of the Standard Specifications is hereby deleted and replaced with the following:

DESCRIPTION

625.01 This work consists of the construction surveying, calculating, and staking necessary for construction of all elements of this project. Work shall be done under the supervision of a Professional Land Surveyor (PLS) who is licensed in Colorado. If required, locating, preserving, referencing, installing and restoring the following types of land monuments by a Colorado-licensed PLS shall be considered included:

- 1.1 Primary Control monuments from which Right of Way (ROW) or any land boundary will be calculated, described or monumented;
- 1.2 Public Land Survey System (PLSS) monuments;
- 1.3 General Land Office (GLO) monuments;
- 1.4 Bureau of Land Management (BLM) monuments;
- 1.5 Mineral Survey (MS) monuments;
- 1.6 ROW monuments;
- 1.7 Property boundary monuments; and
- 1.8 Offsets, range points, benchmarks, easement monuments, and other monuments that are required by law or regulation to be established by a PLS.

Determination of any land boundary shall also be accomplished by a Colorado-licensed PLS.

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, tripods, tribachs, and Global Positioning System (GPS) receivers and equipment.

If any survey equipment is found functioning outside the manufacturer's specified tolerance, certification from an approved repair facility showing 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 & 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.

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

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 re-staking will be the responsibility of the Contractor at no cost to the project.

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 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 the construction shall be replaced, transferred or reestablished at 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 ROW and boundary surveying and licensed in 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 Measurement – 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 may be 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 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 on a lump sum basis.

BASIS OF PAYMENT

625.13 Payment for construction surveying will be the correct lump sum bid and will be full compensation for all surveying work necessary to complete the project to include resetting of stakes, marks, monuments and preparing survey documentation as required.

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

Partial payment for construction surveying, as determined by the Engineer, will be made as the work progresses.

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Construction Surveying	Lump Sum

Traffic control for Construction Surveying will be measured and paid for in accordance with Section 630.

**End Revision of Section 625
Construction Surveying**

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**REVISION OF SECTION 626
MOBILIZATION**

Section 626 of the Standard Specifications is hereby revised for this project as follows:

Subsection 626.01 shall be revised to include the following:

The list of work locations for this project is included within the contract documents. At this time, no priority order has been established for the order of completion of the referenced intersections. There is no guarantee that the Department will or will not request completion of the intersections in any priority order.

The Contractor shall therefore consider all mobilization requirements as appropriate when developing its bid and when scheduling the work. Following award, additional mobilization costs will not be paid if the Department does or does not prioritize the work locations.

**End Revision of Section 626
Mobilization**

**REVISION OF SECTION 627
PERFORMED PLASTIC PAVEMENT MARKINGS**

Section 627 of the Standard Specifications is hereby revised for this project as follows:

Section 627.08 shall include the following:

Installation shall be in accordance with the manufacturer's recommendations.

Subsection 627.12 shall include the following:

Removal of existing pavement marking will not be measured and paid for separately, but will be considered included in the unit cost for new pavement markings.

Sandblasting or other preparation of the roadway surface required to install preformed plastic pavement markings in accordance with the manufacturer's recommendation shall be considered incidental to the installation of new markings and will not be measured and paid separately.

**End Revision of Section 627
Performed Plastic Pavement Markings**

**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 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 is in place within the project limits. 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.

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.

**REVISION OF SECTION 629
SURVEY MONUMENTATION**

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

The accepted items and quantities will be paid by Force Account. Approval of the Engineer is required prior to undertaking any work identified as part of this Section.

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.

**End Revision of Section 629
Survey Monumentation**

**REVISION OF SECTION 630
UNIFORMED TRAFFIC CONTROL**

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.10 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. Authorization must be made by the Engineer in advance of working arrangements for uniformed officers. Arrangements for officers shall be made at least 2 weeks in advance by contacting the following police agency:

Denver Police Department (Special Events Unit)
Phone Number: 720-913-6034

Subsection 630.15 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. Note that 4 hours is the smallest increment of time to be used for individual intersections.

It is assumed that one 4-hour increment is required for each of the project locations.

Subsection 630.16 shall include the following:

The accepted number of hours of Uniformed Traffic Control will be paid at the contract unit price per hour.

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Uniformed Traffic Control	Hour

**End Revision of Section 630
Uniformed Traffic Control**

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.01 shall be deleted and replaced with the following:

This work consists of furnishing, installing, moving, maintaining and removing temporary traffic signs, advance warning arrow panels, portable message sign panels, flashing beacon (portable), barricades, channelizing devices, delineators, temporary traffic signals, mobile pavement marking zones, masking and unmasking signs in construction zones, and concrete barriers as required by, in descending order of precedence, 1] these plans and specifications; 2] the Traffic Barricade Manual published by the City and County of Denver (latest edition); 3] the Standard Specifications, as augmented by the Colorado Department of Transportation M and S Standards; and 4] the Manual on Uniform Traffic Control Devices (MUTCD) and the Colorado Supplement thereto in accordance with the contract. Devices shall comply with NCHRP 350 criteria and requirements. Devices temporarily not in use shall, as a minimum, be removed from the project and later returned to use if required. This work also includes Traffic Control Management, flagging and pilot car operation.

Subsection 630.02 shall include the following:

Roll-up construction signs will not be allowed.

Subsections 630.02 through 630.08 shall be as provided in the City & County of Denver Barricade Manual, latest edition. Modifications to said manual are as follows:

Section III shall include:

Traffic Control. Traffic control through the construction area is the responsibility of the Contractor. Before starting construction the Contractor shall submit, in writing, the proposed Method of Handling Traffic (MHT) for the initial phase of construction at each of the project locations. When a different MHT is required for subsequent construction phase, it shall be submitted to the Engineer two weeks prior to starting that phase. All proposed MHTs shall be approved in writing by the Engineer. No phase of construction shall start until an acceptable MHT has been received and approved by the Engineer.

The proposed methods shall include, as a minimum, the following:

- A detailed diagram that shows location of all sign placements, including advance construction signs (if not previously approved) and speed limit signs; method, length and time duration for lane closures; purpose and location of flaggers.
- A tabulation of all traffic control devices shown in the detailed diagram including but not limited to: construction signs, vertical panels; vertical panels with light; barricades; cones; drum channelizing devices; concrete barrier (temporary); advance warning flashing or sequencing arrow panel; portable message sign panel. Certain traffic control devices may be used for more than one operation, site or phase. However, all devices required for any particular phase must be detailed and tabulated for each phase. Certain traffic control devices may be used for more than one phase of construction.
- Number of flaggers and hours required.
- Number of days a Traffic Control Supervisor is required.
- Number of hours for Uniformed Traffic Control.

Approval of the proposed MHT is intended to indicate those devices for which payment is to be made. Such approval does not relieve the Contractor of liability specifically assigned to it under the contract.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

The Contractor shall erect and maintain warning lights, signs, barricades, and sufficient safeguards around all excavations, embankments and obstructions.

Section VI.B.3 shall include:

Non-metallic drums or tubular markers may be substituted for vertical panel channelizing devices.

Section VI.F shall include the following:

The Contractor shall, at the preconstruction conference, designate one of its employees, other than the superintendent, to be responsible for traffic control management. This responsibility shall include management of the Contractor's signing and all other details covered by the Specifications which contribute to the convenience, safety, and orderly movement of traffic and to the comfort of the traveling public. The designated employee will have the Certification of Worksite Traffic Control Supervisor by the American Traffic Safety Services Association (ATSSA) in lieu of completion of the CDOT minimum training requirements.

Traffic control devices shall be maintained and inspected on a 24-hour per day basis at no additional cost to the project. The Contractor shall make arrangements so that its Traffic Control Manager or approved representative will be available on every working day, on-call at all times and available upon the Engineer's request at other than normal working hours. The Traffic Control Manager shall have an up-to-date copy of Part VI of the MUTCD, pertaining to traffic controls for street and highway construction, as well as the City and County of Denver Traffic Barricade Manual, available at all times. In addition, provisions shall be made for flaggers to assist handicapped individuals, those who live or work near the project vicinity, and others to traverse through the construction zone safely, at no additional cost to the project.

Section VI.F.2; the third item shall read:

The flagger's STOP/SLOW paddle shall be 18 inches with letters six inches high.

Subsection 630.09 shall include the following:

Steel drum channelizing devices shall not be used for traffic control.

In Subsection 630.10 (a); delete the second paragraph and replace with 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 City Project Manager following approval of the Denver Traffic Engineering Services (TES) Department.

Approval of the proposed MHT does not relieve the Contractor of liability specifically assigned to it 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 City Project manager by Thursday at 3:00pm which streets or intersections it intends to work the following week. This notification will be made for all phases of construction.

MHT submittals shall include a tabulation of the anticipated number of hours required for uniformed traffic control.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

The Contractor shall submit an access plan with the final construction phasing plans. The access plan will show entry and exit locations and duration of closure for each impacted access point along the project.

Access to driveways and doorways shall be maintained at all times during construction. The Contractor shall coordinate driveway work and other work adjacent to buildings and doorways with the respective property owner

Failure of Contractor to submit detailed, comprehensive and clearly legible TCP and/or MHT will constitute grounds for rejection of TCP and/or MHT without extensive elaboration or comment from the City.

Subsection 630.10 shall include the following:

The key elements of the Contractor's Traffic Control Plan (TCP) and Method of Handling Traffic (MHT) are outlined in Subsection 630.10.

Components of the TCP for this project are included in the following documents. Traffic control for the project shall be provided in the same order of precedence listed:

1. The Plans, Project Special Provisions and Sections 104.04 and 630 of the Standard Specifications;
2. Denver Barricade Manual, current edition;
3. CDOT Standard Specifications, 2011 edition; augmented by CDOT M & S Standards, 2006 edition;
4. Manual on Uniform Traffic Control Devices (MUTCD) (2009 Edition).

Contractor shall submit, in writing, the proposed Method of Handling Traffic (MHT) for review and approval of the Engineer. MHT plans shall be developed in accordance with this section and the construction plans. Discrete and separate MHT and/or TCP submittals are required for each of the proposed phases of work. 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 MHT shall be approved, in writing, by the Engineer following approval of the Denver Traffic Engineering Services (TES) Department.

Subsection 630.13 shall include the following:

Specific Traffic Control Plan (TCP) requirements for this project are as follows:

1. During construction of this project, traffic shall use the present traveled roadway at all times unless otherwise directed or authorized by the Engineer. Contractor shall provide normal movements for vehicular and pedestrian traffic at all times, unless otherwise authorized or directed by the Engineer.
2. Work that interferes with traffic on the US-285 EB and WB ramps, Sheridan Boulevard and Alameda Avenue will only be permitted during the following hours:
 - A. The Contractor shall perform all work on the roadway between the hours of 8:30am and 3:30pm or as approved by the City Project Manager. Weekend and nighttime work will be allowed with the prior written approval of the City Project Manager. During all construction periods, a maximum of one lane only is allowed to be closed on each approach.
 - B. Work will not be permitted that directly or indirectly interferes with the flow of traffic between the hours of 5:50am to 8:30am Monday through Friday; between the hours of 3:30pm to 6:30pm Monday through Thursday; and after 2:00pm on Fridays unless otherwise authorized by the City Project manager.
 - C. No work will be allowed on holidays.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

- D. Contractor shall not close lanes during special events as determined by Denver TES. Contractor shall coordinate all on- and off-roadway work with Denver TES during any special event
 - E. Contractor shall coordinate lane closures with adjacent projects.
 - F. Contractor shall maintain business access during normal business hours.
3. Contractor shall install construction traffic control devices in locations where they do not block or impede other existing traffic control devices; or sidewalks for pedestrians, disabled persons or bicyclists. Contractor is restricted from storing and materials, construction traffic control devices, signs, and so on in any median area or Denver Park areas.
 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 of equipment 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. Contractor and subcontractors shall equip their construction vehicles with flashing amber lights. Flashing amber lights on vehicles and equipment shall be visible from all directions.
 7. Contractor shall maintain access to all roadways, side streets, walkways, alleyways, driveways, and hike/bike paths at all times unless otherwise approved by the Engineer. Parking areas temporarily disturbed by construction activities shall be restored to a usable 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 work which affects access to a property, the Access Maintenance Plan for that property must be submitted to, and approved by, the Engineer.
 8. The Access Maintenance Plan (AMP) shall be coordinated with all affected owners and tenants. The AMP 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 exceeding 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. 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, as approved by the Engineer. Delineation of pedestrian access through the work zone shall be accomplished using temporary plastic fencing.
 10. The costs of maintaining access will not be measured and paid for separately, but shall be considered 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 Contractor's expense prior to acceptance.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

11. During non-construction periods (weekends, holidays, etc.) all work shall be adequately protected to ensure the safety of vehicular, pedestrian and bicycle traffic, as detailed in the Contractor's MHT. Excavations, drop-offs or holes shall be backfilled, fenced or barrier-separated when unattended.
12. Whenever the Contractor removes, obliterates or overlays any pavement markings, it shall replace them on a daily basis prior to opening the affected areas to traffic. All temporary pavement markings shall fully comply with the Denver Barricade Manual and the MUTCD.
13. Contractor shall not have construction equipment or materials in the lanes open to traffic at any time unless otherwise approved or 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. Personal vehicles and construction equipment parking is prohibited in all private parking lots without payment or the respective property owner's permission. Landscaped areas, public park areas, and roadway shoulders shall be kept clear of parking and storage of all personal vehicles and construction equipment except where approved by the Engineer.
15. Contractor shall not place tack coat on any surface to be paved where traffic will be forced to travel upon fresh bituminous materials.
16. 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 may be required as directed by the Engineer and as required by RTD. For bus stop/route conflicts, contact RTD two business days prior to the start of construction. Contact Lorraine Taylor at RTD (303) 299-6940 regarding impacts to bus stop access (pedestrian or vehicular) 48 hours in advance of such impact.
17. The Contractor shall be required to maintain temporary drives at any existing establishment that has singular access off the roadway, unless otherwise approved in writing by the property owner.
18. Work that interferes with traffic on any day of a holiday; or 3-day or 4-day holiday weekend shall generally not be permitted. Holidays shall be as defined in Subsection 101.33 of the Standard Specifications.
19. All proposed lane closures are subject to the approval of the Engineer and TES Department. Requests for such lane closures shall be submitted with appropriate MHT 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 utilized in continuum for the duration of each working period. Contractor shall make all reasonable efforts to fashion its lane closure proposal to close a minimum number of lanes at any given time.
20. During no-work hours, roadways shall be restored to a safe travel condition for the free flow of traffic. All work to restore the roadways to this condition, including pavement patching and grading, shall be completed prior to opening the areas to traffic or completing work for the day.
21. Contractor shall clean the roadway of all construction debris before opening the facility to traffic.
22. All flagging stations used at night shall be illuminated using floodlights. Street, highway lights and high-mast lighting may be used for flag station illumination when approved by the Engineer. Floodlights shall be located and directed so as not to interfere with the vision of any motorists, with all such associated costs to be considered included in the work.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

23. Prior to removal and resetting of signs, the Contractor shall prepare an inventory for the Engineer's review. Any signs damaged due to operations of the Contractor 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 unit prices for the project, including any additional traffic control items required for haul routes into the projects.

General Traffic Control Plan (TCP) requirements for this project are as follows:

1. Documentation, Certifications and Training
 - A. All flaggers used on this project shall be certified.
 - B. The Contractor shall submit required MHT, and all appropriate Traffic Control Supervisor and Flagger documentation to the Engineer for approval prior to setting any traffic control device.
 - C. The contractor's superintendent and all others serving in similar supervisory capacity shall have completed two day Traffic Control Supervisor training as offered by the CCA. The one-day ATSSA Traffic Control Technician (TCT) training along with the two-day ATSSA Traffic Control Supervisor training will serve as an alternate. If the alternate is chosen, the Contractor shall provide written evidence that 80% score was achieved in both of the two training classes. The certifications of completion or certifications of achievement for all appropriate staff shall be submitted to the Engineer at the preconstruction conference.
2. Permitting and Coordination
 - A. Contractor shall obtain all required access and construction permits from the City prior to initiating work along City rights of way. Contractor's project superintendent shall have copies of applicable permits in-hand at all times while on site.
 - B. Contractor shall maintain frequent communication with the Engineer regarding all aspects of the daily and weekly work schedule.
 - C. Contractor shall coordinate and cooperate fully with the City & County of Denver, utility owners and other contractors; to assure adequate and proper traffic control is provided at all times. The Contractor shall coordinate and cooperate fully with any others providing traffic control for other operations in the vicinity of the work to ensure that work or traffic control devices do not interfere with the free flow of traffic except as allowed by the approved MHT.
3. Location, Positioning and Maintenance of Equipment and Devices
 - A. Contractor shall not have construction equipment or materials in the lanes open to traffic any time, unless approved by the Engineer.
 - B. Construction signing shall be removed unless work is in progress or construction equipment has been left on the job site.
 - C. All portable signs shall be removed from the roadway at the end of each work shift.
 - D. When storing portable signs or supports within the project they shall be removed beyond the clear zone and shall not be visible to traffic. All storage areas shall be approved. The minimum clear zone distance shall be 18 feet, measured from the edge of the traveled way. If the signs cannot be stored at least 18 feet from the traveled way, they shall be removed. Signs shall not be stored on paved surfaces.
 - E. All advanced construction signing shall be installed prior to any construction activity and remain in place for all work periods.
 - F. Resetting construction signs during construction as required by the work is considered incidental to the project and will not be paid separately.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

- G. Masking of existing or temporary signs as may be required by the work is considered incidental to the project and will not be paid for separately.
 - H. All personal / employee vehicle and construction equipment parking is prohibited when it conflicts with safety, access, or the flow of traffic.
 - I. Traffic control devices used on this project shall be kept clean and in good working order at all times. The Engineer shall make the ultimate determination regarding the explicit definition of “good working order.”
 - J. Existing signs, traffic signals, or other City-owned traffic control devices damaged due to Contractor’s operations shall be replaced in-kind or repaired by the Contractor at no additional cost to the project.
 - K. Road Work Ahead advance signs shall be reset as required to match the location of the work zone.
 - L. Night flagging may be allowed on this project subject to the master construction schedule however proper illumination of all flagging stations must be provided in accordance with the MUTCD if night work is approved.
 - M. All construction traffic control devices including signs installed under this project shall be installed as depicted in the MUTCD and CDOT M & S Standards.
 - N. At locations where such traffic is normally allowed, Contractor shall maintain continuous access through the project for pedestrians, bicyclists and disabled persons. When the existing access route is disrupted by construction or construction-related activities, a temporary access shall be provided. All pedestrian access shall be delineated through the work zone using proper channelizing devices.
 - O. Costs of removing, resetting or reinstalling construction traffic control devices shall be considered included in the work and will not be measured and paid for separately.
4. Vests: All on-site contractor personnel including superintendents are required to wear appropriate colored, reflective safety vests.
5. Access
- A. Access to individual properties shall be maintained at all times unless otherwise approved by the Engineer. The sole exception to this requirement is that the City may permit full closures of access to alleyways, walkways, driveways, and hike/bike paths *directly adjacent* to an active work zone for a maximum of one (1) week. Should the Contractor wish to exercise this exception, a request for same shall be submitted to the Engineer for review and approval including proposed method for Public Notice per Denver Section 632. If access restrictions are approved by the Engineer, the Contractor shall coordinate with all owners and/or tenants affected by alley and/or access closures two weeks prior to closure.
 - B. Access to driveways shall be maintained at all times during construction. The Contractor shall coordinate driveway work with the property owner. Appropriate signage shall be provided alerting all motorists leaving driveways that enter a work zone as to which direction the through lane is traveling and what access restrictions exist, if any. During construction, driveways shall be open with safe access to each property on the project generally as follows:
 - C. *Properties with a single driveway* – Either 12 feet or ½ of the existing driveway width shall be left open at all times.
 - D. *Properties with two or more driveways* – One driveway must be left open at all times.
6. Restricted and Allowable Work - General
- A. Saturday and Sunday work shall be allowed, subject to the City’s noise ordinance and as directed or authorized by the Engineer. Lane reductions will be allowed on weekends subject to the requirements listed in the Contractor’s approved MHT.
 - B. The contractor may be allowed to work weekdays prior to 8:30am and after 3:00pm Monday through Friday if: 1] work is accomplished during daylight hours; 2] the work takes place off the roadway and does not interfere with the flow of traffic; and 3] the given activity has been approved by the Engineer.

**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

- C. The contractor is allowed to work on multiple work areas, blocks or intersections simultaneously if that work schedule is so approved by the Engineer.
- D. Wherever other laws, ordinances, regulations or orders are more restrictive, they shall take precedence over these requirements.

7. Phasing Requirements

- A. The Contractor shall be allowed to work on two of the six intersection locations simultaneously. If so approved by the Engineer, additional locations may be allowed.
- B. At any given location, once excavation for sidewalk, curb ramp or pavement replacement activities are underway, all such work shall continue on a daily basis weather permitting until the replacement has been completed to the satisfaction of the Engineer.
- C. At any given location, once excavation for traffic signal foundations, pull boxes or conduits are underway, all such work shall continue on a daily basis weather permitting until the underground work has been completed to the satisfaction of the Engineer.

8. Payment Requirements

- A. All costs related to and incidental to the foregoing requirements shall be included in the original contract prices and will not be measured and paid for separately.
- B. Placement and removal of temporary pavement markings for traffic control during applicable construction phases will not be measured and paid for separately, but shall be included in the work.
- C. Payment for Uniformed Traffic Control will be made based on the number of hours, approved in advance by the Engineer, that Uniformed Traffic Control is utilized to control and direct traffic through the construction zone.

Subsection 630.15 shall include the following:

When the contract includes Traffic Control pay items by the week:

Traffic channelizing devices consisting of vertical panel, traffic cones, or drum channelizing devices will be measured by the unit/week. Concrete barriers will be measured by the linear foot/week. Advance warning flashing or sequencing arrow panels will be measured by the unit/week according to size. Flashing beacon (portable) will be measured as a unit/week complete in place. Sign panels will be paid under the appropriate item unit/week.

A day shall be defined as the time from 12:00 midnight to 11:59pm. A week shall be defined as the time from Sunday/Monday at 12:00 midnight to the following Sunday at 11:59pm. The Traffic Control Manager shall keep a daily log of traffic control devices and personnel. The log shall list all devices and personnel deployed within the limits of construction for each day and shall be available for review by the Engineer by noon the following Monday to be eligible for payment for the previous week's work.

Construction traffic control devices, as determined by the approved MHT, will be paid for based on the Traffic Control Manager's weekly submittal of daily logs. The number of traffic control devices paid per week shall be the maximum number of approved devices deployed on any one day during that week.

**End Revision of Section 630
Construction Zone Traffic Control**

FORCE ACCOUNT ITEMS

This special provision contains the Department's estimate for force account items included in the Contract.

Such estimated amounts will be added to the total bid to determine the project commitment amount and the amount of payment and performance bonds.

Force Account work shall be performed as directed by the Engineer.

A. **Force Account Descriptions**

F/A 01 Minor Contract Revisions – This Force Account addresses the cost of minor work authorized and approved by the Engineer, which is not included in the contract drawings or Project Special Provisions, and is necessary to accomplish the scope of work of this contract.

F/A 02 On-the-Job Trainee – This Force Account addresses the cost of maintaining on-the-job pilot training program(s) in accordance with the provisions of the On-the-Job Training Standard Special Provision.

F/A 03 Furnish and Install Electrical Service – This Force Account addresses the cost for furnishing and installing new power sources for each of the rebuilt project traffic signals by the local utility company in coordination with the Contractor, Engineer and the City & County of Denver.

F/A 04 Landscaping – This Force Account addresses the cost of restoration of landscaping features including irrigation systems and vegetation that have been disturbed by construction activities.

F/A 05 Erosion Control – This Force Account addresses the cost of providing minor erosion control measures throughout the duration of the project such as topsoil, seeding (native), mulching (weed free), mulch tackifier and other erosion control items requested by the erosion control supervisor. All such items shall be pre-approved by the Engineer prior to installation or they will be at no additional cost to the project.

F/A 06 Environmental Health and Safety Management – This Force Account addresses the cost of monitoring and disposal of contaminated soil, should any be encountered during construction. If any contamination is encountered, work in the area shall stop immediately, and the procedures in the Project Special Provision for Section 250 – Environmental Health and Safety Management, shall be followed. Environmental Health and Safety Management shall include any unforeseen HSO hours, testing of any contaminated soil, and disposal of such soils. All payment for such work shall be accommodated through this Force Account.

F/A 07 Survey Monumentation – This Force Account addresses the cost of new survey monuments, monument boxes and adjustment of monuments as required and upon direction from the Engineer.

B. BASIS OF PAYMENT

Payment will be made in accordance with the Contract. 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.

FORCE ACCOUNT ITEMS

<u>Force Account Item</u>	<u>Estimated Quantity</u>	<u>Amount</u>
F/A 01 Minor Contract Revisions	F/A	\$30,000.00*
F/A 02 On-the-Job Trainee	F/A	\$640.00*
F/A 03 Furnish and Install Electrical Service	F/A	\$15,000.00
F/A 04 Landscaping	F/A	\$10,000.00*
F/A 05 Erosion Control	F/A	\$5,000.00*
F/A 06 Environmental Health and Safety Management	F/A	\$5,000.00*
F/A 07 Survey Monumentation	F/A	\$1,000.00*

** indicates planned force account(s) to be included in the Contractor's bond amounts for the project.*

**End Section
Force Account Items**

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UTILITIES

Known private utilities for the **Alameda intersections at Clay, Lipan and Platte River Drive** are:

Utility Owner	Contact/E-Mail	Phone/Cell/Fax
XCEL Energy – Electric	Marisa Montoya Local Gov. Project Manager marisa.l.montoya@xcelenergy.com	T: 303-571-3720 C: 303-718-9286 F: 303-571-3102
XCEL Energy – Electric	Michael Wolfe Assigned Design Manager	T: 303-571-3106
XCEL Energy – Gas	Michele McKnight Gas Operations Engineer michelle.t.mcknight@xcelenergy.com	T: 303-571-3358 C: 303-434-7147 F: 303-571-3166
Comcast Cable	Leo Coats Construction Coordinator leo_coats@cable.comcast.com	T: 303-603-5065 C: 720-413-0158
Century Link (Qwest) <i>Alameda Intersections</i>	Andy Devine Senior Design Engineer andy.devine@qwest.com	T: 303-792-6298 C: 720-331-6091

Known private utilities for the **Sheridan intersections at the US-285 ramp intersections** are:

Utility Owner	Contact/E-Mail	Phone/Cell/Fax
XCEL Energy – Electric	Marisa Montoya Local Gov. Project Manager marisa.l.montoya@xcelenergy.com	T: 303-571-3720 C: 303-718-9286 F: 303-571-3102
XCEL Energy – Electric	Sharon Clay Assigned Design Manager	T: 303-571-3159
XCEL Energy – Gas	Michele McKnight Gas Operations Engineer michelle.t.mcknight@xcelenergy.com	T: 303-571-3358 C: 303-434-7147 F: 303-571-3166
Comcast Cable	Leo Coats Construction Coordinator leo_coats@cable.comcast.com	T: 303-603-5065 C: 720-413-0158
Century Link (Qwest) <i>Sheridan/US-285 North and South</i>	Bill Howeth Senior Design Engineer bill.howeth@qwest.com	T: 303-451-4644 C: 720-988-0891 F: 303-451-3205

Known private utilities for the **Sheridan intersection at Byron Place/25th Avenue** are:

Utility Owner	Contact/E-Mail	Phone/Cell/Fax
XCEL Energy – Electric	Marisa Montoya Local Gov. Project Manager marisa.l.montoya@xcelenergy.com	T: 303-571-3720 C: 303-718-9286 F: 303-571-3102
XCEL Energy – Electric	Sharon Clay Assigned Design Manager	T: 303-571-3159
XCEL Energy – Gas	Michele McKnight Gas Operations Engineer michelle.t.mcknight@xcelenergy.com	T: 303-571-3358 C: 303-434-7147 F: 303-571-3166
Comcast Cable	Leo Coats Construction Coordinator leo_coats@cable.comcast.com	T: 303-603-5065 C: 720-413-0158
Century Link (Qwest) <i>Sheridan/25th/Byron</i>	Jodie Farnsworth Senior Design Engineer jodie.farnsworth@qwest.com	T: 303-451-2379 C: 303-946-7495 F: 303-451-3205

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UTILITIES

Known City & County of Denver facilities or other public utilities for **all six project locations** are:

Utility Owner	Contact/E-Mail	Phone/Cell/Fax
Denver Water	Vince Gaiter vince.gaiter@denverwater.org	T: 303-628-6527
Denver Wastewater	Zhixu Yuan zhixu.yuan@denvergov.org	T: 720-865-3140 F: 720-865-3280
Denver Traffic <i>Traffic Signal Design Coordination</i>	Paul Bountry paul.bountry@denvergov.org	T: 720-913-4840 C: 303-513-6052 F: 720-865-3232
Denver Traffic Operations <i>Traffic Signals and Fiber Optics</i>	Chris Lillie chris.lillie@denvergov.org	T: 720-865-4066 C: 303-880-0386 F: 720-865-4170

The work described in these plans and specifications requires full cooperation between the Contractor and the utility owners in accordance with Subsection 105.11 of the CDOT Standard Specifications for Road and Bridge Construction (2011 Edition) and the City & County of Denver General Contract Conditions, in conducting their respective operations, to complete the utility work with minimum delay to the project.

PART 1 – CONTRACTOR SHALL PERFORM THE WORK LISTED BELOW:

Coordinate project construction with performance of utility owners of each utility work element listed in Part 2 below. Perform preparatory work specified in Part 2 for each utility work element. 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, as specified in Part 2, immediately prior to the time the utility work must begin to meet the project schedule.

Prior to excavating, the Contractor shall positively locate all potential conflicts with existing underground utilities and proposed construction, as determined by the Contractor according to the proposed methods and schedule of construction.

The Contractor shall modify construction plans to avoid existing underground facilities as needed, and as approved by the Engineer. Please note that UNCC marks only member facilities – other facilities, such as ditches and drainage facilities may exist, and it is the Contractor’s responsibility to investigate, locate and avoid such facilities.

The Contractor shall provide written notices to each utility owner, with a copy to the Engineer, immediately prior to each utility work element on the construction schedule that is expected to be coordinated with construction.

The Contractor shall allow the number of work days required for each utility work element in the construction schedule. The number of days expected for construction and number of days of prior notice is specified for each utility owner.

Perform each utility work element for every utility owner listed in Part 1. Notify each utility owner in advance of any work being done by the Contractor to its facility, so that the utility owner can coordinate its inspections for final acceptance of the work with the Engineer.

Obtain written acceptance from the utility owner for work performed by the Contractor.

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UTILITIES

For XCEL Energy, the following procedures apply:

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 Xcel Energy, and the related Operating Agreement and Street Lighting Agreement (collectively known as "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 relocation commence.*"

In reference to new/modified service to City facilities (i.e. power supply, removal or installation of poles, and so on) 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 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.

Conduct necessary utility coordination meetings, and provide other necessary accommodations as directed by the Engineer. Complete any other tasks specified in Part 2 or elsewhere in this utility specification.

XCEL Energy Work Elements:

General Coordination

Contractor shall coordinate the following elements of work with XCEL throughout the construction period: 1] removal of existing power poles, overhead electric lines, and light poles by XCEL Energy forces where required; 2] removal of existing traffic signal-light poles and luminaires; 3] provision of new power sources by XCEL Energy forces; 4] final connection of new traffic signal wiring to new power source by XCEL Energy forces including installation of electric meter pedestal and meter by Contractor; 5] disconnection of old signal wiring at previous power source; 6] adjustment of existing electrical pull boxes if required..

Materials List

Contractor shall submit the materials list, with locations for the proposed signal poles, light standards and luminaires for review and approval by XCEL Energy. This review is expected to take 30 calendar days to complete.

For Denver Wastewater Management Division (WMD) facilities, the following applies:

It is the responsibility of the Contractor to examine the site for evidence of failures or of deficiencies in Denver Wastewater management Division (WMD) facilities and to immediately call any such evidence of pre-existing damage to the attention of the WMD along with proper documentation.

Without such evidence of pre-existing damage, the Contractor agrees that any and all damages (direct or indirect) to WMD facilities, which may be subsequently discovered within those areas where construction occurred within six feet of WMD facilities (direct or indirect) and within a period of three years from the date of construction, were caused by construction activities. Furthermore, their repair is agreed to be the sole responsibility of the Contractor.

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UTILITIES

It shall be the Contractor's responsibility to protect all WMD facilities within the area of construction. This includes all steps necessary to prevent subsidence of the soil adjacent to or near WMD facilities.

Denver Wastewater Management Division Work Elements:

General

Coordinate all required scheduling and inspections with Denver Wastewater Management forces.

Notify the utility owner 5 days immediately prior to required inspections of utility work performed by the Contractor.

Sheridan Boulevard & Southbound US-285 Ramps (North Intersection)

Remove existing storm sewer inlet and install new inlet on south side of northeasterly island at Sheridan Boulevard and north ramp intersection. Construct pipe extension as required and make all required connections to existing pipes as shown in the plans.

Adjust northeast island storm manhole to match proposed finish grade as shown in the plans.

Sheridan Boulevard & Northbound US-285 Ramps (South Intersection)

Remove existing storm sewer inlet and install new inlet on south side of northwesterly island at Sheridan Boulevard and south ramp intersection. Construct pipe extension as required and make all required connections to existing pipes as shown in the plans.

Construct inlet and culvert to carry surface flows under southeast-most pedestrian ramp at Sheridan Boulevard and south ramp intersection. Construct as required and as shown in the plans.

Alameda Avenue & Clay Street

Remove existing storm sewer inlet and install new inlet on southwest corner Alameda & Clay. Construct pipe extension as required and make all required connections to existing pipes as shown in the plans.

Adjust sanitary sewer manhole in vicinity of proposed new north gutter pan to match proposed finish grade as shown in the plans.

Denver Traffic Engineering Services (TES) and Traffic Operations Division Work Elements:

General

Coordinate all required scheduling and inspections with Denver TES and/or Traffic Operations Divisions.

Notify the utility owner 5 days immediately prior to required inspections of utility work performed by the Contractor.

Project-Wide

Adjust and/or replace communications pull boxes throughout the project to match proposed finish grades as shown in the plans.

Alameda Avenue & Platte River Drive

Adjust communications manhole on northwest corner to match finish grade as shown in the plans.

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.

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UTILITIES

The utility owner shall prepare and submit to the Engineer a Method of Handling Traffic (MHT) for utility work to be performed outside typical project work hours. The utility owner shall obtain acceptance of the MHT from the Engineer prior to beginning the utility work to be performed outside typical project work hours.

Denver Wastewater Management Division Work Elements:

Inspect utility work performed by the Contractor listed in Part 1 above.

Denver Traffic Engineering Services (TES) and Traffic Operations Divisions:

Inspect traffic signal and signal system communications work performed by the Contractor listed in Part 1 above.

XCEL Energy – Street Lighting and Electric Distribution Work Elements:

1. *All Project Intersections*

- a. Identify and provide new metered traffic signal power sources for each of the six proposed new controller locations. Provide notification to the Engineer regarding location of each new power source. This work shall be coordinated by the Contractor with XCEL Energy during construction and is expected to take 1 working day at each intersection to complete.
- b. After the Contractor has completed construction of the proposed traffic signals, connect each power source to the new power feed wiring for the respective signal. Note that all new cabinet installations shall be metered, although metering equipment will be furnished and installed by the Contractor in this project. This work shall be coordinated by the Contractor with XCEL Energy during construction and is expected to take 1 working day at each intersection to complete.
- c. After the Contractor has removed signal heads and ancillary equipment (including indications, signs, span wire, push buttons, etc.) on signal poles to be removed, XCEL Energy forces shall remove the traffic signal poles with attached luminaires as shown in the plans. Contractor shall partially or completely remove the pole foundations after XCEL Energy forces have completed removal of the existing signal poles and luminaires.
- d. After the contractor has completed construction of the proposed traffic signals and they are operational and accepted, XCEL Energy forces shall disconnect wiring for previous signal to be removed at the power source. This work must be coordinated by the Contractor with XCEL Energy during construction and is expected to take 1 working day at each intersection to complete.
- e. After the contractor has completed earthwork within 6" of final grade, XCEL Energy forces shall adjust any previously existing electric junction boxes to remain, to within 1/2" of final grade of surface as shown on the plans. This work must be coordinated by the Contractor with XCEL Energy during construction and is expected to take 1 working day at each intersection to complete.

2. *All West Alameda Avenue Intersections*

At the three Alameda intersections; raise, remove or relocate existing overhead power lines, existing power poles and existing light poles to accommodate construction as shown in the plans. The referenced conflicting overhead facilities are as follows:

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UTILITIES

- a. West Alameda Avenue & South Clay Street
 - i. Raise, remove or relocate existing overhead power lines running both east and west from existing northwest corner span-wire pole to be removed.
 - ii. Raise, remove or relocate existing overhead power lines running both east and west from existing southeast corner span-wire pole to be removed.

- b. West Alameda Avenue & South Lipan Street
 - i. Raise, remove or relocate existing power lines running in five (5) directions (north, east, southeast, southwest and west) from existing power pole on northwest corner.
 - ii. Remove existing power/utility pole on northwest corner.
 - iii. Raise, remove or relocate existing overhead power lines running both east and northwest (the latter is the same line referenced as southeast from the northwest corner pole) from existing southeast corner span-wire pole to be removed.
 - iv. Remove existing street light and pole approximately 80 feet east of Lipan, south side of Alameda.

- c. West Alameda Avenue & Platte River Drive
 - i. Raise, remove or relocate existing overhead power lines running both east and west from existing northeast corner span wire pole.
 - ii. Raise, remove or relocate existing overhead power line running west from existing northwest corner pole.
 - iii. Raise, remove or relocate existing overhead power lines running both east and west from existing southwest corner span wire pole.
 - iv. Remove existing street light and pole approximately 30 feet east of Platte River Drive, south side of Alameda.

Relocate or re-establish existing local electrical feeds, services and street lighting as required that will be disrupted by removal of these facilities. All such work shall be coordinated with affected property owners. This work must be coordinated by the Contractor with XCEL Energy during construction and is expected to take ten (10) working days at each intersection to complete.

3. *Sheridan Boulevard Intersections*

No existing overhead facilities are in conflict with the proposed construction at the three Sheridan intersections.

4. *General*

The Contractor shall provide the utility owner written notice 120 days immediately prior to the need for each utility work element. For street lighting and electric distribution elements, notification shall be provided to the following individual or designated representative:

Mr. Ron Johnson
Design Manager
XCEL Energy, Design / Layout Department
1123 W. 3rd Avenue
Denver, CO 80223-1351

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UTILITIES

All Other Utility Companies:

No relocation work is anticipated.

GENERAL

Utility lines shown on the plan sheets are plotted from the best available information. The Contractor's attention is directed to subsection 105.11 of the Standard Specifications concerning utilities.

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating or grading is planned in the area of underground utility facilities.

The Contractor shall notify all affected utilities at least two (2) business days, not including the actual day of notice, prior to commencing such operations.

The Contractor shall notify the Utility Notification Center of Colorado (UNCC) at **811** or **1-800-922-1987** to have locations of UNCC registered lines marked by member companies. All other underground facilities shall be located by contacting the respective owner. Utility service laterals shall also be located prior to beginning excavation or grading.

**End Section
Utilities**

DENVER PARKS DEPARTMENT SPECIFICATIONS

The following specifications have been written by the Denver Parks Departments and apply to this project only for work to be undertaken at the southeast corner of the Sheridan and 25th/Byron Place intersection. The referenced intersection is the northwest corner of the Denver Park containing Sloan's Lake.

Section 02810 – Irrigation Systems

PART I - GENERAL

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

1.2 SUMMARY:

A. Work of this Section consists of installation of an underground irrigation system including the following:

1. Trenching, stockpiling excavation materials, refilling and compacting trenches.
2. Complete irrigation system including but not limited to piping, valves, fittings, heads and wiring, and final adjustments to insure complete coverage.
3. Water connections.
4. Replacement of unsatisfactory materials.
5. Cleanup, inspections, and approval.
6. Tests.

B. Related Work:

1. Concrete Flatwork: Section 02520
2. Soil Preparation: Section 02920
3. Turfgrass Seeding: Section 02932
4. Native Seeding: Section 02933
5. Sodding: Section 02935
6. Trees and Shrubs: Section 02950

1.3 REFERENCES

A. Conform to requirements of reference information listed below except where more stringent requirements are shown or specified in Contract Documents.

1. American Society for Testing and Materials (ASTM) - Specifications and Test Methods specifically referenced in this Section.
2. Underwriters Laboratories (UL) - UL Wires and Cables.
3. National Sanitation Foundation (NSF) – Piping and backflow prevention.
4. American Water Works Association – Piping and backflow prevention.

1.4 QUALITY ASSURANCE

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

1. List of 3 projects completed in the last 2 years of similar complexity to this project. Description of projects shall include:

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

- a. Name of project.
- b. Location.
- c. Owner.
- d. Brief description of Work and project budget.

B. Special Requirements.

1. Work involving substantial plumbing for installation of copper piping, backflow preventer(s), and related Work shall be executed by licensed and bonded plumber(s). Secure a permit at least 48 hours prior to start of installation.
2. Tolerances - Specified depths of mains and laterals and pitch of pipes are minimums. Settlement of trenches is cause for removal of finish grade treatment, refilling, compaction, and repair of finish grade treatment.
3. Coordination With Other Contractors - Protect, maintain, and coordinate work with work under other Sections.
4. Damage To Other Improvements - Contractor shall replace or repair damage to grading, soil preparation, seeding, sodding, or planting done under other Sections during Work associated with installation of irrigation system at no additional cost to the City.
5. Water Delivery Interruption – When working on an existing irrigation system, the Irrigation Contractor shall contact the Parks Project Manager and inform him 72 hours in advance of any water interruption that is required..
6. Work involving high voltage electrical wiring, grounding and related Work shall be executed by licensed and bonded electrician(s). Secure a permit at least 48 hours prior to start of installation
7. Coordination with other contractors: Irrigation installer shall protect, maintain, and coordinate his work with other work under this contract.

C. Pre-Construction Conferences:

1. Contractor shall schedule and conduct a conference to review in detail quality control and construction requirements for equipment and materials used to perform the Work. Conference shall be scheduled not less than 10 days prior to commencement of Work. All parties required to be in attendance shall be notified no later than 7 days prior to date of conference. Contractor shall notify qualified representatives of each party concerned with that portion of Work to attend conference, including but not limited to the Parks Project Manager, Contractor's Superintendent, and Installer.
2. Prior to commencement of Work, Contractor shall schedule an on-site conference with Parks Project Manager, Parks Forestry and any other parties designated by Parks Project Manager to discuss tree protection requirements, marshalling locations, traffic control, and equipment access. Provide a minimum of 7 days notice prior to date of conference.
3. Minutes of each conference shall be recorded and distributed by Contractor to all parties in attendance within five (5) days of conference.

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

- A. **Material List:** Submit a complete list of materials, indicating manufacturer, model number and description of all materials and equipment to be used. Show appropriate dimensions and adequate detail to accurately portray intent of construction.
- B. **Shop Drawings:** If applicable, submit shop drawings indicating electrical wiring design and assembly of backflow preventer, including plumbing and foundation/support system if the installation differs from the manufacturer's recommended installation.

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- C. Samples:
1. Valve clusters: Provide a completely built electrical valve cluster. This mock-up, to include four electric valves, quick coupler, angle valve, and manifold and riser, may be incorporated into the work toward the end of the project.
 2. Swing joints: Provide a pre-manufactured or constructed swing joint assembly as per detail.
- D. Operation and Maintenance Data: Coordinate scheduling/precipitation instructions with the City's maintenance personnel. Submit three (3) bound brochures to Parks Project Manager including:
1. Winterization and spring start-up procedures.
 2. Cut sheets of products.
 3. Manufacturer's maintenance and checking instruction for irrigation controller.
 4. Manufacturer's maintenance and operation instruction for weather station and any other water conservation equipment.
 5. Manufacturer's maintenance and checking instruction for backflow preventer (if applicable).
 6. Manufacturer's maintenance and operation instruction for pump station (if applicable).
- E. Warranty: Submit one year written warranty, in accordance with Paragraph 1.8 below.
- F. Record Drawings (As-Built):
1. At onset of irrigation installation, Contractor will secure Xerox copies of original irrigation design from Parks Project Manager. At the end of every day, revise hard copy drawings in red ink to show any deviations from the design in the Work accomplished that day. As-Built Drawings shall be brought up-to-date at the close of the working day every Friday by a qualified draftsman. A print of record plan(s) shall be available at Project Site for review. Indicate mainline, zoning and wiring changes on weekly As-Built Drawings. Indicate non-pressure piping changes on as-builts.
 2. Preparation of Record Drawings (As-Built): Dimension from two permanent points of reference (building corners, sidewalk, road intersections or permanent structures) the location of the following items:
 - a. Point of connection.
 - b. Routing of sprinkler pressure lines. Provide dimensions for each 100 L.F. (maximum) along each routing and for each change of direction.
 - c. Sprinkler control valves.
 - d. Quick coupling valves.
 - e. Drain valves
 - f. Master valves
 - g. Flow sensors
 - h. Rain sensors/weather station
 - i. Wire splice boxes
 - j. Control wire routing if not with pressure mainline.
 - k. Gate valves.
 - l. Air relief valves.
 - m. Sleeves.
 - n. Flush valves.
 - o. Power service drop.
 - p. Other related equipment as directed.
 3. Make dimensions accurately at the same scale used in the original drawings, or larger. Notes and dimension lettering must be legible.

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Section 02810 – Irrigation Systems (Continued)

4. Irrigation legend must be changed to accurately reflect irrigation equipment installed, if such equipment is not same as originally specified on contract documents. This includes flow rates, effective spray diameter/radius and operating pressure of all sprinkler heads.
5. Parks Project Manager will not certify any pay request submitted by the Contractor if the As-Built Drawings are not current, and processing of pay request will not occur until As-Built Drawings are updated.
6. Final Submittal: Upon completion of Project, prior to final acceptance, secure digital copy of irrigation design from Parks Project Manager and record As-Built information that reflects all changes made over the course of the construction project, prepared by a qualified draftsman. As-Built Drawings shall include details including any revisions as per installation. Deliver and submit to Parks Project Manager for review two 3 mil. Mylar prints of As-Built, and digital As-Built drawing on disk in both PDF and CAD format (include any related X-ref files, plot files and pen settings.) Make any additional changes to the file as directed by the Parks Project Manager prior to final submittal and approval.
7. Request for final payment will not be certified or processed until all As-Built prints and digital files have been received and approved.

G. Controller Charts:

1. Do not prepare charts until record drawings have been reviewed and approved by the Parks Project Manager.
2. Provide one controller chart for each automatic controller installed.
 - a. Chart shall be reproduction of record drawing, one page 11" x 17". If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility.
 - b. Chart shall be print of actual "as-built" system, showing the entire area covered by that controller on one sheet.
 - c. Identify controller, all remote valves and lateral lines of each remote control valve, using a distinctly different color for each zone. Include the entire area of the controller's coverage. Provide a legend.
3. Provide one chart for the entire system.
 - a. Chart shall be reproduction of "as-built" record drawing, one page maximum 36" by 48", photo reduced to maximum size and legibility.
 - b. Identify all controllers, remote valves and lateral lines using different colors to distinguish zones adjacent to other zones.
4. Provide one controller programming schedule for each automatic controller.
 - a. Installed, one page maximum, 8-1/2" x 11". Identify Controller manufacturer and model. List in tabular form for each zone: Controller, zone number, gallons per minute flow rate (GPM), zone operating pressure, irrigation type (rotor/pop-up/subsurface), description of location and landscape type, program, each zone's run-time, number of run times weekly, total weekly GPM, and total weekly inches per acre. Provide for May, July and September based on historical ET: controller run times, weekly GPM, and inches per acre.
5. Following review of charts and schedules by Parks Project Manager, provide two additional color duplicates of controller charts and controller schedules. One set of controller charts and schedules shall be laminated between two layers of 3 mil. plastic sheet. Provide digital copies of charts and schedules in pdf format.
6. Charts and controller schedules shall be completed and reviewed prior to final review of irrigation system.
7. Request for final payment will not be certified or processed until all prints and files for controller charts and schedules have been received and approved.

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1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Deliver all components to job site in original unopened packaging containers prominently displaying manufacturer's name, volume, quantity, contents, instructions, and conformance to local, state, and federal law. Remove and replace cracked, broken, or contaminated items or elements prematurely exposed to moisture, inclement weather, snow, ice, temperature extremes, fire, or jobsite damage.
2. Handling, storage and delivery of PVC pipe:
 - a. Exercise care in handling, loading and storage of PVC pipe.
 - b. Provide 48 hours advance notice of delivery to Parks Project Manager for observation of unloading and handling of PVC materials during delivery.
 - c. All PVC pipe shall be transported in a vehicle which allows length of pipe to lie flat so as not to subject it to undue bending or concentrated external loads. All sections of pipe that have been dented or damaged shall be discarded, and if installed, shall be replaced with new piping.

B. Storage and Protection:

1. Deliver, unload, store, and handle materials, packaging and bundling products in dry, weatherproof condition in manner to prevent damage, breakage, deterioration, intrusion, ignition, and vandalism.

1.7 JOBSITE CONDITIONS:

A. Existing Conditions:

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

B. Protection of Property:

1. Preserve and protect all trees, plants, monuments, structures, and paved areas from damage due to Work of this Section. In the event damage does occur, all damage to inanimate items shall be completely repaired or replaced to satisfaction of the Parks Project Manager, and all injury to living plants shall be repaired or replaced by the City. All costs of such repairs shall be charged to and paid by Contractor.
2. Protect buildings, walks, walls, and other property from damage. Erect and maintain barricades, warning signs and lights, and provide guards as necessary or required to protect all persons on the site. Damage caused to asphalt, concrete, or other building material surfaces shall be repaired or replaced at no cost to the City. Restore disturbed areas to original condition.

C. Protection of Existing Trees:

1. All trenching or other work under limb spread of any and all evergreens or low branching deciduous material shall be done by hand or by other methods so as to prevent damage to limbs or branches.

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Section 02810 – Irrigation Systems (Continued)

2. Where it is necessary to excavate adjacent to existing trees, use all possible care to avoid injury to trees and tree roots. Excavation in areas where 2-inch and larger roots occur shall be done by hand. Roots 2 inches or larger in diameter, except directly in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a trenching machine is operated close to trees having roots smaller than 2 inches in diameter, wall of trench adjacent to tree shall be hand trimmed, making clean cuts through roots. Trenches adjacent to trees shall be closed within 24 hours, and when this is not possible, side of trench adjacent to tree shall be kept shaded with moistened burlap or canvas.

D. Protection and Repair of Underground Lines:

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

E. Replacement of Paving and Curbs:

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

1.8 WARRANTY/GUARANTY:

- A. Provide 1 year written warranty for material and installation from date of Substantial Completion.
- B. Expenses due to vandalism before Substantial Completion shall be borne by Contractor.
- C. Settling of backfilled trenches which may occur during guaranty period shall be repaired at no expense to the City, including complete restoration of damaged property.
- D. City will maintain turf and planting areas during warranty period, so as not to hamper proper operation of irrigation system, unless maintenance by Contractor is specified by contract. Contractor is responsible to monitor and coordinate controller scheduling and maintenance with Parks maintenance staff for any seeding, sodding or planting areas under Contractor's warranty.
- E. The City and County of Denver Department of Parks and Recreation reserves the right to make temporary repairs during the warranty period as necessary to keep systems in operating condition without voiding the Contractor's warranty, nor relieving Contractor of his responsibilities.
- F. Contractor shall make repairs and replacement promptly when notified, within three days of notification. If Contractor fails to make repairs within three days, City may make such repairs at Contractor's expense.

1.9 MAINTENANCE:

- A. Where applicable, furnish the following maintenance items to City prior to Final Acceptance:
 1. Two sprinkler heads for each size and type specified.
 2. Two nozzles for each type of head.
 3. Two wrenches for each type of head cover.

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Section 02810 – Irrigation Systems (Continued)

4. Two wrenches for removing and installing each type of head.
 5. Two valve keys for operating each type of manual valve.
 6. Two keys for valve markers.
 7. Two keys for valve box covers.
 8. Two valve keys and hose swivels for each type of quick coupling valve.
 9. Four controller cabinet keys.
 10. One remote control device for each controller.
- B. Maintenance During Project Construction:
1. Contractor shall fence, water and keep weed free any turf and planting areas within active phases of construction. Coordinate controller scheduling and maintenance operations with Parks maintenance staff and Parks Project Manager for portions of Park property unaffected by current phases of construction.
- C. Additional Maintenance During Warranty Period:
1. Make repairs and replacements needed due to defective workmanship and materials.
 2. Winterization – include cost in bid for winterizing complete system at conclusion of irrigation season (during which system received final acceptance) within 3 days notification by the City. System shall be voided of water using compressed air or similar method accepted by Parks Project Manager. Reopen, operate and adjust system malfunctions accordingly during April of following season within 3 days of notification by City.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Equipment must have performance characteristics to operate per the design conditions indicated. If any discrepancy or conflict exists between the quantities of equipment listed in the schedule and quantities shown on the Drawings, the Drawings shall govern.
- B. All material shall be of the highest grade possible and where applicable, shall be marked accordingly. All material shall be new.

2.2 PIPE AND PIPE FITTINGS:

- A. Main and Lateral Lines:
1. Main Lines (pressurized, downstream of backflow prevention units):
 - a. Class 200 PVC BE (size 1-1/2" through 2")
 - b. Class 200 PVC RT (size 2-1/2" and larger).
 - c. All PVC pipe will conform to the requirements of the United States Department of Commerce commercial standard Type 1-ASTM-D-2241.
 2. Lateral Lines: 100 PSI High Density NSF Polyethylene Piping - 1" minimum diameter.
 - a. Velocity of water flow in polyethylene pipe shall not exceed 7-1/2 feet per second.
 3. Main line water flow velocity shall not exceed five (5) feet per second.
- B. Sleeving:
1. Horizontal sleeves under paved surfaces: Class 200 PVC.

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Section 02810 – Irrigation Systems (Continued)

2. Vertical sleeves for access to drains and valves: Class 200 PVC.
3. Horizontal sleeving for boring applications: HDPE

C. Brass Pipe and Fittings:

1. Brass Pipe - 85% red brass, ANSI Schedule 40 screwed pipe.
2. Fittings - Medium brass, screwed 125 pound class.

D. Plastic Pipe and Fittings:

1. Identification Markings: Identify all pipe with following indelible markings:
 - a. Manufacturer's name.
 - b. Nominal pipe size.
 - c. Schedule of class.
 - d. Pressure rating.
 - e. NSF (National Sanitation Foundation) seal of approval.
 - f. Date of extrusion.
2. Gasketed End Pipe (Pressurized main line 2-1/2" and larger) – Manufactured from virgin Polyvinyl Chloride compound in accordance with ASTM D2241 and ASTM D1784; cell classification 1254-B, Type 1, Grade 1.
 - a. All fittings and service tees (2-1/2" and larger) – Ductile iron, grade 70-55-05 in accordance with ASTM A-536. Fittings shall have deep bell push-on joints with factory installed gaskets meeting ASTM F-477.
 - b. Lubricant – As recommended by manufacturer of pipe fittings.
 - c. Pipe Restraints on all fittings and service tees - Leemco, installation as recommended by manufacturer.
3. SDR21-200 PVC pipe (Pressurized main line 2").
 - a. Pipe will be assembled with Schedule 80 PVC fittings using ASTM-F-656 purple primer followed with heavy bodied ASTM-D-2564 glue.
 - b. Fittings shall be installed with thrust blocks as per Detail.
4. Flexible Plastic Pipe (non-pressure lateral lines): Manufactured from virgin polyethylene in accordance with ASTM D2239, designated as PE 3408.
 - a. Fittings - Manufactured in accordance with ASTM D2609; PVC Type 1 cell classification 12454-B.
 - b. Clamps - All stainless steel worm gear screw clamps. Use 2 clamps per joint on all insert fittings.
 - c. Risers for Pop-up Heads - Shall be swing pipe, 0.49 ID, operating pressure of 80 PSI, manufactured by Rainbird or equal.

2.3 VALVES:

A. Gate Valve or Isolation Valve:

1. Valve: Shall be cast iron body, flanged, left-hand opening, square nut operated, rubber resilient seated, mechanical joint AWWA gate valve with clear waterway equal to full diameter of pipe. Shall be able to withstand continuous working pressure of 150 PSI. Wheel type handle is unacceptable.

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B. Automatic Control Valve:

1. Automatic Valve for Potable Water System: Rain Bird PEB-PRS-D Series Valve having manual flow adjustment and manual bleed nut.
2. Automatic Valve for Non-Potable Water System: Rain Bird PESB-PRS-D Series Valve.
3. Manifold: Manifold to be constructed out of Schedule 80 PVC pipe, fittings, and nipples, with ductile iron riser nipple, Champion brass body 300RS angle valve with integral brass union as per details and plans.

C. Manual Drain Valve:

1. Drain Valve: Mueller Oriseal #H-10284 or MacDonald AY 1” 3061 with brass swing joint assembly.

D. Quick Coupling Valves:

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

E. Master Valve and Flow Sensor Assembly:

1. As specified per plans and details.

F. Valve Boxes:

1. Isolation Valves, Quick Coupling Valves, Drain Valves, Wire Splices and Ground Rods - Carson Brooks 10” round box,
 - a. Brand Lids: Isolation/Gate Valve with “GV”, Quick Couper Valve with “QC”, Manual Drain Valve with “DV”, Air Relief Valve with “AR” and Wire Splice Box with “SB”.
2. Electric Control Valve Box: Shall have locking cover branded with the zone number.
 - a. Single or double valve location only, 3/4 inch through 2 inch: Carson Brooks #1220 jumbo box or approved equal with 910-4 bolt down T-cover.
 - b. Multiple valve clusters, 3/4 inch through 2 inch, max. four (4) control valves per box: Carson Brooks #1730-18 box or approved equal with 910-4 bolt down T-cover.
3. Box Color for valves: green for potable systems, purple for non-potable systems.
4. Gravel Leveling Bed and Drainage Sump in Valve Boxes: 3/4” crushed gravel wrapped in geotextile, as indicated on Drawings.

G. Backflow Preventer:

1. High hazard, reduced pressure type, approved by USC or other approved testing laboratory; fully ported, balltype gate valves on units 2” or smaller, resilient gate valves on units larger than 2”; as manufactured by Febco or approved equal.
2. Backflow Preventer Cover: Guardshack enclosure of appropriate size, equipped with Lock Shield Brackets, manufactured by BPDI, phone: 800-266-5411. Color: forest green.
3. Concrete Pad: Comply with Section 02520.

H. Air Relief Valve:

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1. On systems 2-1/2” or larger: Bermad 4415 (all cast iron) 2” double purpose vacuum air release valve.
 - I. Pressure Reducing Valve:
 1. Watts commercial grade or equal.
- 2.4 SPRINKLER HEADS:
- A. Heads: Provide fabricated riser units of the type and size as indicated on the Drawings. Heads of a specific type or function in the system shall be of the same manufacturer and shall be marked with the manufacturer’s name and identification in such a position that they can be identified without being removed from the system.
 1. Pop-Up Sprinkler Heads in turf areas: Rain Bird 1804 SAM-PRS-D or 1806 SAM-PRS-D.
 2. Pop-Up Sprinkler Heads in native grass areas and flower beds: Rain Bird 1812 SAM-PRS-D.
 3. Pop-Up Sprinkler Nozzles shall be Rain Bird U-Series nozzle. Strip series, rotary or MPR nozzles may be used for specific approved applications.
 4. Gear Driven Heads: Hunter I-20, I-25, I-40 or Rain Bird 3500, 5000 Plus, 5500, 7005 or 8005 series with stainless steel risers, SAM, PRS and MPR options as available.
 - B. Flexible Connectors to Lateral Pipe:
 1. Pop-up Heads: Shall be Rain Bird Swing Pipe, 1/2” SPX Series, connected to lateral pipe with PVC insert fittings.
 2. Gear Driven Heads: Shall be field constructed swing joints as per detail, connected to lateral pipe with PVC insert fittings.
- 2.5 LOW VOLUME IRRIGATION
- A. Valve – Rain Bird PEB-PRS-D, installed in Carson Brooks #1220 jumbo box or approved equal with 910-4 bolt down T-cover. Brand Lid with zone number included.
 1. All low volume irrigation shall be zoned independently from turf, and product applications may not be mixed within zone
 - B. Lateral pipe – Flexible polyethylene pipe as per specifications 2.2.D.4. See Drawings for installation depth.
 - C. Sub-surface irrigation – Netafim Techline CV, 0.26 or .4 GPH emitter with 12” or 18” spacing. See Drawings for installation and depth of pipe.
 1. Requires Netafim 120 mesh filter in Carson 1419-12 valve box with corner hex bolt down cover. Brand lid with “FIL”.
 2. Flush valve in Carson round 10” valve box with bolt down T-cover as per Drawings. Brand lid with “FV”.
 - D. Tree/Shrub Bubblers – Rain Bird 1400 series Tree and Shrub Bubbler installed as per Drawings.
 1. Bubbler discharge rate must not exceed soil infiltration rate.
 2. Top of bubbler shall not exceed 2” height above mulch/soil surface.

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Section 02810 – Irrigation Systems (Continued)

2.6 AUTOMATIC CONTROL SYSTEM:

A. Automatic Controller:

1. Central Control systems are required on all sites unless a variance is granted by Denver Parks Water Conservation.
 - a. Provide one hand-held remote control unit for each Controller specified.
2. If variance is granted, Controller must have the following minimum characteristics:
 - a. Solid state, 14-day clocks, with multiple programming capability.
 - b. Capable of opening normally closed electric solenoid type valve.
 - c. Automatic Timing: Capable of incremental units from 3 to at least 60 minutes per station.
 - d. Ability to provide repeat and/or syringe cycle capabilities and ability to eliminate or isolate one station without disturbing remaining controller features.
 - e. Flow sensing capability
 - f. Minimum 40 VA transformer rating
3. Controller and remote control equipment: Manufacturer/Model shall be noted on Drawing.
4. Controller Enclosure:
 - a. Weatherproof enclosure with grounding per manufacturer recommendations, outside disconnect, inside fused disconnect, interior duplex outlet, and Xcel service pole number permanently marked inside enclosure. Toro Sentinel Central Controller requires ventilation louvers and exhaust fan.
 - b. Acceptable product: Stainless steel Strongbox or Hoffman Enclosure of appropriate size, or approved equal.
 - c. Color shall be Federal Green or Tiger Drylack powder-coated finish color 6005.
5. Concrete Pad: Comply with plan detail and Section 02520.

B. Electrical Control Wiring:

1. Low Voltage:
 - a. Electrical Control Wire for 24VAC solenoid – Golf Course Sprinkler Wire - #14 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation .045” thickness.
 - i. #14 AWG up to 1,210 linear feet distance of wire run
 - ii. #12 AWG up to 1,350 linear feet distance of wire run
 - iii. #10 AWG up to 1,460 linear feet distance of wire run
 - b. Electrical Common Wire – Golf Course Sprinkler Wire - #12 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation .045” thickness.
 - i. #12 AWG up to 1,350 linear feet distance of wire run
 - ii. #10 AWG up to 1,460 linear feet distance of wire run
 - c. Data Wires – Golf Course Sprinkler Wire - #14 AWG UL approved direct burial solid conductor copper wiring with polyethylene insulation .045” thickness.
 - d. Wire Colors: Consistent color system throughout.
 - i. Control Wires – Black.
 - ii. Common Wires – White.
 - iii. Spare Control Wires – Red.
 - iv. Spare Common Wires – Purple.
 - v. Data Wires – Green and Blue
 - vi. Tracer Wire – Yellow
 - e. Control Wire connections and splices shall be made with 3M DBM direct bury splice, or similar UL listed dry splice methods.
2. `Splice Box: Carson Brooks 10” round box, branded “SB.”
3. Mainline Tracer Wire – Install one continuous AWG UL No. 10 tracer wire as detailed above all mainline. Loop wire into control box. Color shall be yellow.

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4. High Voltage – Type required by local codes and ordinances, of proper size to accommodate needs of equipment serviced.

2.6 MISCELLANEOUS MATERIALS:

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

PART 3 – EXECUTION

3.1 PREPARATION:

- A. Utility Locates: Contact Utility Notification Center of Colorado at or 8-1-1 or 1-800-922-1987 prior to any excavation, for the marking of underground member utilities. The indication of utilities on the Drawings does not relieve the Contractor of the responsibility for utility location. Route trenches to avoid existing utilities. Verify with the Parks Project Manager any required relocation prior to installation.
- B. Landscape Plan Review and Coordination: Contractor will be held responsible for coordination between landscape and irrigation system installation. Landscape material locations shown on the Landscape Plan shall take precedence over the irrigation system equipment locations. If irrigation equipment is installed in conflict with the landscape material locations shown on the landscape plan, the Contractor will be required to relocate the irrigation equipment, as necessary, at Contractor's expense.
- C. Pressure Verification: Contractor shall field verify the static pressure and verify Gallons Per Minute flow at the project site, prior to commencing Work or ordering irrigation materials, and submit findings, in writing, to Parks Project Manager. If Contractor fails to verify static water pressure and flow prior to commencing Work or ordering irrigation materials, Contractor shall assume responsibility for all costs required to make system operational and the costs required to replace any damaged landscape material. Damage shall include all required material costs, design costs and plant replacement costs.
- D. Inspection: Examine areas and conditions under which Work of this Section is to be performed. Do not proceed with Work until unsatisfactory conditions have been corrected.
 1. Grading operations, with the exception of fine grading, shall be completed and approved by Parks Project Manager before staking or installation of any irrigation system begins.
- E. Layout: Lay out and stake system before beginning installation. Staking shall occur as follows:
 1. Mark, with paint, routing of pressure supply line and flag heads for all new zones. Contact Parks Project Manager 48 hours in advance and request review of staking. Parks Project Manager will advise installer as to the amount of staking to be prepared. Parks Project Manager will review staking and direct changes if required. Review does not relieve installer from coverage problems due to improper placement of heads after staking.

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2. If project has significant topography, freeform planting beds, or other amenities which could require alteration of irrigation equipment layout as deemed necessary by Parks Project Manager, do not install irrigation equipment in these areas until Parks Project Director has reviewed equipment staking.
3. Parks Project Manager may request Parks Forestry approval of proposed trenching prior to start of trenching.
4. Review backflow prevention device location and operation with Parks Project Manager prior to mainline installation.

3.2 EXCAVATION AND BACKFILL:

- A. Install mainline pipe and wire sleeving under existing asphalt paving, concrete walks and critical root zones by directional boring. Pot-hole existing utilities for location and depth in advance of boring operations. When pot-holing in cross streets: include all permits, traffic control, backfill, compaction and surface restoration as required by the City and County of Denver Transportation Engineering Standards and Specifications. Compact backfill around end of sleeves to 90% S.P.D. per ASTM D698 in landscape areas.
- B. Excavation:
 1. Trenching:
 - a. Trench excavation shall follow, as much as possible, layout shown on Drawing. Dig trenches straight and support pipe continuously on bottom of trench. Trench bottom shall be clean and smooth with all rock and organic debris removed. Comply with OSHA standards for all trenching and excavation.
 - b. Trenching under limb spread of existing trees: Accomplish by hand or other method that will not damage limbs or branches. Keep trenches at least 6 feet from trunk of existing trees. Refer to Section 02150: Tree Retention and Protection for additional precautions.
 2. Clearances:
 3. Main pressure line: Make trenches of sufficient width to properly assemble and position pipe in trench. Clearances:
 - a. Piping 2-1/2 Inches and Larger: Minimum clearance of piping 3 inches or larger shall be 5 inches horizontally on both sides of the trench.
 - b. Piping 2 Inches and Smaller: Trenches shall have a minimum width of 4 inches.
 - c. Line Clearance: Provide min. 6 inches of clearance between each line, and min. 12 inches of clearance between lines of other trades.
 - d. Lateral pipe: Trenches shall have a minimum width of 4 inches.
 - e. Line Clearance: Provide not less than 6 inches of clearance between each line, and not less than 12 inches of clearance between lines of other trades.
 4. Pipe and Wire Depth to finish grade:
 - a. Pressure Supply Piping within Parks – 30” from top of pipe (maximum variation 2”).
 - b. Pressure Supply Piping within Right-of-Way – 24” from top of pipe (max. variation 2”).
 - c. PVC Sleeving – at specified pipe or wire depth.
 - d. Non-pressure Piping (gear driven heads) – 18” from top of pipe (maximum variation 2”).
 - e. Non-pressure Piping (pop-up heads) – 18” from top of pipe (maximum variation 2”).
 - f. Control Wiring – Side of pressure main when installed in the same trench; 24” from top of wire bundle where installed separately from mainline trench.
 5. Boring will be permitted only where pipe must pass under obstruction(s) which cannot be removed. In backfilling bore, final density of backfill shall match that of surrounding soil. It is acceptable to use sleeves of suitable diameter installed first by jacking or boring, and pipe laid through sleeves. Observe same precautions as though pipe were installed in open trench.
 6. Vibratory Plow: Not permitted without written authorization of Parks Project Manager.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

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

A. Sleeving:

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

B. Installation of Piping:

- 1. PVC Mainlines:
a. Snake pipe in trench as much as possible to allow for expansion and contraction. Place manual drain valves at low points and dead ends of pressure supply piping to insure complete drainage of system. When pipe laying is not in progress, or at end of each day, close pipe ends with tight plug or cap. Perform Work in accordance with good practices prevailing in piping trades.
b. Slope pipe at minimum 3" per 100' to manual drain valve and drainage sump. Field adjust as needed.
c. Solvent Weld PVC Pipe (all pipes 2" and smaller): Lay pipe and make all plastic to plastic joints in accordance with manufacturer's recommendations. Do not install pipe when air temperature is below 40 degrees (F).
d. Gasketed End Pipes: Lay pipe and make pipe-to-fitting or pipe-to-pipe joint, following OR70 recommendations (Johns-Manville Guide for Installation of Ring-Tite Pipe), or pipe manufacturer's recommendations. Install Leemco pipe restraints on all fittings per manufacturer's recommendations.
2. Thrust Blocks on 2" PVC mainline: Construct thrust blocks behind all fittings, tees, bends, reducers, line valves and caps as per plans. Contact Parks Project Manager prior to placing thrust blocks, for observation of thrust block excavation and initial placement. Size thrust blocks based on table below and per plan:

Table with 2 columns: Soil Type and lbs./SF. Rows include Mulch, Peat, etc. (0), Soft Clay (500), Sand (1,000), Sand and Gravel (1,500), Sand and Gravel with Clay (2,000), Sand and Gravel Cemented with Clay (4,000), and Hard Pan (5,000).

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

3. Flexible Plastic (Polyethylene) Pipe – Lay pipe and assemble fittings according to manufacturer's recommendations.

C. Control Wiring:

1. Low Voltage Wiring:
 - a. Bury control wiring between controller and electric valves in pressure supply line trenches, strung as close as possible to main pipe lines with such wires to be consistently located below and to one side of pipe, or in separate trenches.
 - b. Bundle all 24 volt wires at 10 foot intervals and lay with pressure supply line pipe to one side of the trench.
 - c. Provide an expansion loop at every pressure pipe angle fitting, every electric control valve location (in valve box), and every 500 feet. Form expansion loop by wrapping 24" of wire around a 3/4 inch pipe and withdrawing pipe.
 - d. Make all splices and E.C.V. connections using 3M DBY & DBR connectors or similar UL listed dry splice method.
 - e. Install all control wire splices not occurring at control valve in a separate Carson Industries Model #910-10 body with 910-4 bolt down T-cover wire splice valve box with branded with WS in 1" high letters minimum.
 - f. Install one control wire for each control valve.
 - g. Run five (5) spare #14 AWG UFUL control wires and one (1) spare common wire from controller pedestal to the end of each and every leg of mainline. Label spare wires at controller and wire stub box.
2. High Voltage Wiring for Automatic Controller:
 - a. Provide 120 volt power connection to automatic controller.
 - b. All electric work shall conform to local codes, ordinances, and authorities having jurisdiction. All high voltage electrical work shall be performed by licensed electrician.

D. Installation of Valves:

1. Electric Control Valves: Install electric control valves as detailed on the Drawings.
2. Quick Coupling Valves: Install quick coupling valves as detailed on the Drawings.
3. Drain Valves: Install manual drain valves as detailed on the Drawings.
4. Install manual drain valves at all low points in pressure supply line, whether indicated on the drawing or necessitated by actual conditions, to ensure proper drainage of the mainline.
5. Isolation/Gate Valves: Install as detailed in locations shown on Drawings.
6. Valve Boxes: Install one valve box for each type of valve installed as detailed. Install gravel compaction and leveling bed after compaction of subgrade and prior to setting of valve box.
 - a. Install valve boxes flush with finish grade and square to adjacent surface features.
 - b. When valve boxes are grouped together, allow at least 24 inches between valve box sides.
 - c. Cutting of valve box to give clearance for piping or valves will not be allowed.
7. Backflow Prevention Device: Contractor must meet all applicable laws, rules and codes, including but not limited to Uniform Building codes, Plumbing Codes and State Water Regulations. Assemblies must be installed per the manufacturer's specifications. Backflow devices shall not be installed within the public right-of-way.
 - a. Install in strict accordance with current requirements of Denver Water. Connections to the Denver Water System are to have an approved assembly for the type protection they provide, either isolation or containment.
 - b. Successful Testing of backflow assembly by a certified Backflow Prevention Assembly Tester is Contractor's responsibility. Test reports shall be forwarded to Denver Water in accordance with the State of Colorado regulations. Copies of the report, the tester's certification and the certification of the testing equipment used are to be forwarded to Parks Project Manager.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

- c. Request for final payment will not be certified or processed until certification reports have been filed with Denver Water and received by Parks Project Manager.
- E. Installation of Sprinkler Heads:
- 1. Install sprinkler heads where designated after Parks Project Manager has approved Staking. Set to finish grade as detailed. Spacing of heads shall not exceed the maximum indicated on Drawing unless re-staked as directed by Parks Project Manager. In no case shall the spacing exceed maximum recommended by manufacturer.
 - 2. Install gear driven heads on swing-joint risers as detailed. Angled nipple relative to non-pressure line shall be no more than 45 degrees or less than 10 degrees.
 - 3. Install pop-up heads on swing pipe as detailed.
 - 4. Adjust part circle heads for proper coverage. Adjust heads to correct height after sod is installed. Plant placement shall not interfere with intended sprinkler head coverage, piping, or other equipment. Parks Project Manager may request nozzle changes or adjustments without additional cost to the City.
- F. Backfilling:
- 1. Do not begin backfilling operations unless authorized by Parks Project Manager and all required systems tests have been completed. Backfilling shall not be done in freezing weather unless authorized by Parks Project Manager. Leave trenches slightly mounded to allow for settlement after backfilling is completed. Trenches shall be finish graded prior to walk-through of system by Parks Project Manager.
 - 2. Materials - Excavated material is generally considered satisfactory for backfill purposes. Backfill material shall be free of rubbish, vegetable matter, frozen materials, and stones larger than 1 inch in maximum dimension. Do not mix subsoil with topsoil. Material not suitable for backfill shall be hauled away. Contractor shall be responsible for providing suitable backfill if excavated material is unacceptable or not sufficient to meet backfill, compaction, and final grade requirements.
 - 3. Do not leave trenches open for a period of more than 48 hours. Open excavations shall be protected in accordance with OSHA regulations.
 - 4. Compact backfill to 90% S.P.D., determined in accordance with ASTM D698 utilizing the following methods in landscape areas:
 - a. Mainline Pipe: Backfill in three uniform lifts and hydraulically compact the first lift and mechanically compact the second and third lifts.
 - b. Secondary Pipe: Backfill in two uniform lifts and hydraulically or mechanically compact each.
 - c. Puddling or ponding and/or jetting is prohibited within 20 feet of building or foundation walls.
- G. Sleeving Under Paving:
- 1. Provide for a minimum cover of 18 inches between the top of the sleeve and the bottom of the aggregate base for all pressure and non-pressure piping installed under asphaltic concrete or concrete paving.
 - 2. Sleeving located under areas where asphalt or concrete paving will be installed shall be bedded with sand (a layer 6" below pipe and 6" above pipe).
 - 3. Compact backfill material in 6" lifts at 95% S.P.D. determined in accordance with ASTM D698 using manual or mechanical tamping devices under pavement.
 - 4. Set in place, cap and pressure test all piping under paving, in presence of Parks Project Manager prior to backfilling and paving operations.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

5. Sleeving under existing walks or concrete pavement shall be done by directional boring. Where cutting or breaking of walks and/or concrete is necessary, it shall be done and replaced at no cost to the City. Obtain permission to cut or break walks and/or concrete from Parks Project Manager.

H. Automatic Control System:

1. Controller:
 - a. Install controller and controller enclosure in accordance with the Drawings and with the manufacturer's instructions
 - b. Provide electrical ground per manufacturer's recommendations.
 - c. Install above ground wiring in rigid conduit in accordance with applicable codes.
 - d. Coordinate installation with electrical work to insure electrical power supply line(s) are provided to controller location(s).
2. Miscellaneous Items:
 - a. Rain Sensor: Install in accordance with manufacturer's instructions, located as per Drawing.

3.4 FIELD QUALITY CONTROL:

- A. Flushing: After piping, risers, and valves are in place and connected, but prior to installation of sprinkler heads, quick coupler assemblies, and hose valves, thoroughly flush piping system under full head of water pressure from dead end fittings. Maintain flushing for 5 minutes through farthest valves. Cap risers after flushing.
- B. Testing: Conduct tests in presence of Parks Project Manager. Arrange for presence of Parks Project Manager 48 hours in advance of testing. Supply force pump and all other test equipment.
 1. Set in place, cap and pressure test all piping under paving, in presence of Parks Project Manager prior to backfilling and paving operations.
 2. After backfilling and installation of all control valves, fill pressure supply line with water, and pressurize to 40 PSI over the designated static pressure or 120 PSI, whichever is greater, for a period of 2 hours.
 3. Leakage, Pressure Loss: Test is acceptable if no loss of pressure is evident during the test period.
 4. Leaks: Detect and repair leaks. Replace defective PVC pipe with new full length pipe section. No pipe splices will be accepted within pipe sleeve. No PVC pressure couplings or slip-fix repair couplings will be allowed.
 5. Retest system until test pressure can be maintained for duration of test.
 6. Before final acceptance, pressure supply line shall remain under pressure for a period of 48 hours with no evidence of leaks or failures.
- C. Walk-Through for Substantial Completion:
 1. Arrange for Parks Project Manager's presence 48 hours in advance of walk-through.
 2. Entire system shall be completely installed and operational and trenches shall be finish graded prior to scheduling of walk-through.
 3. Electrically operate each zone in its entirety for Parks Project Manager at time of walk-through. Project inspection by Parks Project Manager shall include:
 - a. Review operation, coverage, head/nozzle adjustment, and system adjustment per specifications.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

- b. Open all valve boxes to confirm materials, gravel bedding, compaction, elevation, workspace access within boxes, clearance from lid and bedding, locking mechanisms, and zone branding. Interior of boxes should be free of visible soil. All valves must be tagged with zone identification and valve box lids must be branded with zone valve identification. Verify connections in all zone valve and wire splice boxes.
 - c. Contractor shall resistance test all spare common and hot wires for continuity in the presence of Parks Project Manager.
 - d. Confirm irrigation heads are at specified elevation and distance from paved surfaces and curbs, plumb and soil compacted.
 - e. Inspect concrete size and elevation of pads for backflow assemblies, master valves, and enclosure pads. Confirm quality of concrete, finish, access, spare conduit/sleeving as required for wiring.
 - f. Confirm quality of controller enclosure and mounting (there must be no gap between controller and concrete), grounding, high voltage installation, low voltage wiring, ID tagging of wires in controller, and communication set up. Each controller must have a color-coded zone chart and programming chart as per specifications.
 - g. Contractor shall submit written certification that proper grounding for all controllers has been installed to Owner.
 - h. Review trench and related excavation repair including backfill, compaction, fine grade, seed and sod installation.
 - i. Review appropriate use of purple valve lids and other product as required for reuse water applications.
4. Generate a punch list of items to be corrected prior to Final Completion.
 5. Furnish all materials and perform all work required to correct all inadequacies of coverage due to deviations from Contract Documents.

D. Walk-Through for Final Completion:

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

3.5 ADJUSTING:

- A. Upon completion of installation, "fine-tune" entire system by regulating valves, adjusting patterns and break-up arms, and setting pressure reducing valves at proper and similar pressure to provide optimum and efficient coverage. Flush and adjust all sprinkler heads for optimum performance and to prevent overspray onto walks, roadways, and buildings as much as possible. Heads of same type shall be operating at same pressure +/- 7%.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02810 – Irrigation Systems (Continued)

- B. If it is determined that irrigation adjustments will provide proper coverage and improved water distribution as determined by the Parks Project Manager, Contractor shall make such adjustments prior to Final Acceptance as directed, at no additional cost to the City. Adjustments may also include changes in nozzle sizes, degrees of arc, and control valve throttling.
 - C. All sprinkler heads shall be set perpendicular to finish grade unless otherwise designated.
 - D. Areas that do not conform to designated operation requirements, due to unauthorized changes or poor installation practices, shall be immediately corrected at no additional cost to the City.
- 3.6 CLEANING - Maintain continuous cleaning operation throughout duration of Work. Dispose of, off-site at no additional cost to the City, all trash, excess soil or debris generated by installation of irrigation system.

End Denver Parks Section 02810

Section 02920 – Soil Preparation

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Preparation of soil for the purpose of seeding, sodding or planting operations. Soil preparation consists of ripping, fertilizing, soil conditioning and fine grading the topsoil. Soil preparation as specified herein MUST precede all seeding, sodding and planting.
 - B. Related Work:
 - 1. Topsoil – Section 02925
 - 2. Turfgrass Seeding – Section 02932
 - 3. Native Seeding – Section 02933
 - 4. Sodding – Section 02935
 - 5. Trees and Shrubs - 02950
- 1.3 SUBMITTALS:
- A. Quality Control Submittals:
 - 1. Certificates: State, federal and other inspection certificates shall accompany invoice for materials showing source or origin. Submit to Project Manager prior to acceptance of material.
 - 2. Material Analysis: Provide soil conditioner analysis performed no more than 3 months prior to delivery to site.
- 1.4 DELIVERY, STORAGE AND HANDLING:
- A. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, bearing name and warranty or producer.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02920 – Soil Preparation (Continued)

- B. Notify Project Manager of delivery schedule in advance so material can be inspected upon arrival at project site. Immediately remove unacceptable material from project site.

1.5 PROJECT/SITE CONDITIONS:

- A. General: Do not perform work when climate and existing site conditions will not provide satisfactory results.
- B. Vehicular accessibility on site shall be as directed by the Project Manager. Repair damage to prepared ground and surface caused by vehicular movement during work under this section to original condition at no additional cost to the City.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS:

- A. Topsoil: Shall be as specified under Section 02925 - Topsoil.
- B. Soil Conditioner:
 - 1. Composted material shall consist of aged organic matter, free of weed or other noxious plant seeds, lumps, stones, or other foreign contaminants harmful to plant life, and having the following characteristics based on a nutrient test performed no longer than 3 months prior to its incorporation into the project:
 - a. Organic matter: 25% minimum.
 - b. Salt content: 5.0 mmhos/cm maximum
 - c. pH: 8.5 maximum.
 - d. Carbon to nitrogen ratio of 10:1 to 20:1.
 - 2. Mountain peat, aspen humus, gypsum and sand will not be accepted.
 - 3. Acceptable product: Class I compost, such as Ecogro or Bio-comp, as produced by A1 Organics, Eaton, CO, or approved equal.

2.2 FERTILIZER:

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

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02920 – Soil Preparation (Continued)

2.3 HERBICIDE:

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

PART 3 - EXECUTION

3.1 EXAMINATION:

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

3.2 PREPARATION

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

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02920 – Soil Preparation (Continued)

B. Areas of Compacted Topsoil:

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

C. Areas of Disturbed Topsoil:

1. If the areas are disturbed but not severely compacted, shattering for aerification alone should be sufficient to prepare the soil for revegetation.

D. Areas of Undisturbed Natural Topsoil:

1. Undisturbed sites that are or were supporting healthy plant growth need only surface seedbed preparation prior to sowing seed.

3.3 INSTALLATION

A. Soil Preparation in Turf Grass Areas:

1. Apply amendments at the following rates:
 - a. Soil conditioner: 4 cubic yards per 1000 square feet
 - b. Diamonium phosphate: 2 lbs. of nitrogen per 1000 square feet
2. After applying soil conditioner and fertilizer, thoroughly till area to depth of 6" minimum by plowing, harrowing, or disking until soil is well pulverized and thoroughly mixed.

B. Soil Preparation in Native Grass Areas:

1. Apply soil conditioner at the rate of 4 cubic yards per 1000 square feet.
2. After applying soil conditioner, thoroughly till area to depth of 6" minimum by plowing, harrowing, or disking until soil is well pulverized and thoroughly mixed.

C. Fine Grading in all Landscape Areas:

1. Do fine grading for all areas prior to seeding or planting. Allow for natural settlement.
2. For ground surface areas surrounding buildings to be landscaped, maintain required positive drainage away from buildings.
3. Establish finish grades to within 0.05 foot of grades indicated, in order to prevent "bird-baths" or ponding.
4. Finish grade to be below edge of pavement prior to sodding, seeding or planting.
 - a. Sodded Areas: Allow 1-½" for sod.
 - b. Shrub Beds: Allow 4" for mulch.
5. Noxious weeds or parts thereof shall not be present in the surface grade prior to seeding.
6. Compaction of Surface Grade Prior to Landscape Installation: Firm, but not hard (85% standard Proctor density within 2% optimum moisture).
7. Hand Raking:
 - a. Turfgrass Lawn Areas: Prior to acceptance of grades, hand rake to smooth, even surface, free of debris, clods, rocks and vegetable matter greater than ½ inch.
 - b. Native Seed Areas: Area shall not be raked smooth but left in a uniform condition after tilling. Rough raking may occur parallel to the contours only.
8. Restore planting areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02920 – Soil Preparation (Continued)

3.4 NOTIFICATION AND INSPECTION

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

3.5 CLEANING

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

3.6 PROTECTION

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

End Denver Parks Section 02920

Section 02925 – Topsoil

PART 1 - GENERAL

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

1.2 SUMMARY:

- A. Work Includes: Furnishing, stockpiling and placing topsoil on a previously prepared subgrade.
- B. Related Work:
 - 1. Soil Preparation and Fine Grading: Section 02920
 - 2. Turfgrass Seeding: Section 02932
 - 3. Native Seeding: Section 02933
 - 4. Sodding: Section 02935
 - 5. Trees and Shrubs: Section 02950

1.3 QUALITY ASSURANCE: Submit soil analysis report for imported topsoil from the State University Agricultural Extension Service or other approved soil testing laboratory. Report shall cover soil textural classification (percentages of sand, silt, and clay), pH, % organic matter, and soluble salts (electric conductivity in millimos/centimeter), and shall include additive recommendations. Testing will be at the expense of the Contractor.

1.4 DELIVERY, STORAGE AND HANDLING: Do not deliver or place topsoil in frozen, wet, or muddy condition.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02925 – Topsoil (Continued)

PART 2 - PRODUCTS

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

PART 3 - EXECUTION

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

End Denver Parks Section 02925

Section 02935 – Sodding

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Contract Conditions, Drawings and Division - 1 Specification sections apply to Work of this section.
- 1.2 SUMMARY:
- A. Work Included: Furnish and install bluegrass sod, and maintain sodded areas until Final Acceptance.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02935 – Sodding (Continued)

B. Related Work:

1. Watering - Section 02233
2. Irrigation System - Section 02810
3. Soil Preparation and Fine Grading - Section 02920
4. Topsoil – Section 02925
5. Landscaping - Section 02950

1.3 SUBMITTALS

A. Quality Control Submittals:

1. Certificates: State, Federal and other inspection certificates shall accompany the invoice for materials showing source or origin. Submit to Project Manager prior to acceptance of material.
2. At least 10 working days before anticipated date of sod delivery, submit list of varieties contained in sod for approval by Project Manager.

B. Contract Closeout Submittals:

1. Warranty: At completion of work, furnish written warranty to Owner based upon requirements as specified.

1.4 QUALITY ASSURANCE

A. Source Quality Control:

1. Sod Materials: Subject to inspection and acceptance. Project Manager reserves the right to reject at any time or place prior to acceptance, any work and sod which in the Project Manager's opinion fails to meet these specification requirements.
2. Inspection: Primarily for quality; however, other requirements are not waived even though visual inspection results in acceptance. Notify Project Manager of intended sod farm prior to cutting for inspection. Inspection at growth site shall not preclude the right of rejection at project site.
3. Promptly remove rejected sod from site.
4. Inspection will be made periodically during sodding, at completion and at end of warranty period by Project Manager.

B. Sod Standards:

1. General: Healthy, thick turf having undergone a program of regular fertilization, mowing and weed control; free of objectionable weeds; uniform in green color, leaf texture and density; healthy, vigorous root system; inspected and found free of disease, nematodes, pests and pest larvae by the entomologist of the State Department of Agriculture.
2. Each piece of Sod: Sandy-loam soil base that will not break, crumble or tear during sod installation.
3. Thickness: Minimum 3/4" thick, excluding top growth and thatch.
4. Thatch: Not to exceed 1/2" uncompressed.
5. Size: Cut in strips 18" wide no more than 24 hours prior to delivery.

1.5 DELIVERY, STORAGE AND HANDLING

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02935 – Sodding (Continued)

- A. Sod: Deliver on pallets properly loaded on vehicles and with root system protected from exposure to sun, wind, and heat in accordance with standard practice and labeled with botanical and common name of each grass species in accordance with Federal Seed Act. Sod that has been damaged by poor handling or improper storage is subject to rejection by the Project Manager.
 - 1. Protect from dehydration, contamination, freezing and heating at all times. Keep stored sod moist and under shade or covered with moistened burlap.
 - 2. Do not drop sod rolls from carts, trucks or pallets.
 - 3. Do not deliver more sod than can be installed within 48 hours.
 - 4. Do not stack sod more than 2 feet deep.

- B. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, warranty and conformance to state law.
 - 1. Material shall be inspected upon arrival at job site.
 - 2. Immediately remove unacceptable material from job site.

1.6 PROJECT/SITE CONDITIONS

- A. Existing Conditions:
 - 1. Import and place any fill material required to adjust the fine grade to meet drainage requirements or to match hard surface finish grades.
 - 2. Vehicular accessibility on site shall be as directed by Project Manager. Repair damage to prepared grounds and surfaces caused by vehicular movement during work under this section to original condition at no additional cost to Owner.

- B. Environmental Requirements:
 - 1. If possible install sod between spring and fall: April 15 - October 1 or anytime irrigation is available daily for one month and once a week for several months (especially for fall/winter sodding).
 - 2. Do not install sod on saturated or frozen soil.
 - 3. Schedule work for periods of favorable weather. Sod placement on days which, in the opinion of the Project Manager, are too hot, dry or windy for optimal installation may be prohibited.

1.7 MAINTENANCE

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

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02935 – Sodding (Continued)

B. Maintenance:

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

C. Final Acceptance:

1. At the end of the Maintenance Period, the Project Manager will, upon written notice of end of Maintenance Period, inspect the work for Final Acceptance. Request shall be received at least ten calendar days before the anticipated date for Final Inspection.
2. Upon completion and re-inspection of full repairs or replacements necessary in the judgment of the Project Manager at that time, the Project Manager will recommend that Final Acceptance of the Work of this Section be given.
3. Sod areas will be accepted when in compliance with all the following conditions:
 - a. Roots are thoroughly knit to the soil.
 - b. Absence of visible joints.
 - c. All areas show a uniform stand of specified grass in healthy condition, free of weeds, diseases and other visible imperfections.
 - d. At least 30 days have elapsed since the completion of Work under this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

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

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02935 – Sodding (Continued)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Protection:
 - 1. Be responsible for proper repair to landscape, utilities, walls, pavements, and other site features damaged by operations under this section.
 - 2. Identify prepared sod areas requiring protection and erect barriers for proper protection and traffic control.
- B. Sodded Areas: Remove weeds, debris and rocks larger than ½". Dispose of accumulated debris at direction of Project Manager.
- C. Repair: Re-establish grade and specified conditions to damaged sod areas prior to placing sod.
- D. Adjustment: Adjust irrigation heads to proper watering height according to depth of sod material but lower than compacted blade height to enable lawn mowers to cut grass freely without damage to the sprinkler system.
- E. Fine Grading: Perform as required to maintain positive drainage, prevent ponding and direct run-off into catch basins, drainage structures, etc., and as required to provide smooth well-contoured surface prior to proceeding. Tolerance: ± 0.04 foot.

3.3 SODDING

- A. Sodding:
 - 1. Soil on which sod is laid: Slightly moist.
 - 2. Lay with longest dimension parallel to contours and in continuous rows.
 - 3. Tightly butt ends and sides of sod together. Stagger and compact vertical joints between sod strips by rolling so sod will be incorporated with the ground surface, insuring tight joints between adjacent pieces. Ensure that sod is neither stretched nor overlapped.
 - 4. Exposed joints due to shrinkage will require replacement of sod in affected areas.
- B. Topsoil: Add along exposed edges to match adjacent grade. Feather topsoil out approximately 1 ft. from edge of sod. Broom screened topsoil over entire sodded area to fill voids but do not smother sod.

DENVER PARKS DEPARTMENT SPECIFICATIONS

Section 02935 – Sodding (Continued)

- C. Rolling: When soil and sod are moist, roll sod lightly as soon as possible after it is laid. Roller shall weigh 100 to 160 lb per foot of roller. Delay rolling until just before the second watering.
- D. Drainage: Assure that finished areas of sod are graded such that positive drainage of storm and irrigation water will occur and ponding of water will be minimized.
- E. Watering: Thoroughly water sod immediately after laying to a depth sufficient that the underside of the new sod strips and soil below the sod are thoroughly wet.

3.4 FERTILIZING

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

3.5 REPAIR OF EXISTING LAWN AREAS DISTURBED BY RENOVATION

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

3.6 CLEANING

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

3.7 PROTECTION

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

End Denver Parks Section 02935

End Section Denver Parks Department Specifications

CITY AND COUNTY OF DENVER

STATE OF COLORADO



DEPARTMENT OF PUBLICWORKS /

Drawings

Contract No. 201207522

SHE 2011 PKG 2 - TRAFFIC SIGNAL UPGRADE

August 29, 2012

Oversight / NHS

FHWA REGION VIII OVERSIGHT? NO YES

NATIONAL HIGHWAY SYSTEM? NO YES

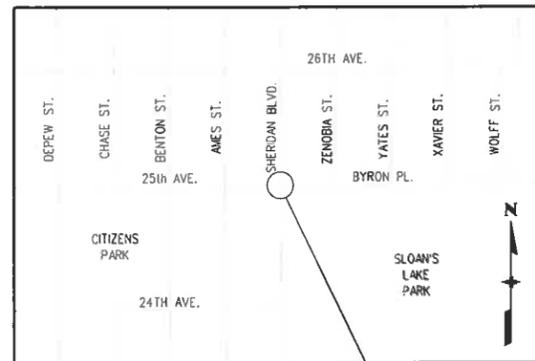
DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED FEDERAL AID PROJECT NO. SHE R600-391 SUBACCOUNT NO. 18197 2011 SAFETY HAZARD ELIMINATION PROJECT PACKAGE 2 CITY AND COUNTY OF DENVER PILAR NO. 2011-0525 PCO TRACKING NO. PWC2011-6008

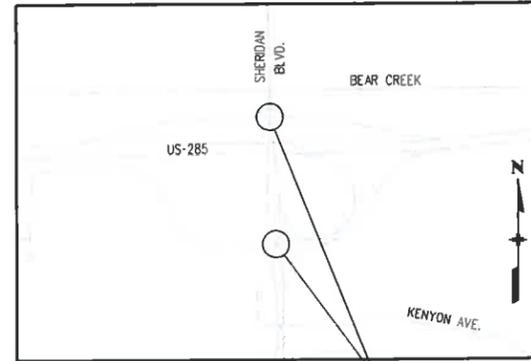
Related Projects:
P. E. UNDER PROJECT:
Project Number
Project Code:
R.O.W. Projects:
R.O.W. Project Description

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7-9	SQ1 to SQ3	SUMMARY OF APPROXIMATE QUANTITIES
10	SU1	SURVEY TABULATION SHEET
11	RMTA1	TABULATION OF REMOVALS AND RESETS
12	CGTA1	TABULATION OF CURB & GUTTER AND MISCELLANEOUS CONCRETE ITEMS
13	SSTA1	TABULATION OF STORM SEWER ITEMS
14-16	SWMP1 to SWMP3	STORMWATER MANAGEMENT PLANS
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23-28	RD1 to RD6	ROADWAY PLANS
29-42	RDT1 to RDT14	ROADWAY DETAILS
43	MDT1	MISCELLANEOUS DETAILS
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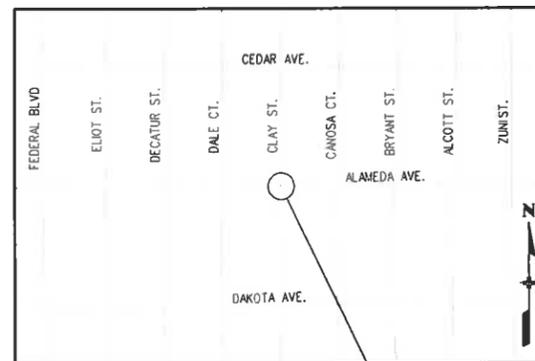
CITY & COUNTY OF DENVER
TRAFFIC ENGINEERING SERVICES
TRAFFIC SIGNAL STANDARDS
SIGN & MARKING STANDARDS



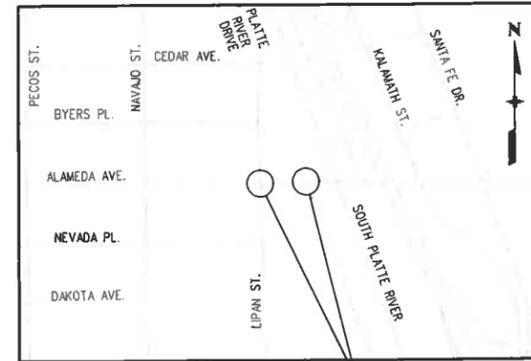
VICINITY MAP - SHERIDAN BLVD./25TH AVE.
SCALE: 1" = 1000'



VICINITY MAP - SHERIDAN BLVD./US-285
SCALE: 1" = 1000'



VICINITY MAP - ALAMEDA AVE./CLAY ST.
SCALE: 1" = 1000'



VICINITY MAP - ALAMEDA AVE./LIPAN ST.
& PLATTE RIVER DRIVE
SCALE: 1" = 1000'

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

APPROVED:	
<i>[Signature]</i>	7.24.12
MANAGER OF PUBLIC WORKS	DATE
<i>[Signature]</i>	7.24.12.
CITY ENGINEER	DATE
<i>[Signature]</i>	7/23/12
DIRECTOR OF ENGINEERING	DATE
<i>[Signature]</i>	7/17/2012
CITY TRAFFIC ENGINEER	DATE
<i>[Signature]</i>	7-23-12
OFFICE OF ECONOMIC DEVELOPMENT/USBO	DATE

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Know what's below.
Call before you dig.

Print Date: 4/25/2012
Drawing File Name: gets.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information Unit Leader Initials
CENTENNIAL ENGINEERING, INC. 5420 Ward Road, Suite 125 Arvado, CO 80002 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
Region 6

4670 N. Holly
Denver, CO 80216
Phone: 303-398-6738 FAX: 303-398-6781

As Constructed
No Revisions:
Revised:
Void:

Contract Information	
Contractor:	
Resident Engineer:	
Project Engineer:	
PROJECT STARTED: / /	ACCEPTED: / /
Comments:	

Project No./Code	SHE R600-391
	18197
Sheet Number	1

PLAN NUMBER	NEW OR REVISED	M STANDARD TITLE	PAGE NUMBER	PLAN NUMBER	NEW OR REVISED	M STANDARD TITLE	PAGE NUMBER	PLAN NUMBER	NEW OR REVISED	S STANDARD TITLE	PAGE NUMBER
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<input type="checkbox"/>	M-412-1	<input checked="" type="checkbox"/> CONCRETE PAVEMENT JOINTS (5 SHEETS) (REVISED ON DEC. 08, 2010)	25-29	<input type="checkbox"/>	M-614-1	RUMBLE STRIPS (3 SHEETS).....	116-118	<input type="checkbox"/>	S-614-12	STRUCTURE NUMBER INSTALLATION.....	153
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THE STANDARD PLAN SHEETS INDICATED HEREON BY A MARKED BOX ARE TO BE USED TO CONSTRUCT THIS PROJECT.

ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

COLORADO
 DEPARTMENT OF TRANSPORTATION
STANDARD PLANS LIST
M&S STANDARDS
 July 04, 2006
 Revised on February 24, 2011

CITY AND COUNTY OF DENVER DEPARTMENT OF PUBLIC WORKS STANDARDS AND DETAILS FOR ENGINEERING DIVISION - 2010 EDITION

- | | | | |
|------------------------------------------------------|-----------------------------------|------------------------------------------------------|----------------------------|
| <input checked="" type="checkbox"/> DRAWING NO. 7.0A | CURB RAMP NOTES & TYPICAL SECTION | <input checked="" type="checkbox"/> DRAWING NO. 8.0 | INTERSECTION VALLEY GUTTER |
| <input checked="" type="checkbox"/> DRAWING NO. 7.0B | CURB RAMP NOTES & TYPICAL SECTION | <input checked="" type="checkbox"/> DRAWING NO. 12.0 | ASPHALT PATCH |
| <input checked="" type="checkbox"/> DRAWING NO. 7.0C | CURB RAMP NOTES & TYPICAL SECTION | | |
| <input checked="" type="checkbox"/> DRAWING NO. 7.3 | CURB RAMP TYPE 3 | | |
| <input checked="" type="checkbox"/> DRAWING NO. 7.4 | CURB RAMP TYPE 4 | | |
| <input checked="" type="checkbox"/> DRAWING NO. 7.6 | CURB RAMP TRUNCATED DOMES | | |

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Print Date: 4/24/2012	Sheet Revisions			 DENVER THE MILE HIGH CITY	 Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed		STANDARD PLANS LIST			Project No./Code	
Drawing File Name: gesp01.dgn spl28th South.dgn	Date:	Comments:	Init.			No Revisions:				SHE R600-391		
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:	Designer: ACL	Structure Numbers	18197			
Unit Information Unit Leader Initials						Void:	Detailer: KJJ	Subset Sheets:	Sheet Number 2			


CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

GENERAL NOTES

1. THE CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS AND CROSS SECTIONS. ANY DISTURBANCE BEYOND THESE LIMITS SHALL BE RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR AT ITS OWN EXPENSE. CONSTRUCTION ACTIVITIES, IN ADDITION TO NORMAL CONSTRUCTION PROCEDURES, SHALL INCLUDE THE PARKING OF CONSTRUCTION VEHICLES AND EQUIPMENT, DISPOSAL OF LITTER AND ANY OTHER ACTION WHICH ALTER THE EXISTING CONDITIONS.
2. THE CONTRACTOR SHALL PROTECT ALL WORK AREAS AND FACILITIES FROM WATER INTRUSION AT ALL TIMES. AREAS AND FACILITIES SUBJECTED TO FLOODING, REGARDLESS OF THE SOURCE OF WATER, SHALL BE PROMPTLY DEWATERED AT NO COST TO THE CITY.
3. SUBGRADE MATERIALS DEEMED UNSUITABLE BY THE ENGINEER WILL BE EXCAVATED, DISPOSED OF AND REPLACED WITH AGGREGATE BASE COURSE. REMOVED MATERIALS WILL BE PAID AS UNCLASSIFIED EXCAVATION.
4. COMPACTION SHALL BE 95% OF STANDARD PROCTOR DENSITY (AASHTO T-99) FOR CLAY SOILS AND 95% OF THE MAXIMUM DENSITY (AASHTO T-180) FOR GRANULAR SOILS. RECONDITIONING SHALL BE DONE TO A DEPTH OF 6". WETTING, EXCAVATION AND COMPACTION WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
5. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS ORDERED. WATER WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND PROTECT ALL STRUCTURAL ELEMENTS, VAULTS, UNDERGROUND CONDUITS AND OTHER APPURTENANCES DURING CONSTRUCTION.
7. ALL UTILITIES SHOWN ON PLAN SHEETS ARE PLOTTED FROM AVAILABLE DATA, INCLUDING INFORMATION FROM FIELD LOCATION OF EXISTING UTILITIES. THE CONTRACTOR SHALL CONTACT ALL APPROPRIATE UTILITY COMPANIES AND THE CITY AND COUNTY OF DENVER 48 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ANY EXISTING UTILITY (INCLUDING DEPTHS) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES FROM DAMAGE. DAMAGED UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR, AT ITS OWN EXPENSE.
8. FINISHED GROUND ELEVATIONS FOR ITEMS TO BE MODIFIED, RESET OR ADJUSTED SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
9. THE CONTRACTOR IS REQUIRED TO RESET, ADJUST OR REPLACE ANY UTILITIES THAT ARE IMPACTED BY CONSTRUCTION AND DESIGNED TO REMAIN WITHIN THE PROJECT LIMITS.
10. ALL STORM DRAIN INLETS, LATERALS, MAINS AND OTHER STORM RUNOFF APPURTENANCES WITHIN THE PROJECT LIMITS SHALL BE CLEARED OF SEDIMENT AND DEBRIS IN ACCORDANCE WITH DENVER WASTE WATER MANAGEMENT DEPARTMENT STANDARDS BEFORE THE COMMENCEMENT OF CONSTRUCTION. ANY SEDIMENT AND/OR DEBRIS REMAINING IN THE STORM SEWER SYSTEM AFTER CONSTRUCTION SHALL BE REMOVED BY THE CONTRACTOR AT NO COST TO THE CITY. PAYMENT SHALL BE MADE UNDER SECTION 208 CLEAN CULVERT.
11. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE TRAFFIC CONTROL THROUGHOUT THE PROJECT INCLUDING PROPER TRAFFIC CONTROL DEVICES AND/OR PERSONNEL AS REQUIRED. A TRAFFIC CONTROL PLAN IS SUBJECT TO CITY AND COUNTY OF DENVER APPROVAL PRIOR TO COMMENCING WORK ON CITY RIGHT-OF-WAY. A COPY OF APPROVED TRAFFIC CONTROL PLANS MUST BE AVAILABLE ON SITE DURING WORK. TRAFFIC CONTROL PLANS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE MUTCD.
12. COMPLETE COORDINATION SHALL BE MAINTAINED WITH THE CITY ENGINEER.
13. WARPED RAMP SURFACES, GRADES AND CROSS SLOPES SHALL NOT CONFLICT WITH CITY AND COUNTY OF DENVER STANDARD DRAWINGS.
14. ALL WORK SHALL CONFORM TO CURRENT CITY AND COUNTY OF DENVER AND CDOT SPECIFICATIONS. IF THE CONSTRUCTION ENGINEERING INSPECTOR FINDS A PROBLEM ON THE APPROVED PLANS DURING CONSTRUCTION THAT CONFLICTS WITH A CITY STANDARD, THE INSPECTOR MAY HALT CONSTRUCTION UNTIL THE ISSUE IS RESOLVED.
15. STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM THE RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY DEPENDENT DIMENSIONS IN THE FIELD AND SHALL VERIFY ALL INFORMATION AND CONDITIONS BEFORE BIDDING THE PROJECT, AND BEFORE ORDERING OR FABRICATING ANY MATERIAL.
16. ALL RANGE POINTS, TIES, BENCHMARKS OR OTHER CITY AND COUNTY OF DENVER SURVEY CONTROL POINTS WHICH MAY BE ENCOUNTERED DURING CONSTRUCTION MUST BE PRESERVED. REFERENCE ALL LAND SURVEY CONTROL WITH A LAND SURVEY PLAT AND FILE IT WITH THE CITY AND COUNTY SURVEYOR PRIOR TO THE START OF CONSTRUCTION.
17. THE MINIMUM THICKNESS OF THE TOPSOIL SHALL BE 1 INCH IN SODDED AREAS AND 4 INCHES ELSEWHERE, AND WILL BE OBTAINED FROM THE CONTRACTOR'S SOURCES. THE TOPSOIL SHALL BE APPLIED TO ALL SURFACES INDICATED ON THE TYPICAL SECTIONS, OR AS DIRECTED BY THE ENGINEER.
18. SEEDING, SODDING AND PLANTING SHALL BE SPECIFIED, OR OTHERWISE APPROVED BY THE CITY. CONSTRUCTION, MAINTENANCE AND WATERING REQUIREMENTS SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS. WHERE LANDSCAPE RESTORATION MUST BE DELAYED DUE TO SEASONAL REQUIREMENTS, SUCH WORK MAY BE AUTHORIZED BY A SEPARATE PERMIT. ALL PAYMENT SHALL BE BY FORCE ACCOUNT.

GENERAL NOTES (CONT.)

19. STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD PLAN M-206-1.
20. CONTRACTOR IS RESPONSIBLE FOR REMOVING, RELOCATING OR REPAIRING ANY EXISTING IRRIGATION ITEMS THAT HAVE BEEN DAMAGED DURING CONSTRUCTION OR IMPACTED WITHIN THE PROJECT LIMITS.
21. ALL IRRIGATION MATERIALS USED ON THIS PROJECT ARE TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE. ANY ITEM INSTALLED WITHOUT ENGINEERING ACCEPTANCE WILL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
22. CONTRACTOR IS RESPONSIBLE FOR BEING AWARE OF, NOTIFYING, COORDINATION AND SCHEDULING ALL INSPECTIONS REQUIRED FOR FINAL APPROVALS AND PROJECT ACCEPTANCE.
23. ALL WORK AREAS SHALL BE PROPERLY PROTECTED PRIOR TO THE END OF WORK DAY; NO OPEN HOLES ARE ALLOWED OVERNIGHT. ALL WORK IS TO BE IN ACCORDANCE WITH APPLICABLE STANDARDS.
24. NO CLEATED OR TRACKED EQUIPMENT MAY WORK IN OR MOVE OVER PAVED SURFACES WITHOUT MATS.
25. IN THE EVENT THAT AN EMERGENCY REPAIR TO EXISTING FACILITIES IS NECESSARY, THE CITY INSPECTOR SHALL IMMEDIATELY BE NOTIFIED OF POSSIBLE TRAFFIC HAZARDS. EMERGENCY PROCEDURES SHALL BE COORDINATED BEFOREHAND, WHERE POSSIBLE, NO WORK WILL BE ALLOWED UNTIL NOTIFICATION IS RECEIVED. EMERGENCY TELEPHONE NOTIFICATION MUST BE FOLLOWED UP WITH A LETTER AS SOON AS POSSIBLE.
26. ANY EXISTING CURB, GUTTER, DRIVEWAYS AND SIDEWALK THAT IS FAILING OR DAMAGED SHALL BE REPAIRED OR REPLACED AS DIRECTED BY CONSTRUCTION ENGINEERING.
27. ANY CURB AND GUTTER, ASPHALT OR CONCRETE WHICH IS TO REMAIN AND IS DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
28. CONCRETE SHALL NOT BE PLACED UNTIL THE FORMS HAVE BEEN INSPECTED AND A POUR SLIP ISSUED. POUR SLIPS WILL NOT BE USED UNLESS THE CONTRACTOR HAS, AT THE JOB SITE, A COPY OF THE APPROVED PLANS BEARING THE SIGNATURE OF THE DIRECTOR OF PUBLIC WORKS AND WITH THE "APPROVED FOR CURB AND GUTTER ONLY" BLOCK INITIALED BY THE DIRECTOR OF PUBLIC WORKS' REPRESENTATIVE.
29. ALL CURB RETURNS WITHIN PUBLIC RIGHTS-OF-WAY SHALL BE CONSTRUCTED WITH CURB RAMPS IN ACCORDANCE WITH CITY AND COUNTY OF DENVER STANDARD DETAILS, LATEST EDITION, UNLESS OTHERWISE INDICATED ON THE PLANS.
30. PAYMENT FOR EMBANKMENT MATERIAL (COMPLETE IN PLACE) SHALL BE FULL COMPENSATION FOR ALL WORK NECESSARY TO COMPLETE THE ITEM INCLUDING CONSTRUCTION OF EMBANKMENTS, UNCLASSIFIED EXCAVATION, BORROW, COMPACTION, COMPACTION OF BASES OF CUTS AND FILLS, ALL WORK IN AVAILABLE MATERIALS, PITS, AND DISPOSAL OF EXPRESS EXCAVATED MATERIAL.
31. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF ALL PROPOSED AND EXISTING STRUCTURES THROUGHOUT THE DURATION OF CONSTRUCTION.
32. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE CITY. THE CITY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE CITY AND COUNTY STANDARD STANDARDS AND CDOT STANDARD SPECIFICATIONS, LATEST EDITION.
33. ADJUST ALL MANHOLES, FIRE HYDRANTS AND VALVE BOXES TO GRADE PER CITY AND COUNTY OF DENVER STANDARDS AND CDOT STANDARD SPECIFICATIONS, LATEST EDITION, AS NECESSARY.
34. PRIOR TO FINAL ACCEPTANCE, ALL DISTURBED PORTIONS OF THE CITY RIGHT-OF-WAY SHALL BE CLEANED AND RESTORED TO THE ORIGINAL CONDITION, SUBJECT TO CITY APPROVAL.
35. ANY DIGGING WITHIN THE DRIPLINE OF EXISTING TREES SHALL BE MANUALLY EXCAVATED.
36. HMA (PATCHING) (ASPHALT) SHALL BE PLACED TO MATCH THE DEPTH OF THE SURROUNDING EXISTING PAVEMENT AS DIRECTED BY THE ENGINEER. THE TOP LIFT MUST CONFORM TO THE REQUIREMENTS OF HMA (GRADING SX) (100) (PG 76-28). LOWER LIFTS MAY USE HMA (GRADING S) (100) (PG 64-22). 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 12.4, WHICH ARE AVAILABLE ON THE CCD WEBSITE.
37. ANY LAYER OF HMA PAVEMENT THAT IS TO HAVE A SUCCEEDING LAYER OF PAVEMENT PLACED THEREON SHALL BE COMPLETED FULL WIDTH BEFORE A SUCCEEDING LAYER IS PLACED.
38. WHERE IT IS REQUIRED TO CUT EXISTING PAVEMENT, THE CUTTING SHALL BE DONE TO A NEAT WORK LINE TO THE DESIRED DEPTH WITH A PAVEMENT CUTTING SAW OR OTHER METHOD AS APPROVED BY THE ENGINEER. THIS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
39. TO PROVIDE FOR ADEQUATE SULFATE RESISTANCE IN ALL CONCRETE SUPPLIED, SEVERITY OF POTENTIAL EXPOSURE SHALL BE CLASS 2 FOR THIS PROJECT. THE CONTRACTOR MAY AT ITS OWN EXPENSE HAVE A CERTIFIED LABORATORY TEST THE SUBGRADE AS PER THE CURRENT VERSION OF THE CDOT FIELD MATERIALS MANUAL. TESTING SHALL BE AT THE SAME SCHEDULE AND FREQUENCY AS REQUIRED FOR A PRELIMINARY SOIL SURVEY. THE CONTRACTOR MAY THEN PROPOSE A DIFFERENT CLASS OF EXPOSURE FOR THE PROJECT BASED ON THESE TEST RESULTS.

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Unit Information	Unit Leader Initials					Void:	Detailer:	KJJ	Numbers		Sheet Number 3	
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Region 6

GENERAL NOTES (CONT.)

- 40. DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS: FULL DEPTH FOR ALL EMBANKMENTS AND 6 INCHES FOR BASES OF CUTS AND FILLS.
- 41. A TACK COAT IS REQUIRED BETWEEN LAYERS OF BITUMINOUS PAVEMENT. DILUTED EMULSIFIED ASPHALT FOR TACK COAT SHALL CONSIST OF 1PART EMULSIFIED ASPHALT AND 1PART WATER. RATES OF APPLICATION SHALL BE AS DETERMINED BY THE ENGINEER AT THE TIME OF APPLICATION. THIS WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF ITEM 403.
- 42. FOR PRELIMINARY PLAN QUANTITIES OF HMA, THE FOLLOWING APPLICATION RATE WAS USED: 110LBS/SQ.YD./INCH OF THICKNESS.
- 43. CONCRETE FOR SIDEWALKS AND CURB RAMPS SHALL UTILIZE CLASS P CONCRETE. THE CONCRETE PAVEMENT TO BE APPLIED TO ALAMEDA AVENUE SHALL UTILIZE CLASS E CONCRETE. THE CLASS E CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI WITHIN 3 HOURS.
- 44. IT IS ESTIMATED THAT 12 INLETS WILL BE REQUIRED FOR SECTION 208 CLEAN CULVERT AS DIRECTED BY THE ENGINEER.

STORM SEWER NOTES

- 1. CALL CHRIS GONZALES AT (303) 446-3722 TO SCHEDULE INSPECTION OF ANY SANITARY AND/OR STORM FACILITIES.
- 2. ANY MODIFICATIONS, ADJUSTMENTS, CONSTRUCTION OR RECONSTRUCTION OF WASTEWATER DIVISION FACILITIES MUST BE INSPECTED BY A WMD INSPECTOR. CONTACT WMD ENGINEER AT (303) 446-3722 A MINIMUM OF 48 HOURS IN ADVANCE OF THE WORK TO SCHEDULE AN INSPECTOR.
- 3. PIPE MATERIAL, FITTINGS, TRENCHING, BEDDING, CONNECTIONS, AND SEWER INSTALLATION MUST BE INSPECTED BY WMD INSPECTORS PRIOR TO ANY TRENCH BACKFILL. CONTACT WMD ENGINEER AT (303) 446-3722 A MINIMUM OF 48 HOURS IN ADVANCE OF THE WORK TO SCHEDULE AN INSPECTOR. MONITORING OF THE PROJECT BY WMD SHALL BE FOR THE PURPOSE OF ASSURING GENERAL COMPLIANCE WITH THE APPROVED PLANS, STANDARDS, DETAILS, AND SPECIFICATIONS AS WELL AS THE RULES AND REGULATIONS. WMD INSPECTIONS SHALL NOT TAKE THE PLACE OF CONSTRUCTION INSPECTION AND MATERIALS TESTING, WHICH IS THE OWNER'S RESPONSIBILITY.
- 4. ANY QUESTIONS REGARDING WMD FACILITIES THAT ARISE DURING CONSTRUCTION SHOULD BE BROUGHT TO THE ATTENTION OF THE WMD ENGINEER AT (303) 446-3722.

DENVER PARKS NOTES (SPECIFIC TO SHERIDAN/BYRON PLACE LOCATION)

- 1. ANY DISTURBANCE OF TURF AREA (TURF AND IRRIGATION) WITHIN THE PARK ON THE SOUTHEAST CORNER OF SHERIDAN & BYRON PLACE SHALL BE REPAIRED TO EXISTING CONDITION AT CONTRACTOR'S EXPENSE AND APPROVED BY DENVER PARKS DEPARTMENT PRIOR TO FINAL PAYMENT BEING GRANTED.
- 2. ANY DISRUPTION TO THE EXISTING IRRIGATION SYSTEM WITHIN THE PARK ON THE SOUTHEAST CORNER OF SHERIDAN & BYRON PLACE SHALL BE COORDINATED WITH THE DENVER PARKS DEPARTMENT PRIOR TO THE BEGINNING OF WORK. ANY DISRUPTION TO THE EXISTING IRRIGATION SYSTEM THAT AFFECTS WATERING SHALL BE COORDINATED WITH THE PARKS DEPARTMENT. CONTRACTOR IS RESPONSIBLE FOR WATERING AFFECTED IRRIGATION ZONES TO ENSURE THAT AFFECTED LANDSCAPE AREAS (TURF, TREES, ETC.) ARE WATERED WHILE SYSTEM IS INACTIVE DURING CONSTRUCTION.

UTILITY NOTES

- 1. CONTRACTOR SHALL LOCATE NON-MEMBER UTILITIES, SUCH AS STORM SEWERS AND DITCH FACILITIES AS NECESSARY TO PREVENT DAMAGES THERETO.
- 2. IT IS SUGGESTED THE CONTRACTOR INITIATE A REQUEST TO XCEL ENERGY FOR ANY CONSTRUCTION-RELATED TEMPORARY ELECTRICAL POWER SOURCES AS SOON AS POSSIBLE. THE REQUEST IS TO BE PROCESSED THROUGH THE XCEL ENERGY BUILDERS CALL LINE AT 1-800-628-2121.
- 3. IT IS RECOMMENDED THE CONTRACTOR CALL XCEL ENERGY AT 1-800-895-1999 FOR AN ELECTRIC EMERGENCY.
- 4. IT IS RECOMMENDED THE CONTRACTOR CALL XCEL ENERGY AT 1-800-895-2999 FOR A GAS EMERGENCY.
- 5. CONTRACTOR SHALL LOCATE AND POTHOLE ALL POTENTIAL CONFLICTS WITH EXISTING BURIED UTILITY FACILITIES WITH PROPOSED CONSTRUCTION AS SHOWN IN THE PLANS OR BY FIELD LOCATION MARKINGS. IF CONFLICT EXISTS, MODIFY PROPOSED CONSTRUCTION PLANS TO AVOID ALL EXISTING BURIED UTILITY FACILITIES.
- 6. IT IS ESTIMATED THAT 120 POTHOLES WILL BE REQUIRED ON THE PROJECT AS DIRECTED BY THE ENGINEER.

Known utilities for the Alameda intersections at Clay, Lipan and Platte River Drive are:

UTILITY OWNER	CONTACT/E-MAIL	PHONE/CELL/FAX
XCEL Energy - Electric	Marisa Montoya Local Gov. Project Manager marisa.l.montoya@xcelenergy.com	T: 303-571-3720 C: 303-718-9286 F: 303-571-3102
XCEL Energy - Electric	Michael Wolfe Assigned Design Manager	T: 303-571-3106
XCEL Energy - Gas	Michele McKnight Gas Operations Engineer michelle.t.mcknight@xcelenergy.com	T: 303-571-3358 C: 303-434-7147 F: 303-571-3166
Comcast Cable	Leo Coats Construction Coordinator leo_coats@cable.comcast.com	T: 303-603-5065 C: 720-413-0158
Century Link (Qwest) Alameda Intersections	Andy Devine Senior Design Engineer andy.devine@qwest.com	T: 303-792-6298 C: 720-331-6091
Denver Water	Vince Gaiter vince.gaiter@denverwater.org	T: 303-628-6527
Denver Wastewater	Zhixu Yuan zhixu.yuan@denvergov.org	T: 720-865-3140 F: 720-865-3280
Denver Traffic Traffic Signal Design Coordination	Paul Bountry paul.bountry@denvergov.org	T: 720-913-4840 C: 303-513-6052 F: 720-865-3232
Denver Traffic Operations Traffic Signals and Fiber Optics	Chris Lillie chris.lillie@denvergov.org	T: 720-865-4066 C: 303-880-0386 F: 720-865-4170

Known utilities for the Sheridan intersections at the US-285 ramp intersections are:

UTILITY OWNER	CONTACT/E-MAIL	PHONE/CELL/FAX
XCEL Energy - Electric	Marisa Montoya Local Gov. Project Manager marisa.l.montoya@xcelenergy.com	T: 303-571-3720 C: 303-718-9286 F: 303-571-3102
XCEL Energy - Electric	Sharon Clay Assigned Design Manager	T: 303-571-3159
XCEL Energy - Gas	Michele McKnight Gas Operations Engineer michelle.t.mcknight@xcelenergy.com	T: 303-571-3358 C: 303-434-7147 F: 303-571-3166
Comcast Cable	Bill Howeth Senior Design Engineer bill.howeth@qwest.com	T: 303-451-4644 C: 720-988-0891 F: 303-451-3205
Century Link (Qwest)	Andy Devine Senior Design Engineer andy.devine@qwest.com	T: 303-792-6298 C: 720-331-6091
Denver Water	Vince Gaiter vince.gaiter@denverwater.org	T: 303-628-6527
Denver Wastewater	Zhixu Yuan zhixu.yuan@denvergov.org	T: 720-865-3140 F: 720-865-3280
Denver Traffic Traffic Signal Design Coordination	Paul Bountry paul.bountry@denvergov.org	T: 720-913-4840 C: 303-513-6052 F: 720-865-3232
Denver Traffic Operations Traffic Signals and Fiber Optics	Chris Lillie chris.lillie@denvergov.org	T: 720-865-4066 C: 303-880-0386 F: 720-865-4170

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Unit Information Unit Leader Initials	()		Region 6	Void:	Detailer: KJJ	Numbers		Sheet Number 4
 CENTENNIAL ENGINEERING, INC. 5420 Ward Road, Suite 125 Arvado, CO 80002 (720) 279-7250					Sheet Subset:	Subset Sheets: GN2 OF 4		

Known utilities for the Sheridan intersection at Byron Place/25th Avenue are:

UTILITY OWNER	CONTACT/E-MAIL	PHONE/CELL/FAX
XCEL Energy - Electric	Marisa Montoya Local Gov. Project Manager marisa.l.montoya@xcelenergy.com	T: 303-571-3720 C: 303-718-9286 F: 303-571-3102
XCEL Energy - Electric	Sharon Clay Assigned Design Manager	T: 303-571-3159
XCEL Energy - Gas	Michele McKnight Gas Operations Engineer michelle.t.mcknight@xcelenergy.com	T: 303-571-3358 C: 303-434-7147 F: 303-571-3166
Comcast Cable	Leo Coats Construction Coordinator leo_coats@cable.comcast.com	T: 303-603-5065 C: 720-413-0158
Century Link (Qwest)	Jodie Farnsworth Senior Design Engineer jodie.farnsworth@qwest.com	T: 303-451-2379 C: 303-946-7495 F: 303-451-3205
Denver Water	Vince Gaiter vince.gaiter@denverwater.org	T: 303-628-6527
Denver Wastewater	Zhixu Yuan zhixu.yuan@denvergov.org	T: 720-865-3140 F: 720-865-3280
Denver Traffic Traffic Signal Design Coordination	Paul Bountry paul.bountry@denvergov.org	T: 720-913-4840 C: 303-513-6052 F: 720-865-3232
Denver Traffic Operations Traffic Signals and Fiber Optics	Chris Lillie chris.lillie@denvergov.org	T: 720-865-4066 C: 303-880-0386 F: 720-865-4170

WMD STANDARD NOTES

1. THE WASTEWATER MANAGEMENT DIVISION'S STANDARD DETAILS AND TECHNICAL SPECIFICATIONS FOR SANITARY & STORM SEWERS APPLY TO THIS WORK. THE WASTEWATER DIVISION'S STANDARD DETAILS (DRAWINGS), MOST RECENT EDITION, SHALL BE USED AS A MINIMUM. THIS BOOKLET IS AVAILABLE IN A REDUCED SIZE BOOKLET FORM AND IS AVAILABLE AT THE WMD PERMIT COUNTER DURING NORMAL BUSINESS HOURS. THE TECHNICAL SPECIFICATIONS ARE AVAILABLE FROM THE WMD DESIGN SECTION. BOTH SETS MUST BE IN POSSESSION OF THE CONTRACTOR AT THE PRE-CONSTRUCTION CONFERENCE AND MUST REMAIN ON THE JOB SITE AT ALL TIMES DURING CONSTRUCTION. THE STANDARD DETAILS CAN BE VIEWED AT THE FOLLOWING WEBSITE ADDRESS. DIRECT SITE FOR WMD DETAILS: WWW.DENVERGOV.ORG
2. CONTRACTOR SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL HEALTH AND SAFETY RULES AND REGULATIONS.
3. ONE SET OF THE APPROVED SEWER CONSTRUCTION DRAWINGS MUST BE ON-SITE AT ALL TIMES OF CONSTRUCTION.
4. ALL SEWER PIPES SHALL BE INSTALLED WITH CLASS B BEDDING AS A MINIMUM.
5. ANY MODIFICATIONS, ADJUSTMENTS, CONSTRUCTION OR RECONSTRUCTION OF SEWER FACILITIES MUST BE INSPECTED BY THE PROJECT MANAGER OR HIS REPRESENTATIVE. CONTACT THE PROJECT MANAGER A MINIMUM OF 48 HOURS IN ADVANCE OF THE WORK TO SCHEDULE AN INSPECTOR.
6. PIPE MATERIAL, FITTINGS, TRENCHING, BEDDING, CONNECTIONS, AND SEWER INSTALLATION MUST BE INSPECTED BY THE PROJECT MANAGER PRIOR TO ANY TRENCH BACKFILL. CONTACT PROJECT MANAGER JOHN YU AT 303-865-3176; OR CALL SAM STEVENS AT 303-446-3529 A MINIMUM OF 48 HOURS IN ADVANCE OF THE WORK TO SCHEDULE AN INSPECTOR. MONITORING OF THE PROJECT BY WMD SHALL BE FOR THE PURPOSE OF ASSURING GENERAL COMPLIANCE WITH THE APPROVED PLANS, STANDARDS, DETAILS, AND SPECIFICATIONS AS WELL AS THE RULES & REGULATIONS. WMD INSPECTIONS SHALL NOT TAKE THE PLACE OF CONSTRUCTION INSPECTION AND MATERIALS TESTING, WHICH IS THE LESSEE'S RESPONSIBILITY.
7. ANY QUESTIONS REGARDING WMD FACILITIES THAT ARISE DURING CONSTRUCTION SHOULD BE BROUGHT TO THE ATTENTION OF PROJECT MANAGER JOHN YU AT 303-865-3176; OR SAM STEVENS AT 303-446-3529.
8. THE CONTRACTOR PERFORMING WORK ON ANY PUBLIC OR PRIVATE STORM SEWER FACILITY OR APPURTENANCE MUST BE PROPERLY TRADE LICENSED AS A COMPANY AND HAVE A LICENSED PLUMBER OR CERTIFIED JOURNEYMAN DRAINLAYER ON SITE DURING THE WORK.
9. ACCESS MUST BE MAINTAINED FOR ALL SEWER MANHOLES DURING CONSTRUCTION. ANY DESIGN CHANGES TO NEW OR EXISTING PUBLIC STORM OR SANITARY SEWER MUST INCLUDE PERMANENT ACCESS TO THE PUBLIC STORM AND SANITARY SEWER MANHOLES AND COULD REQUIRE ROLL-OVER CURB, COMMERCIAL DRIVE, REINFORCED CONCRETE SIDEWALK, RITTER RINGS OR CONCRETE PAD. MINIMUM ACCESS TO EACH MANHOLE IS A 20' WIDE LANE FROM THE NEAREST PUBLIC RIGHT-OF-WAY, CENTERED AT THE MANHOLE INCLUDING A 10' RADIUS AROUND THE MANHOLE AND 22.0' VERTICAL CLEARANCE.
10. THE CONNECTION OF A NEW SANITARY/STORM SEWER TO AN EXISTING MANHOLE OR INLET MAY REQUIRE MANHOLE RECONSTRUCTION AT THE DISCRETION OF THE PROJECT MANAGER OR DESIGN ENGINEER.
11. CHANGES IN ELEVATION OR MODIFICATION TO EXISTING INLETS MAY REQUIRE RECONSTRUCTION AT THE DISCRETION OF THE PROJECT MANAGER AND/OR CONSTRUCTION ENGINEER.
12. THE CONTRACTOR SHALL BE AWARE THAT WHEN DEBRIS IS DROPPED INTO MANHOLES AND OTHER STRUCTURES, HE IS TO IMMEDIATELY REMOVE THE DEBRIS TO AVOID THE POSSIBILITY OF PROPERTY DAMAGE DUE TO PLUGGING AND BACKUP ONTO PRIVATE PROPERTIES. IF IT IS DETERMINED THAT CONSTRUCTION DEBRIS HAS RESULTED IN A BACKUP, THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR DAMAGES.
13. THE CONTRACTOR SHALL MAKE SURE THAT ALL MANHOLES AND OTHER STRUCTURES ARE BUILT TO FINISHED GRADE.
14. THE CONTRACTOR SHALL PROVIDE REDLINE PLANS DESCRIBING CHANGES MADE IN THE FIELD TO THE PROJECT MANAGER.
15. AS-BUILT FIELD NOTES, FROM WHICH THE AS-BUILT DRAWINGS ARE PREPARED, ARE TO BE PROVIDED TO THE PROJECT MANAGER AND STAMPED/SIGNED AND DATED BY THE COLORADO REGISTERED PROFESSIONAL LAND SURVEYOR. THESE NOTES WILL INCLUDE THE STATIONING OF ANY BUILDING SEWER STUBS INSTALLED. THE AS-BUILT SURVEY WILL BE COMPLETED BY CITY AND COUNTY OF DENVER.
16. UPON COMPLETION OF SITE GRADING AND SEWER CONSTRUCTION, DIA SHALL BE RESPONSIBLE FOR FURNISHING THE PUBLIC WORK PLANS REVIEW SERVICES, A CERTIFICATE OF INSPECTION PREPARED BY THE COLORADO REGISTERED ENGINEER WHO PERFORMED OR SUPERVISED CONSTRUCTION INSPECTION, CERTIFYING THAT:
 - 1) A CONSTRUCTION INSPECTOR WAS ON THE JOB SITE AT ALL TIMES SEWER OR DRAINAGE FACILITY WORK WAS PERFORMED.
 - 2) ALL STORM AND SANITARY SEWER FACILITIES, SITE GRADING, DETENTION POND GRADING AND OUTLET WORKS (IF ANY) WERE CONSTRUCTED IN COMPLIANCE WITH PLANS AND SPECIFICATIONS APPROVED BY PUBLIC WORKS.
 - 3) THE AS-BUILT DRAWINGS INCLUDED ACCURATELY DEPICT THE FINAL INSTALLATION OF THE STORM DRAINAGE AND/OR SEWER SYSTEM.

NOTE: ALL REQUIREMENTS ON THIS SHEET ARE INCIDENTAL TO THE WORK AND WILL NOT BE PAID FOR SEPARATELY.

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 CENTENNIAL ENGINEERING, INC.		5420 Ward Road, Suite 125 Arvado, CO 80002 (720) 279-7250			 Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6									

STANDARD NOTES FOR PROJECTS WHICH DO NOT REQUIRE A CASDP

THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL ENSURE THAT ALL POTENTIAL POLLUTANTS GENERATED DURING DEMOLITION OR CONSTRUCTION WORK ASSOCIATED WITH THE PROJECT, BE PREVENTED FROM DISCHARGE TO STORMWATER CONVEYANCE SYSTEMS IN THE VICINITY OF THE PROJECT SITE IN ACCORDANCE WITH THE FOLLOWING:

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL PREVENT SEDIMENT, DEBRIS AND ALL OTHER POLLUTANTS FROM ENTERING THE STORM SEWER SYSTEM 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 OTHER PUBLIC OR PRIVATE PROPERTIES, RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
2. 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 ACCUMULATE IN THE FLOW LINES, STORM DRAINAGE APPURTENANCES, AND PUBLIC RIGHTS OF WAY OF THE CITY AND COUNTY OF DENVER AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT. ALL REMOVALS SHALL BE CONDUCTED IN A TIMELY MANNER.
3. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL INSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THIS SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHTS OF WAY. (SEC. 49-552; REVISED MUNICIPAL CODE)
4. THE USE OF REBAR TO ANCHOR BEST MANAGEMENT PRACTICES, OTHER THAN PORTABLE TOILETS, IS PROHIBITED.
5. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL IMPLEMENT THE FOLLOWING BEST MANAGEMENT PRACTICES (BMPS) ON SITE DURING CONSTRUCTION:
 - I. VEHICLE TRACKING CONTROL: THIS BMP IS REQUIRED AT ALL ACCESS POINTS FOR INGRESS/EGRESS FROM OFF-SITE IMPERVIOUS SURFACES TO CONSTRUCTION SITE PERVIOUS AREAS THAT ARE USED BY VEHICULAR TRAFFIC OR CONSTRUCTION EQUIPMENT.
 - II. INLET PROTECTION: THIS BMP IS REQUIRED ON ALL EXISTING OR PROPOSED STORM SEWER INLETS IN THE VICINITY OF THE CONSTRUCTION SITE THAT MAY RECEIVE SITE RUNOFF. THE BMP MUST BE APPROPRIATE TO THE TYPE OF STORM INLET AND APPROPRIATE FOR THE GROUND SURFACE AT THE INLET.
 - III. INTERIM SITE STABILIZATION: THIS BMP IS REQUIRED TO PROVIDE A MEASURE FOR PREVENTING THE DISCHARGE OF SEDIMENT FROM CONSTRUCTION SITES WHERE 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. ACCEPTABLE BMPS INCLUDE:
 - a) PRESERVING EXISTING VEGETATION
 - b) SEEDING AND PLANTING
 - c) MULCHING
 - d) MULCHING AND SEEDING
 - e) TEMPORARY/PERMANENT RE-VEGETATION OPERATIONS
 - f) CHEMICAL SOIL STABILIZER APPLICATION (REQUIRED WMD APPROVAL)
 - IV. WASTE MANAGEMENT/CONTAINMENT: THIS BMP REQUIRES THAT ALL CONSTRUCTION WASTES, FUELS, LUBRICANTS, CHEMICAL WASTES, TRASH, SANITARY WASTES, CONTAMINATED SOILS OR DEBRIS SHALL BE CONTAINED ON SITE, PROTECTED FROM CONTACT WITH PRECIPITATION OR SURFACE RUNOFF, PERIODICALLY REMOVED FROM THE CONSTRUCTION SITE, AND PROPERLY DISPOSED OF.
 - V. SPILL PREVENTION/CONTAINMENT: THIS BMP DEFINES THE MEASURES PROPOSED FOR PREVENTING, CONTROLLING, OR CONTAINING SPILLS OF FUEL, LUBRICANTS, OR OTHER POLLUTANTS; AND PROTECTING POTENTIAL POLLUTANTS FROM CONTACT WITH PRECIPITATION OR RUNOFF.
 - VI. CHUTE WASHOUT CONTAINMENT: WATER USED IN THE CLEANING OF CEMENT TRUCK DELIVERY CHUTES SHALL BE DISCHARGED INTO A PREDEFINED, BERMED CONTAINMENT AREA 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.
 - a) SHOULD A PREDEFINED BERMED CONTAINMENT AREA NOT BE AVAILABLE DUE TO PROJECT SIZE, OR LACK OF AN AREA WITH A SUITABLE GROUND SURFACE FOR ESTABLISHING A CONTAINMENT AREA, PROPER DISPOSAL OF READY MIX WASHOUT AND RINSE OFF WATER AT THE JOB SITE SHALL CONFORM TO THE APPROVED TECHNIQUES AND PRACTICES IDENTIFIED IN THE COLORADO DEPARTMENT OF PUBLIC HEALTH & ENVIRONMENT'S TRAINING VIDEO ENTITLED "BUILDING FOR A CLEANER ENVIRONMENT, READY MIX WASHOUT TRAINING" AND ITS ACCOMPANYING MANUAL ENTITLED, "READY MIX WASHOUT GUIDEBOOK, VEHICLE AND EQUIPMENT WASHOUT AT CONSTRUCTION SITES".
 - b) THE DIRECT OR INDIRECT DISCHARGE OF WATER CONTAINING WASTE CEMENT TO THE STORM SEWER SYSTEM IS PROHIBITED (SEC. 56-102A, C: REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).
 - c) INFORMATION ABOUT, OR COPIES OF THE VIDEO AND TRAINING MANUAL ARE AVAILABLE FROM THE WATER QUALITY CONTROL DIVISION, COLORADO DEPARTMENT OF PUBLIC HEALTH & ENVIRONMENT, 4300 CHERRY CREEK DRIVE SOUTH, DENVER, COLORADO 80222-1530, (303) 692-3555.

STANDARD NOTES FOR PROJECTS WHICH DO NOT REQUIRE A CASDP (CONT.)

- VII. 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 ONTO THEM. EITHER SWEEPING BY HAND OR USE OF STREET SWEEPERS IS ACCEPTABLE. STREET SWEEPERS USING WATER WHILE SWEEPING IS PREFERRED IN ORDER TO MINIMIZE DUST. FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED.
- VIII. PERIMETER CONTROL: THIS BMP REQUIRES THAT A CONSTRUCTION SITE INSTALL A PERIMETER CONTROL MEASURE ALONG THE EDGE OF THE CONSTRUCTION SITE, TO PREVENT, OR FILTER THE DISCHARGE OF SURFACE RUNOFF FROM THE CONSTRUCTION SITE. THE TYPE OF PERIMETER CONTROL USED SHALL BE DETERMINED BASED ON SITE CONDITIONS AND LOCATION. MAINTENANCE AND REPAIR OF THE CONTROL MEASURE SHALL OCCUR AS NEEDED, IN A TIMELY MANNER.
- IX: STOCK PILES: SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE PROTECTED FROM WIND AND WATER EROSION WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. STABILIZATION OF STOCKPILES LOCATED WITHIN 100 FEET OF RECEIVING WATERS, OR WITH SLOPES 3 TO 1 OR GREATER SHALL BE COMPLETED WITHIN SEVEN (7) DAYS FOLLOWING STOCKPILE CONSTRUCTION. STABILIZATION AND PROTECTION OF THE STOCKPILE MAY BE ACCOMPLISHED BY ANY OF THE FOLLOWING: MULCHING, TEMPORARY/PERMANENT REVEGETATION OPERATIONS, CHEMICAL SOIL STABILIZATION APPLICATION (REQUIRES DENVER PUBLIC WORKS APPROVAL), OR EROSION CONTROL MATTING/GEOTEXTILES. IF STOCKPILES ARE LOCATED WITHIN 100 FEET OF RECEIVING WATERS, A DRAINAGEWAY OR THE SITE PERIMETER, ADDITIONAL SEDIMENT CONTROLS SHALL BE REQUIRED.
- X: SAW CUTTING OPERATIONS: THE CONTRACTOR SHALL PROTECT ALL STORM SEWER FACILITIES ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING, OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS OR AS NEEDED THROUGHOUT THE WORK DAY. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE STORM SEWER SYSTEM IS PROHIBITED (SEC. 56-102A, C: REVISED MUNICIPAL CODE, CITY AND COUNTY OF DENVER).
- XI: STRUCTURAL CONTROLS: DEVELOPMENT SITES THAT ARE REQUIRED TO PROVIDE DETENTION AND WATER QUALITY ENHANCEMENT FACILITIES FOR STORM RUNOFF NEED TO INSTALL THE DETENTION FACILITIES EARLY IN THE CONSTRUCTION BUILD-OUT OF THE SITE. PROJECTS THAT ARE USING UNDERGROUND DETENTION ARE REQUIRED TO INSTALL A PRETREATMENT STRUCTURE OR SEDIMENTATION BASINS AS A MEANS OF TREATING POTENTIALLY POLLUTED STREAM WATER PRIOR TO ENTERING THE DETENTION STRUCTURE. USE OF THESE STRUCTURES IS REQUIRED FOR ENTRAPPING SEDIMENT AND CONSTRUCTION DEBRIS DURING THE ACTIVE CONSTRUCTION PHASE OF THE PROJECT. THE NARRATIVE SECTION OF THE MANAGEMENT PLAN IS ALSO REQUIRED TO ADDRESS OPERATION AND MAINTENANCE OF THE STRUCTURAL CONTROLS BEING USED AS AN ACTIVE CONSTRUCTION BMP.
- XII: 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 ORT DEFECT.

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Print Date: 4/24/2012		 DENVER THE MILE HIGH CITY			 Colorado Department of Transportation Region 6 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781		As Constructed		GENERAL NOTES		Project No./Code	
Drawing File Name: geno04.dgn							No Revisions:				SHE R600-391	
Horiz. Scale: 1:1 Vert. Scale: As Noted		<input checked="" type="checkbox"/> R-X <input type="checkbox"/> <input type="checkbox"/>			Revised:		Designer: ACL Detailer: KJJ		18197			
Unit Information Unit Leader Initials					Void:		Sheet Subset: Subset Sheets: GN4 OF 4		Sheet Number 6			
 CENTENNIAL ENGINEERING, INC. 5420 Ward Road, Suite 125 Arvado, CO 80002 (720) 279-7250												

TO ESTABLISH GEOMETRIC CONTROL FOR THE CONSTRUCTION OF THIS PROJECT, THE DEPARTMENT HAS PROVIDED THE FOLLOWING INFORMATION:

- Horizontal Control _____
- Vertical Control _____
- Roadway Alignment _____
- Original Terrain Data _____
- Other: Per Engineer _____

* Specify the information format, i.e., plan sheet, computer disk, computer printout, or other. The information marked is either contained on the plans or is available from the Engineer.

TYPE OF PROJECT

- Landscaping
- Signalization
- Safety Improvement
- Asphalt Overlay
- Concrete Overlay
- Minor Widening
- Major Reconstruction
- New Roadway Construction
- Bridge Replacement
- Bridge Widening
- New Bridge
- Other: _____

SURVEY WORK TO BE PERFORMED BY OTHERS: _____

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 625:

- Establish and Maintain Project Centerline or Engineer Approved Offset Line(s)
- Verification and Maintenance of Horizontal and Vertical Control
- Verify or Determine existing grades and alignments
- Verify or Determine existing topography
- GPS/RTS (Global Positioning System/Robotic Total Station) Construction Machine Control
- Clearing and Grubbing Limits (Section 201)
- Removal Limits (Section 202)
- Reset Items (Section 210)
- Excavation and Embankment (Section 203)

- Excavation
 - Unclassified
 - Stripping
 - Muck
 - Rock
 - Borrow
 - Other: _____
 - Potholing

- Embankment
- Site Grading
- Erosion Control (Perm)
- Other: _____
- As Staked Earthwork Quantities (See General Notes)

- Landscaping
 - Top Soil (Section 207)
 - Seeding (Section 212)
 - Mulching (Section 213)
 - Planting (Section 214)
 - Herbicide (Section 217)
 - Other: _____

- Erosion Control (Section 208)
 - Seeding (Temp)
 - Silt Fence
 - Erosion Bales
 - Erosion Logs
 - Riprap (Temp)
 - Other: _____

- Roadway Bases
 - Untreated Subgrade
 - Treated Subgrade
 - Aggregate Base Course (Section 304)
 - Reconditioning
 - PMBB - Plant Mix Bituminous Base
 - Other: _____

	Slope Staking (Y/N)	Grid (Y/N)	Grade (Y/N)	Special Interval
Excavation	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Y	N	Y	25'
Embankment	-	-	-	-
	-	-	-	-
	-	-	-	-

	Grid (Y/N)	Grade (Y/N)	Special Interval	Special Offset
Roadway Bases	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

- Pavements
 - HMA - Hot Mix Asphalt (Section 403)
 - Concrete (Section 412)
 - Heating & Scarifying Treatment
 - Prime Coat, Tack Coat & Rejuvenating Agent (Section 407)
 - Seal Coat or Chip Seal (Section 409)
 - Other: _____

- Roadway Elements
 - Curb and Gutter (Section 609)
 - Drop inlets - alignment and grades (Section 604)
 - Retaining Walls
 - Guard Rail (Section 606)
 - Sidewalk (Section 608)
 - Overlay Stationing
 - Other: _____

- Riprap (Perm) (Section 506)
- Slope and Ditch Paving (Section 507)

- Minor Structures
 - Structure Excavation limits (Section 206)
 - Culverts (Section 603)
 - Culverts w/ Headwalls and Wingwalls (Section 601)
 - Concrete Box Culverts w/ Headwalls and Wingwalls
 - Pipes (Section 603)
 - Sanitary Sewer
 - Storm Sewer
 - Water
 - Irrigation
 - Miscellaneous
 - Manholes (Section 604)
 - Inlets (Section 604)
 - Other: _____

- Major Structures - Overhead Signs (Section 614), Concrete Box Culverts, Bridges - and all other structures assigned a structure number
 - Structure Excavation limits (Section 206)
 - Concrete Box Culverts (Section 603) w/ Headwalls and Wingwalls (Section 601)
 - Piling locations and cut off elevations (Section 502)
 - Caisson locations and elevations (Section 503)
 - Footing locations, alignment, and elevations
 - Abutment/Pier locations, alignment, and elevations
 - Wingwall skew angles/offsets
 - Structural concrete form locations
 - Substructure As-constructed survey required for Bridges (Subsection 601.12) and Overhead signs (S-614-50)
 - Bridge expansion joint(s) alignment and grade (longitudinal and transverse)
 - Deck grades at Girder 10th or "n" th point locations and elevations
 - Slope and Ditch Paving (Section 507)
 - Other: _____

- Fencing (Section 607)
 - Temporary
 - Permanent
 - Sound Barrier
 - Other: _____

- Delineators (Section 612)
 - Temporary
 - Permanent

- Lighting (Section 613) and Traffic Control Devices (Permanent) (Section 614)
 - Signal pole locations and elevations
 - Light pole locations and elevations
 - Sign locations
 - Field verify sign post locations, elevations, and lengths before fabrication.
 - Other: _____

	Grid (Y/N)	Special Interval	Special Offset
Pavements	N	25'	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	25	25	-
	-	-	-

	Left Interval	Center Interval	Right Interval
Stationing	-	25	-
	-	-	-

- Pavement Marking (Section 627)
 - Striping (Temp)
 - Striping (Perm)
 - Symbols
 - Other: _____
- Temporary Lighting and Construction Traffic Control Devices (Section 630)
 - Signal pole locations and elevations (Temp)
 - Light pole locations and elevations (Temp)
 - Sign Locations (Temp)
 - Other: _____
- All Easements (Temp Staking by P.L.S. Only)
- Right of Way (Temp Staking by P.L.S. Only)

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 629:

- Monumentation (Section 629)
 - Control
 - Right of Way
 - Land corners, Aliquot corners
 - Easements
 - Reference the specified existing monuments: ** _____
 - Replace the specified existing monuments: ** _____
 - Locate monuments. It is estimated _____ hours are required.

NOTE: All 629 items shall include adequate research, calculations, and evaluations of evidence for monuments to be set.

** A Tabulation of Survey Monuments may be provided on the plans.

GENERAL NOTES:

- Unless indicated otherwise on this Survey Tabulation Sheet, all survey work and staking intervals shall be done in accordance with the latest edition of the CDOT Survey Manual.
- Adequate information for establishing lines, grades, and locations for all work items have been specified on the plans. Any additional information required to stake the item or element shall be generated by the Contractor's surveyor.
- The Contractor's surveyor shall provide an estimate of the man-hours necessary to complete the work items indicated on this sheet. A copy of this sheet, with the estimated man-hours written on the blank line to the left of the specified items, shall be submitted with the Survey Schedule to the Engineer 2 days prior to the Presurvey Conference - Construction Survey.
- Stakes and Monuments which are damaged or destroyed by the progress of construction shall be replaced by the Contractor at no additional cost to the Department.
- The Contractor shall furnish an As Staked (or GPS/RTS Construction Machine Control) Earthwork Quantity report to the Engineer prior to completion of twenty percent (20%) of the planned earthwork in any phase as per the CDOT Survey Manual. A printed copy of the As Staked (or GPS/RTS Construction Machine Control) Earthwork data report and a computer disk with that information on it, in the specified format shall be submitted to the Engineer. The Contractor shall field verify original ground cross sections at a maximum 500 feet intervals.
- Prior to beginning work on any subsequent operation, such as placing base course or paving, the Contractor shall certify in writing to the Engineer that the final grade is within specified tolerance.
- The Contractor's surveyor shall perform all field surveying and calculations necessary to tie plan grades into field grades.
- The Contractor shall coordinate construction staking on the project with any utility work.
- Fieldbooks shall contain daily records of points set and or measurements observed. The information recorded shall contain: date, crew members' names, point no., description, staking information, and sketches. If the survey information is collected electronically, information recorded shall be provided to the Project Engineer in a hard copy format that is intuitive, clear and related to the supplemental information recorded in the field books. All linear surveys, such as slope stakes and blue tops, shall have the station and offset information related to the measured information. Non-linear surveys such as structures staking shall have sketches relating electronic information, such as point numbers, to the sketch.
- The Contractor's surveyor shall submit the following fieldbooks to the Engineer:
 - Horizontal Control (Primary & Secondary)
 - Vertical Control (i.e. Benchmarks)
 - Property Pin Ties
 - Horizontal Alignment
 - Grading
 - Slope Staking
 - Minor Structures
 - Major Structures
 - One fieldbook for each work category shown on this sheet
 - Other Fieldbook(s): _____

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Print Date: 4/24/2012		Sheet Revisions		As Constructed	SURVEY TABULATION SHEET	Project No./Code
Drawing File Name: suta.dgn		Date: _____		No Revisions:		SHE R600-391
Horiz. Scale: 1:1	Vert. Scale: As Noted	Comments: _____		Revised:	Designer: KJJ	18197
Unit Information	Unit Leader Initials: _____	Init.: _____		Void:	Detailer: JCM	Sheet Number 10
					Sheet Subset: SURVEY	
5420 Ward Road, Suite 125 Arvado, CO 80002 (720) 279-7250					Subset Sheets: SU1 OF 1	
			Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6			

TABULATION OF REMOVALS AND RESETS

LOCATION	Removal of Inlet		Removal of Pipe		Removal of Concrete Median Cover Material		Removal of Sidewalk		Removal of Curb		Removal of Gutter		Removal of Curb and Gutter		Removal of Concrete Curb Ramp		Removal of Concrete Pavement		Removal of Asphalt Mat		Adjust Manhole		REMARKS	
	202-00019		202-00035		202-00190		202-00200		202-00201		202-00202		202-00203		202-00206		202-00210		202-00220		210-04010			
	EACH		LF		SY		SY		LF		LF		LF		SY		SY		SY		SY			EACH
ALAMEDA AND LIPAN																								
NORTH SIDE							18						38		7						53			
SOUTHWEST CORNER							24		13				42		6						9			
SOUTH EAST CORNER							54						73		6						30			
ALAMEDA AND PLATTE RIVER																								
SOUTHWEST CORNER							44						76		8		24				52			
SB US285 AND SHERIDAN																								
WEST SIDE															14									
EAST SIDE					58		28						65		14						90		1	OWNER: DWMD. STORM MH WORK BY CONTRACTOR
NB US285 AND SHERIDAN																								
NORTHWEST SIDE	1		7		55		32						130		24						13			
NORTHEAST SIDE					4								22		5						4			
SOUTHWEST SIDE							19						32		11						8			
SOUTHEAST SIDE															11									
ALAMEDA AND CLAY																								
NORTH SIDE							20				31		73		13		56				64		1	OWNER: DWMD. SANITARY MH WORK BY
SOUTH SIDE	1						32						88		13						66			
25TH AVE. AND SHERIDAN																								
WEST SIDE															6									INSTALL TRUNCATED DOMES
NORTHEAST SIDE							24						42		3						18			
SOUTHEAST SIDE							31						47		4						11			
PROJECT TOTAL	2		7		148		326		13		31		728		145		80				410		2	

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 Unit Information Unit Leader Initials



Sheet Revisions

Date:	Comments	Init.



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 4670 N. Holly Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

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No Revisions:
 Revised:
 Void:

TABULATION OF REMOVALS AND RESETS

Designer: ACL Structure
 Detailer: KJJ Numbers
 Sheet Subset: Subset Sheets: RMTA1 OF 1

Project No./Code

SHE R600-391
 18197
 Sheet Number 11

TABULATION OF CURB & GUTTER AND MISCELLANEOUS CONCRETE

LOCATION	Concrete Pavement (12 Inch) (Fast Track)		Concrete Sidewalk		Concrete Curb Ramp		Truncated Domes		Curb and Gutter Type 2 (Section I-B)		Curb and Gutter Type 2 (Section II-B)		Gutter Type 2 (10 Foot)		Median Cover Material (4 Inch Patterned Concrete)		REMARKS
	412-01220		608-00000		608-00010		608-00015		609-21010		609-21020		609-24010		610-00024		
	SY		SY		SY		SF		LF		LF		LF		SF		
ALAMEDA AND LIPAN																	
NORTH SIDE	39		20		18						10						
SOUTHWEST CORNER			20		20						45						
SOUTH EAST CORNER	16		38		18						26						
ALAMEDA AND PLATTE RIVER																	
SOUTHWEST CORNER	49		57		27						48						
SB US285 AND SHERIDAN																	
WEST SIDE							70										
EAST SIDE			20		26		14		67		34				771		
NB US285 AND SHERIDAN																	
NORTHWEST SIDE			19		26				7		91				43		
NORTHEAST SIDE							56		13								
SOUTHWEST SIDE			17		21						32						
SOUTHEAST SIDE							56										
ALAMEDA AND CLAY																	
NORTH SIDE	41		70		36						22		32				
SOUTH SIDE	40		30		39						22						
25TH AVE. AND SHERIDAN																	
WEST SIDE							33										
NORTHEAST SIDE			16		17						42						
SOUTHEAST SIDE			31		19						47						
PROJECT TOTAL	185		338		267		229		87		419		32		814		

Print Date: 7/11/2012
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 Horiz. Scale: 1:20 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

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Sheet Revisions

Date:	Comments	Init.



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 No Revisions:
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 Void:

TABULATION OF CURB & GUTTER AND MISCELLANEOUS CONCRETE
 Designer: KJJ Structure
 Detailer: KJJ Numbers
 Sheet Subset: Subset Sheets: CGTA1 OF 1

Project No./Code
 SHE R600-391
 18197
 Sheet Number 12

1. Site Description

A. Project Site Description: This project involves improvements at the following six intersections throughout the Metro area: Alameda and Platte River Drive, Alameda and Lipan, Alameda and Clay, Sheridan and 25th/Byron, and Sheridan and US285 (2 locations). The work consists of removing and replacing curb ramps, damaged curb, gutter, sidewalk and pavement areas as well as traffic signal removal and replacement at all six intersections.

B. Proposed Sequencing For Major Activities: Phase 1 - Removal of traffic signal equipment and curb, gutter, sidewalk and curb ramps. See traffic signal removal sheets for limits of traffic signal removals. See removal and reset plan sheets for limits of removals of roadway features.

Phase 2 - Construction of proposed traffic signals and curb, gutter, sidewalk and curb ramps. See plan sheets for limits of proposed construction.

C. Acres Of Disturbance:

1. Total area of construction site:
 - Alameda and Lipan - 0.07 acres
 - Alameda and Platte River - 0.12 acres
 - SB US285 and Sheridan - 0.10 acres
 - NB US285 and Sheridan - 0.24 acres
 - Alameda and Clay - 0.08 acres
 - 25th/Byron and Sheridan - 0.03 acres
2. Total area of disturbance: 0.64 acres
3. Acreage of seeding: 0 acres

D. Receiving Water:

1. Outfall locations: Various CCD storm sewer systems.
2. Names of receiving water(s) on site and the ultimate receiving water: South Platte River and Bear Creek.

E. Allowable Non-Stormwater Discharges:

No other discharges are anticipated

1. Groundwater and stormwater dewatering shall be used as necessary during construction to protect water quality. Discharges to the ground of water from construction dewatering activities may be authorized provided that the CDPHE low risk discharge guidance policy is followed.
2. If discharges do not meet the above criteria, a separate dewatering permit from the Department of Health will be required. Contaminated groundwater requiring coverage under a separate permit may include groundwater contaminated with pollutants from a landfill, mining activities, industrial pollutant plumes, underground storage tank, etc.

F. Environmental Impacts:

1. Wetland Impacts: None
2. Stream Impacts: None
3. Threatened and Endangered Species: None

2. Site Map Components:

Pre-construction

- A. Construction Site Boundaries See plan sheets.
- B. All Areas Of Ground Surface Disturbance See plan sheets.
- C. Location Of All Structural BMP's Identified In The SWMP See plan sheets.
- D. Springs, Streams, Wetlands And Other Surface Water See plan sheets.
- E. Protection Of Trees, Shrubs, Cultural Resources And Mature Vegetation See plan sheets.
- F. Areas used for storage and stockpiling of materials and staging areas See plan sheets.

3. SWMP Administrator For Design: Centennial Engineering, Inc. - Adria Lucerna, P.E., Project Manager

4. Stormwater Management Controls First Construction Activities

The contractor shall perform the following:

A. Designate A SWMP Administrator/Erosion Control Supervisor (To be filled out at time of construction; designate the individual(s) responsible for implementing, maintaining and revising SWMP, including the title and contact information. The activities and responsibilities of the administrator shall address all aspects of the project's SWMP.)

Name/Title: Contact Information:

B. Potential Pollutant Sources

Evaluate, identify and describe all potential sources of pollutants at the site in accordance with subsection 107.25 and place in the SWMP notebook. All BMP's related to potential pollutants shall be shown on the SWMP site map by the contractor's ECS.

C. Best Management Practices (BMPS) For Stormwater Pollution Prevention

Phased BMP Implementation

During design: Fields are marked when used in the SWMP. During construction: The ECS shall update the checked boxes to match site conditions. Clearly describe the relationship between the phases of construction and the implementation of BMP controls. Add a narrative to the table or to the site map describing why the BMP's are being used in specific locations.

Structural BMP Practices For Erosion And Sediment Control: Practices may include, but are not limited to: Inlet/Outlet Protection - Inlets are to be protected from sediment that may concentrate at them. Storm drain inlet protection shall be placed at existing inlets as shown on the plans, and at new inlets. Inlets and outlet protection shall be installed prior to construction for existing inlets and outlets and immediately after installation for new inlets and outlets. Outlets shall have BMP's placed to collect sediment prior to its being released off the site. Riprap erosion protection shall be placed at pipe outlets to provide permanent protection. Inlet and outlet protection shall be maintained and kept in operating conditions per Section 208.

Concrete Washout Structures - Concrete Washout Structures are to be used as a storage area to collect concrete debris from concrete mixers washing out their chutes and preventing this debris from contaminating waterways. Install prior to any concrete or grouting work. The location shall be approved by the Engineer. Concrete washout structures shall be maintained and kept in operating condition per Section 208.

Gravel Bags - Gravel Bags are to be used in the gutter pans along the flow line and upstream of storm drain inlets to capture sediment-laden water or other pollutants from saw cutting, metal grinding, or other work. Gravel bags shall be installed prior to work commencing and shall be removed once work at the site is complete. Gravel bags shall be maintained and kept in operating condition per Section 208. See also the project special provisions for Storm Drain Inlet Protection and Clean Culvert (Special).

BMP	Type of Control	BMP As Designed	In Use On Site	First Construction Activities	During Construction	Interim/Final Stabilization
Gravel Bags	Sediment	X			X	
Concrete Washouts	Construction				X	

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Sheet Revisions																						
Date:	Comments	Init.																				

Non-Structural BMP Practices For Erosion And Sediment Control: Practices may include, but are not limited to:

Preservation of Trees and Mature Vegetation - Prior to construction commencing, orange plastic fence (Fence (Plastic) shall be placed in combination with an Erosion Log to prevent encroachment of construction traffic and sediment into state waters. Fence (Plastic) shall be placed adjacent to the wetlands, mature trees and vegetation; Erosion Logs shall be placed between the Fence (Plastic) and disturbance area. Erosion Logs shall be placed to direct flows away from or filter water running into wetlands, mature trees and vegetation from disturbance areas. Erosion Logs at these locations shall be trenched into the soil. Sediment in vegetative ditches shall be avoided to prevent sediment laden water from exiting the project site. All vegetative ditch outfalls (from CDOT right of way) shall be protected with Erosion Logs as shown in the plans or as directed.

Street Sweeping - Paved surfaces adjacent to the Construction site shall be swept by the close of the business day and during the day as needed when sediment and other materials are tracked or discharged onto them. Sweeping shall be completed with a pickup broom or equipment capable of collecting sediment. Sweeping with a kickbroom will not be allowed. Street sweepers using water while sweeping are preferred in order to minimize dust. Flushing off paved surfaces using water is prohibited. See also the project special provision for sweeping.

Clean Culvert (Special) - Prior to beginning any work other than traffic control, debris and dirt in all existing inlets, culverts and storm drains within project limits shall be dislodged and removed to the greatest extent possible. Cleaning shall be done by Vactor removal method. If construction-related sediment or debris has accumulated in the inlet, culvert or storm drain after dispose of sediment. See also the project special provision for Clean Culvert (Special).

BMP	Type Of Control	BMP As Designed	In Use On Site	First Construction Activities	During Construction	Interim/Final Stabilization
Protection of Trees	Erosion	X			X	
Preservation of Mature Vegetation	Erosion				X	
Street Sweeping	Sediment	X			X	
Clean Culvert (Special)	Sediment			X	X	

- Erosion control devices are used to limit the amount of erosion on site.
- Sediment control devices are designed to capture sediment on the project site.
- Construction control are BMP's related to construction access and staging.
- BMP locations are indicated on the site map.
- BMP installation details and general narratives are in the SWMP notebook.

D. Offsite Drainage (Run On Water)

1. Describe and record BMP's on the SWMP site map that have been implemented to address run-on water in accordance with subsection 208.03.

E. Stabilized Construction Entrance/Vehicle Tracking Control

1. BMP's shall be implemented in accordance with subsection 208.04.

F. Perimeter Control

1. Perimeter control shall be established as the first item on the SWMP to prevent the potential for pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters.
2. Perimeter control may consist of vegetation buffers, berms, silt fence, erosion logs existing landforms, or other BMP's as approved.
3. Perimeter control shall be in accordance with subsection 208.04.

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Unit Information	Unit Leader Initials					Void:	Detailer: KJJ	Sheet Subset:	Subset Sheets: SWMP2 of 3	Sheet Number 15	
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5. During Construction

Responsibilities Of The SWMP Administrator/Erosion Control Supervisor During Construction

During construction, indicate how items not addressed during design are being handled. If items are covered in the template or other section of the SWMP notebook, indicate below in what section the discussion takes place.

The SWMP should be considered a "Living Document" that is continuously reviewed and modified. During construction, the following items shall be added, updated, or amended as needed by the SWMP Administrator/Erosion Control Supervisor (ECS) in accordance with section 208.

A. Materials Handling And Spill Prevention

1. Prior to construction commencing the Contractor shall submit a Spill Prevention, Control and Countermeasure Plan, see subsection 208.06. Materials handling shall be in accordance with subsection 208.06.

B. Stockpile Management

1. Shall be done in accordance with subsection 107.25 and 208.07.

C. Concrete Washout

1. Concrete wash out water or waste from field laboratories and paving equipment shall be contained in accordance with subsection 208.05.

D. Saw Cutting

1. Shall be done in accordance with subsection 107.25, 208.04 and 208.05.

E. Street Cleaning

1. Shall be done in accordance with subsection 208.04.

6. Inspections

A. Inspections shall be in accordance with subsection 208.03 (c).

7. BMP Maintenance

A. Maintenance shall be in accordance with subsection 208.04 (f).

8. Record Keeping

A. Records shall be kept in accordance with subsection 208.03 (c).

9. Interim And Final Stabilization

A. Seeding Plan

Soil preparation, soil conditioning or topsoil, seeding (native), mulching (weed free), and mulch tackifier are not expected to be used. If needed, the Region 6 landscape Architect shall be contacted for types, rates and application requirements. Stabilization shall not be paid for separately but shall be included in the work.

B. Reseeding Operations/Corrective Stabilization

Prior to final acceptance.

1. The Contractor shall maintain seeding/mulch/tackifier, mow to control weeds or apply herbicide to control weeds in the seeded areas Final Acceptance.

10. Prior To Final Acceptance

A. Final Acceptance shall be in accordance with subsection 208.10.

11. Tabulation Of Stormwater Quantities

Pay Item	Description	Unit	Quantity
202	Clean Culvert (Special)	Each	12
208	Concrete Washout Structure	Each	6
Force Account:			
203	Sweeping (Pick-up Broom)	Hour	80 ●
208	Sediment Removal and Disposal (Labor)	Hour	40 ●
208	Gravel Bag	Lin. Ft.	100 ●
208	Erosion Control Supervisor	Hour	40 ●

● Quantities shown for information only. These items will be paid under the project Force Account for Erosion Control.

1. BMP Maintenance shall be included in the cost of the BMP except for removal of sediment from the BMP's, which shall be paid for as 208 Sediment Removal and Disposal (Labor).

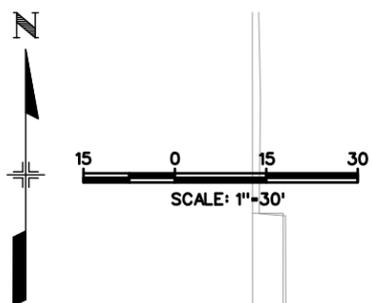
2. It is estimated that 6 concrete washout structures (one per site) will be required.

3. It is estimated that 0 stabilized construction entrance(s) will be required as directed to minimize vehicle tracking control. Locate BMP on the SWMP site map.

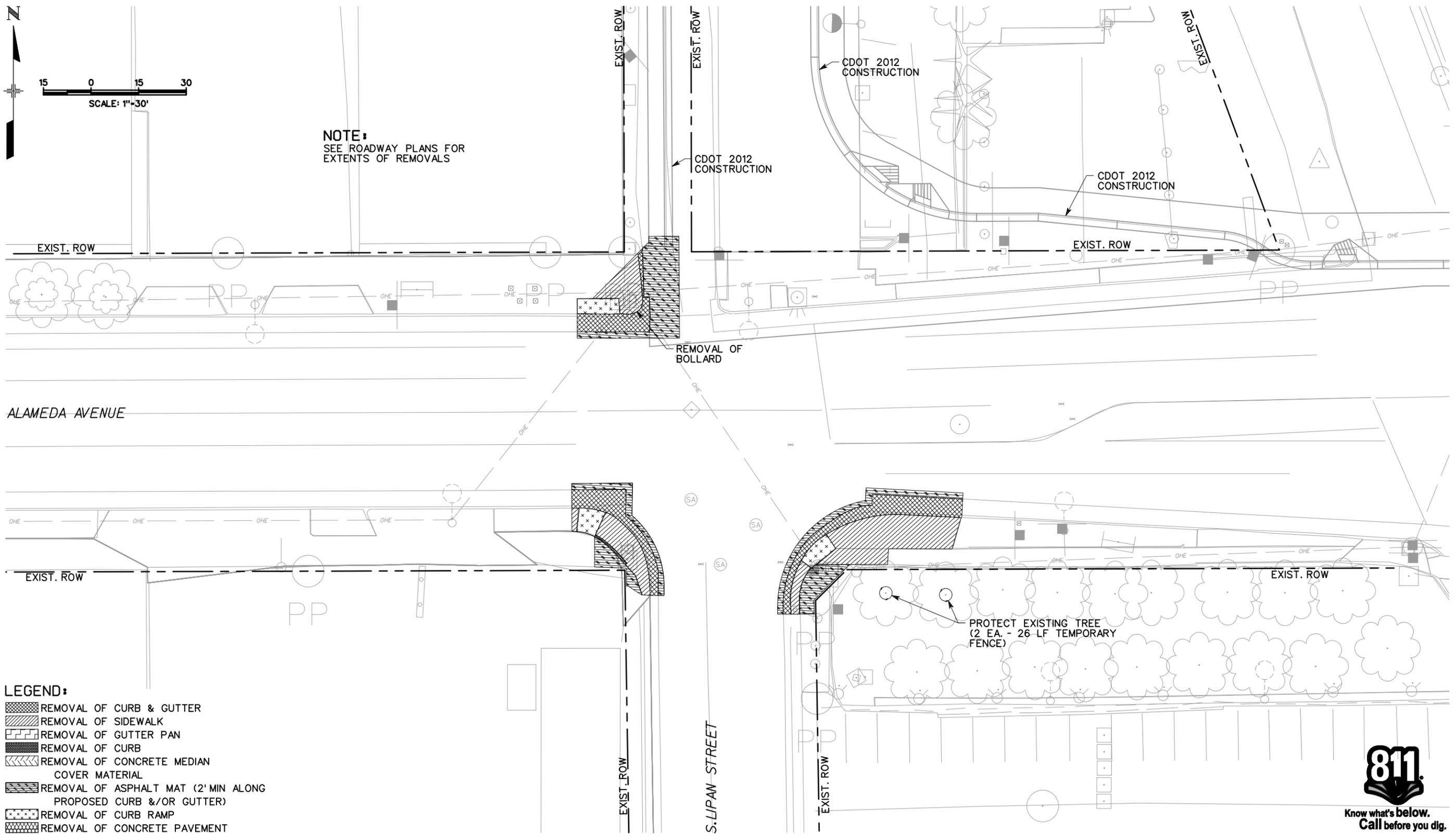
4. Landscape restoration, water, seeding, fertilizing, sodding and maintenance of restored areas shall not be paid for separately but shall be included in the project Force Account for Landscaping.

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NOTE:
SEE ROADWAY PLANS FOR
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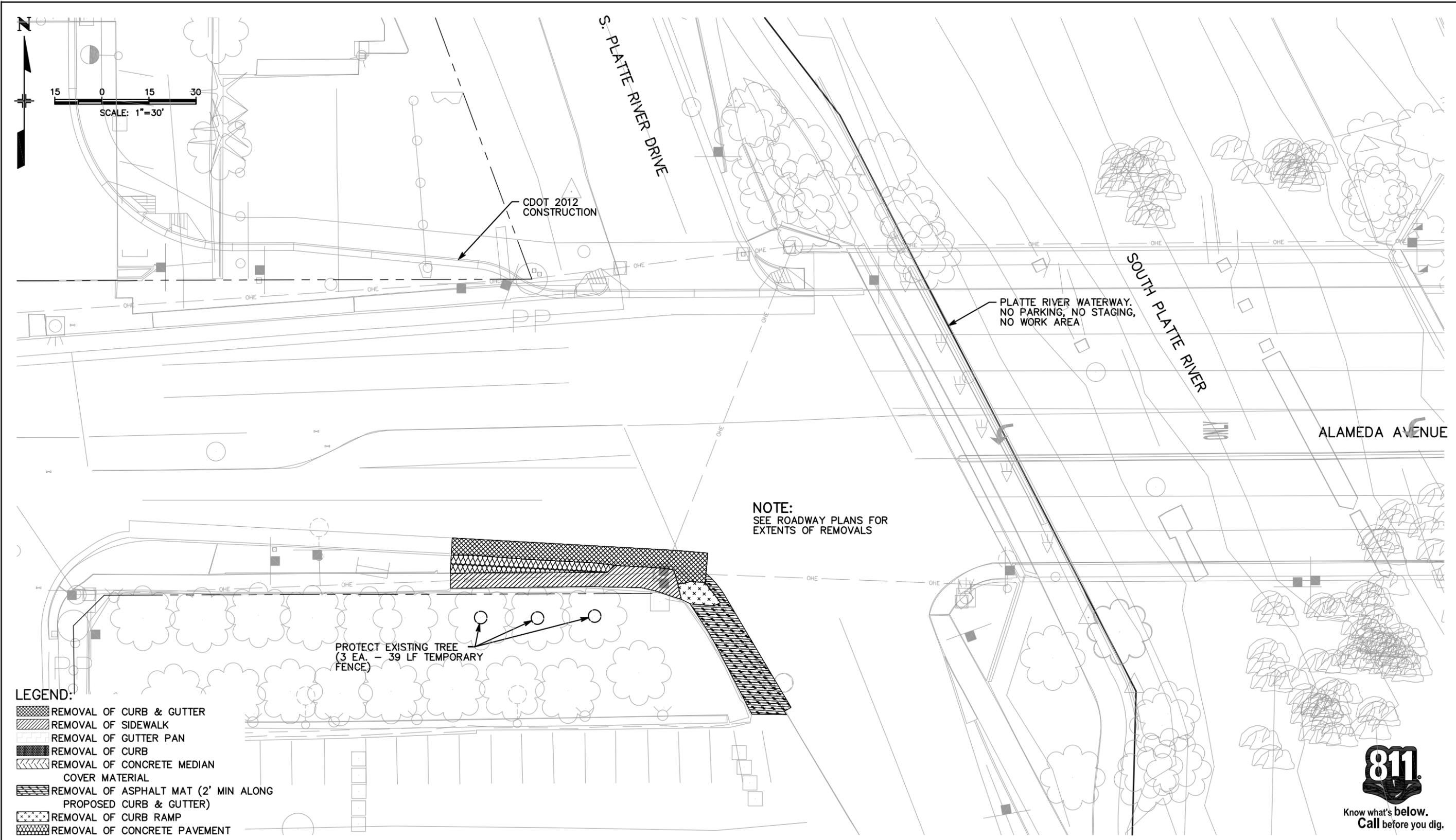


- LEGEND:**
- REMOVAL OF CURB & GUTTER
 - REMOVAL OF SIDEWALK
 - REMOVAL OF GUTTER PAN
 - REMOVAL OF CURB
 - REMOVAL OF CONCRETE MEDIAN COVER MATERIAL
 - REMOVAL OF ASPHALT MAT (2' MIN ALONG PROPOSED CURB &/OR GUTTER)
 - REMOVAL OF CURB RAMP
 - REMOVAL OF CONCRETE PAVEMENT



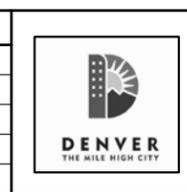
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Unit Information Unit Leader Initials					Void:			Detailer:	KJJ	Subset Sheets:	RM1 OF 6	
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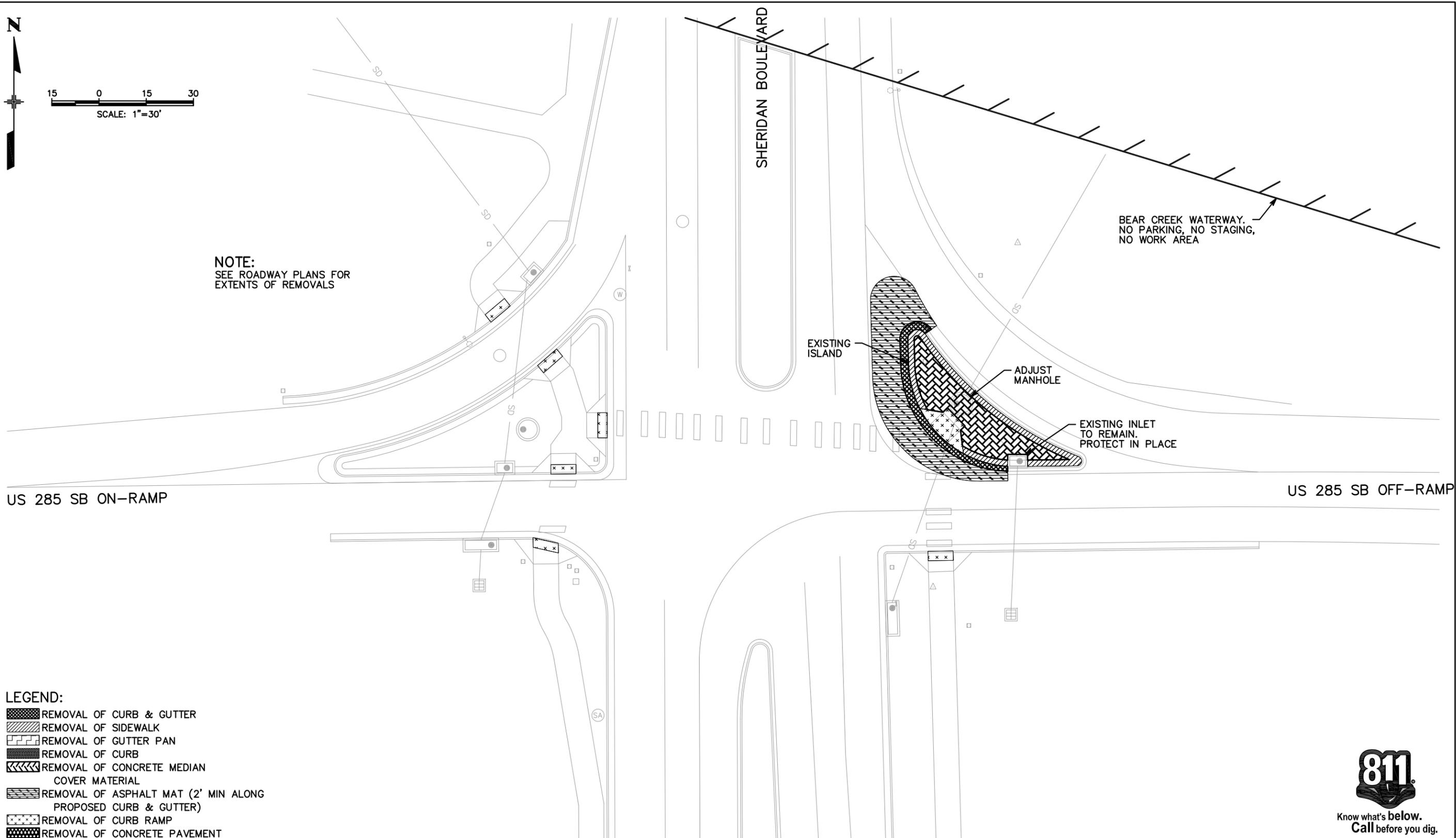
ALAMEDA AVENUE & PLATTE RIVER DRIVE REMOVAL AND RESET PLAN

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 Sheet Number 18



NOTE:
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LEGEND:

- REMOVAL OF CURB & GUTTER
- REMOVAL OF SIDEWALK
- REMOVAL OF GUTTER PAN
- REMOVAL OF CURB
- REMOVAL OF CONCRETE MEDIAN
COVER MATERIAL
- REMOVAL OF ASPHALT MAT (2' MIN ALONG
PROPOSED CURB & GUTTER)
- REMOVAL OF CURB RAMP
- REMOVAL OF CONCRETE PAVEMENT



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REMOVAL AND RESET PLAN**

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Detailer: KJJ

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Structure

Numbers

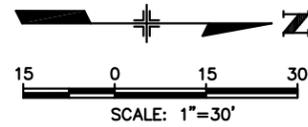
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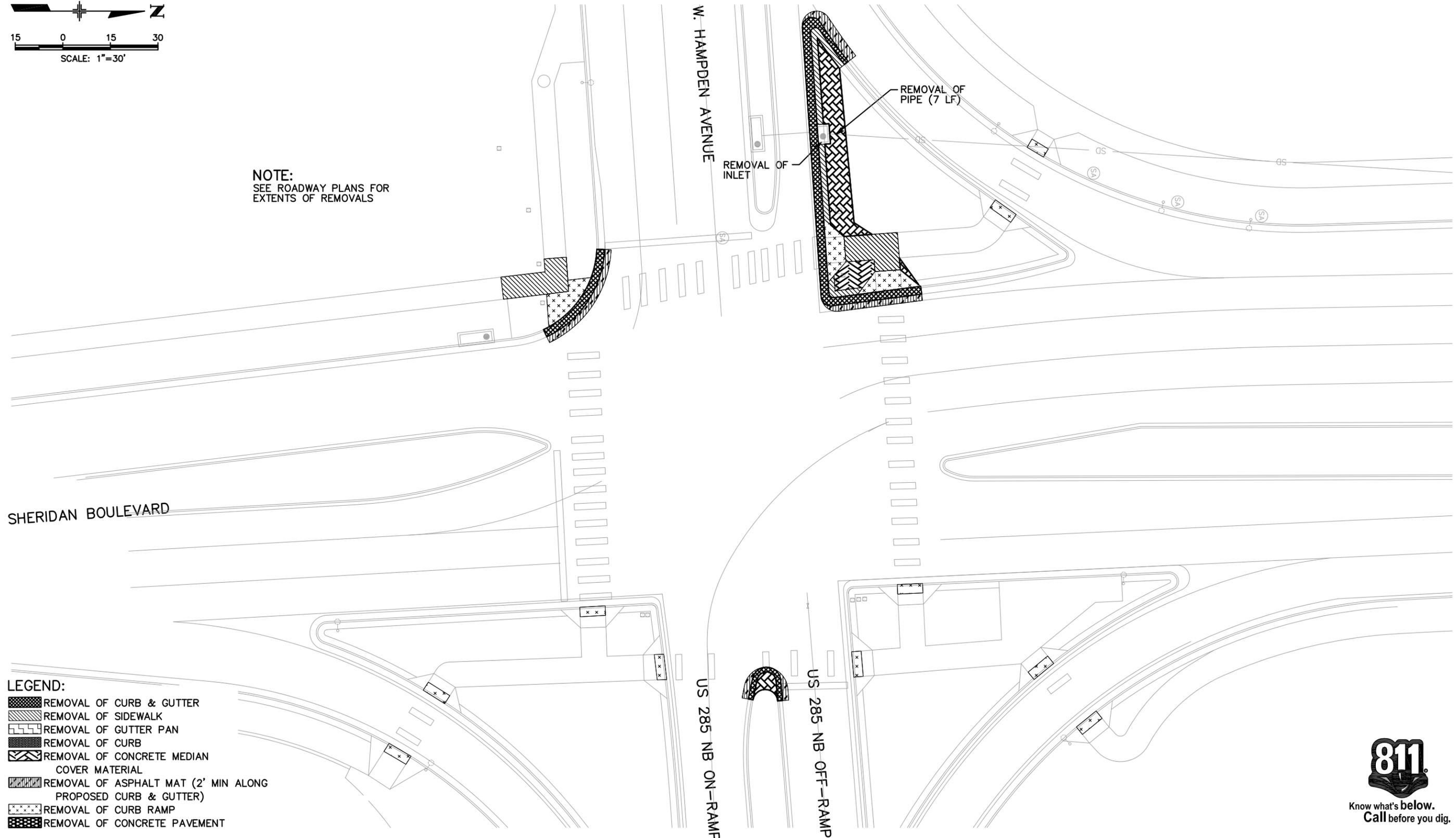
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- REMOVAL OF GUTTER PAN
- REMOVAL OF CURB
- REMOVAL OF CONCRETE MEDIAN
- COVER MATERIAL
- REMOVAL OF ASPHALT MAT (2' MIN ALONG PROPOSED CURB & GUTTER)
- REMOVAL OF CURB RAMP
- REMOVAL OF CONCRETE PAVEMENT



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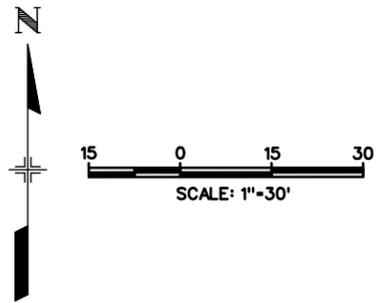
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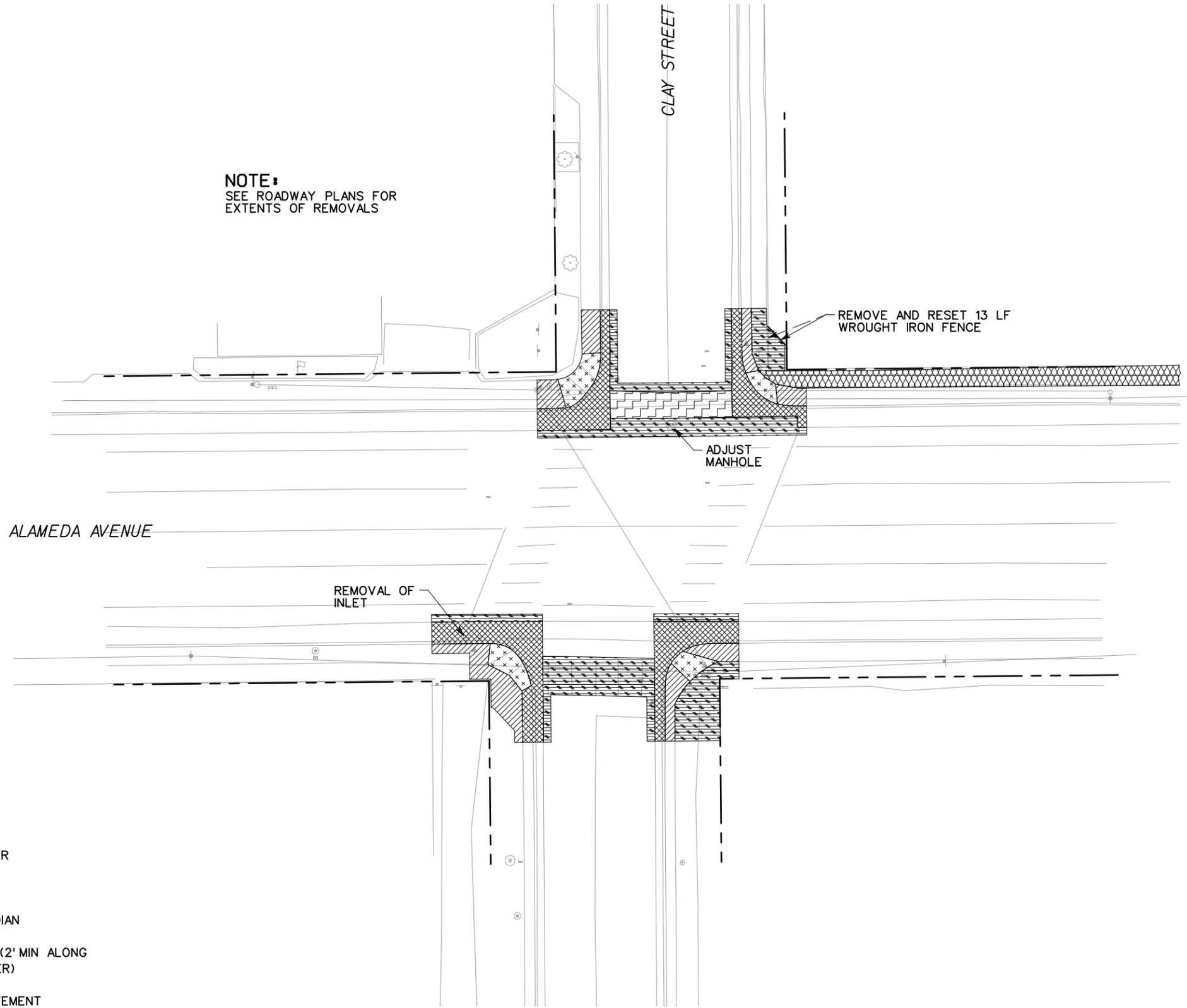


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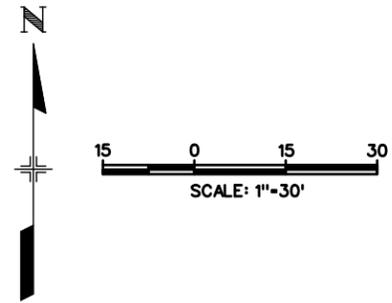
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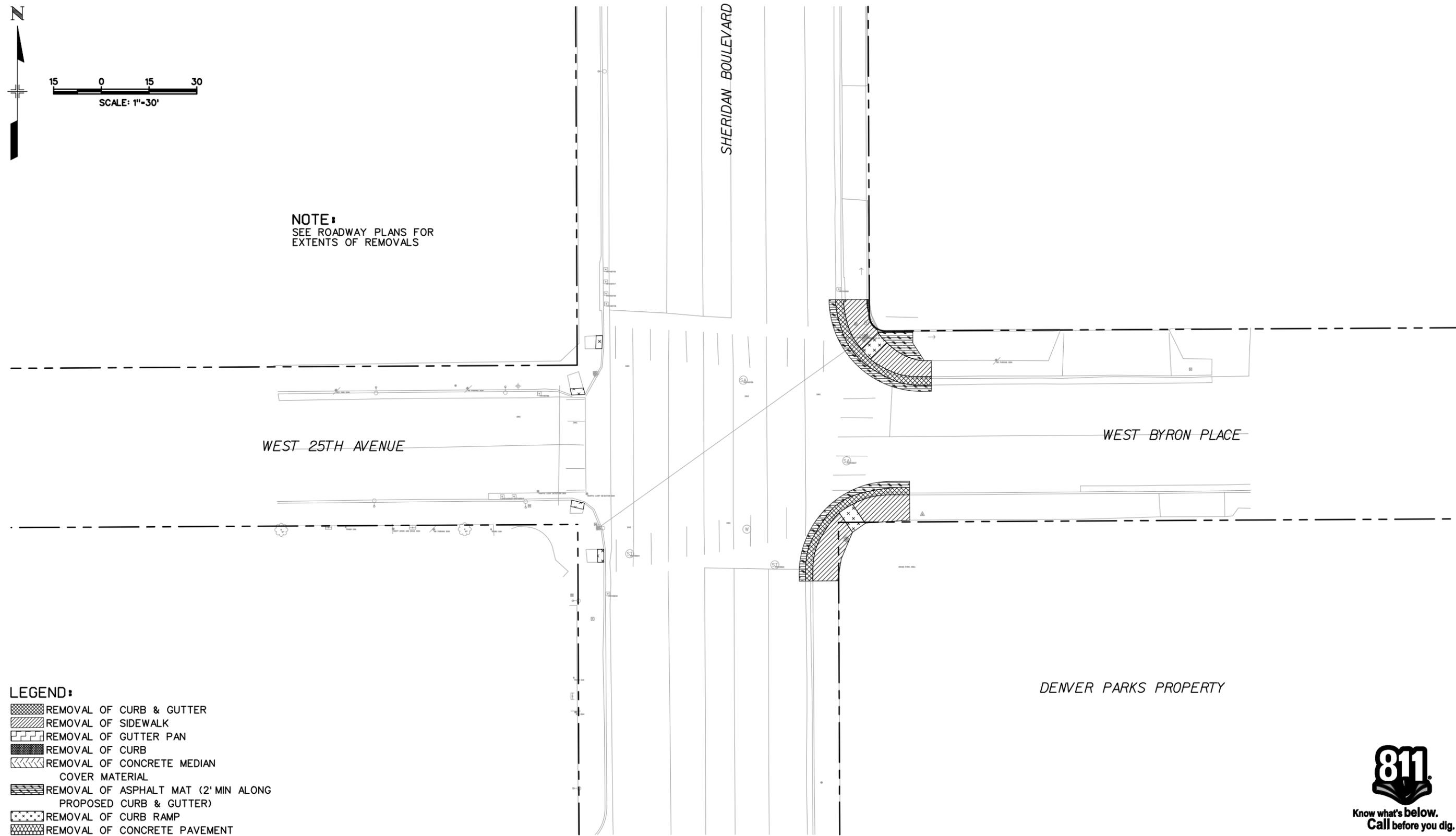


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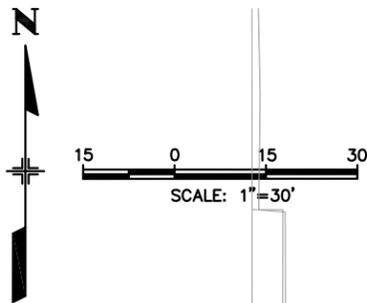
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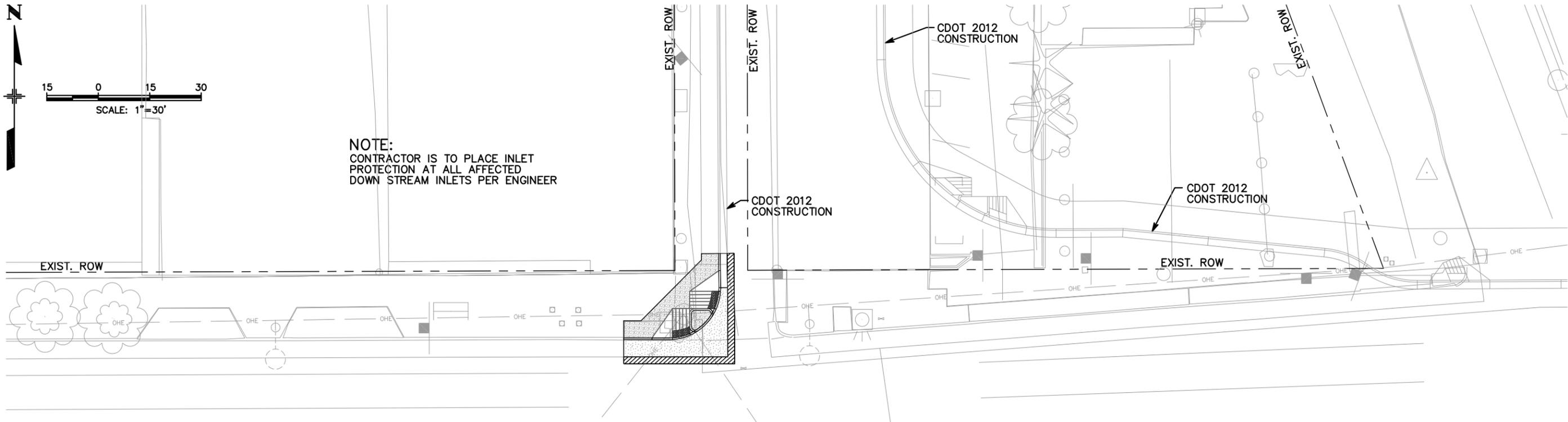


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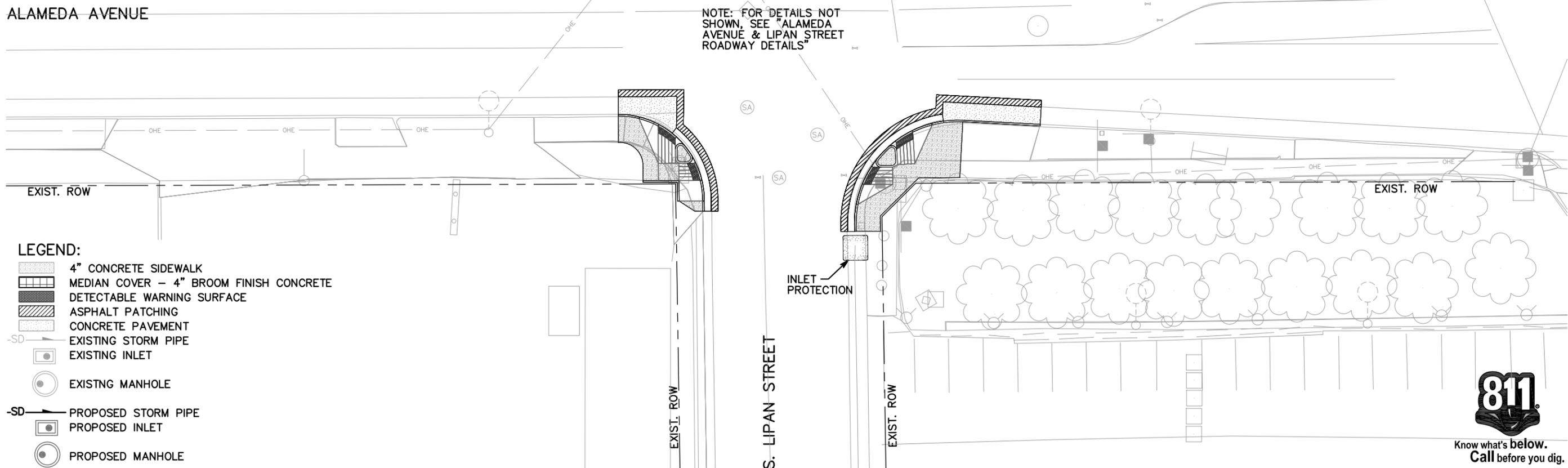


NOTE:
CONTRACTOR IS TO PLACE INLET PROTECTION AT ALL AFFECTED DOWN STREAM INLETS PER ENGINEER



ALAMEDA AVENUE

NOTE: FOR DETAILS NOT SHOWN, SEE "ALAMEDA AVENUE & LIPAN STREET ROADWAY DETAILS"



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT
- EXISTING STORM PIPE
- EXISTING INLET
- EXISTING MANHOLE
- PROPOSED STORM PIPE
- PROPOSED INLET
- PROPOSED MANHOLE



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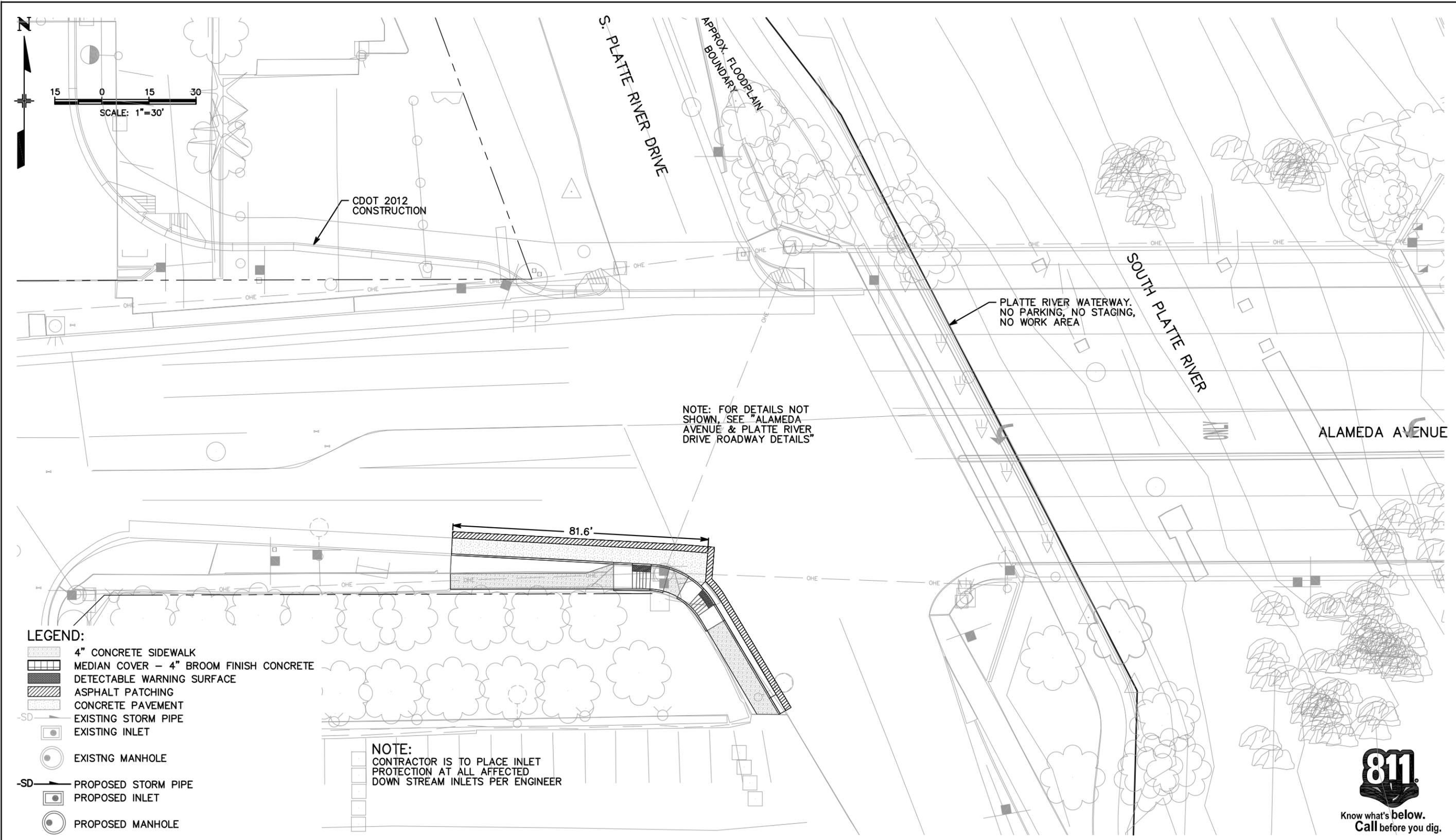


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ALAMEDA AVENUE & LIPAN STREET ROADWAY PLAN			
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ALAMEDA AVENUE & PLATTE RIVER DRIVE ROADWAY PLAN

Designer:	KJJ	Structure	
Detailer:	KJJ	Numbers	
Sheet Subset:		Subset Sheets:	RD2 OF 6

Project No./Code
 SHE R600-391
 18197
 Sheet Number 24





NOTE:
CONTRACTOR IS TO PLACE INLET
PROTECTION AT ALL AFFECTED
DOWN STREAM INLETS PER ENGINEER

SB285 REQ'D INLET TYPE R
L=5 (H=10')
PLACE IN PROPOSED ISLAND IN LINE AND
AT SAME INVERT AS EXISTING 24" RCP.
EXTEND EXISTING 24" RCP UNTIL IT IS
FLUSH WITH INSIDE WALL. FORM AROUND
EXISTING OUTLET PIPE AND REMOVE
REQUIRED LENGTH OF OUTLET PIPE TO
BE FLUSH WITH INSIDE WALL OF INLET.

BEAR CREEK WATERWAY.
NO PARKING, NO STAGING,
NO WORK AREA

SHERIDAN BOULEVARD

APPROX. FLOODPLAIN
BOUNDARY

EXISTING
ISLAND

SB285

INLET
PROTECTION

REQ'D 24" RCP
EXTENTION

US 285 SB OFF-RAMP

US 285 SB ON-RAMP

NOTE: FOR DETAILS NOT
SHOWN, SEE "SB US 285
& SHERIDAN BOULEVARD
ROADWAY DETAILS"

LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT
- EXISTING STORM PIPE
- EXISTING INLET
- EXISTING MANHOLE
- PROPOSED STORM PIPE
- PROPOSED INLET
- PROPOSED MANHOLE



Print Date: 7/11/2012
 Drawing File Name: rdma03_SB 285.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

CENTENNIAL
ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.



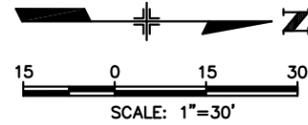
Colorado Department of Transportation
 Region 6
 4670 N. Holly
 Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781

As Constructed
 No Revisions:
 Revised:
 Void:

SB US 285 & SHERIDAN
 BOULEVARD ROADWAY PLAN

Designer:	KJJ	Structure	
Detailer:	KJJ	Numbers	
Sheet Subset:		Subset Sheets:	RD3 OF 6

Project No./Code
 SHE R600-391
 18197
 Sheet Number 25



NOTE:
CONTRACTOR IS TO PLACE INLET PROTECTION AT ALL AFFECTED DOWN STREAM INLETS PER ENGINEER

NOTE: FOR DETAILS NOT SHOWN, SEE "NB US 285 & SHERIDAN BOULEVARD ROADWAY DETAILS"

NB285A REQ'D INLET TYPE R
L=5 (H=10')
PLACE IN RELOCATED ISLAND CURB IN LINE AND AT SAME INVERT AS EXISTING 48" RCP. EXTEND EXISTING 48" RCP UNTIL IT IS FLUSH WITH INSIDE WALL. FORM AROUND EXISTING OUTLET PIPE AND REMOVE REQUIRED LENGTH OF OUTLET PIPE TO BE FLUSH WITH INSIDE WALL OF INLET.

SHERIDAN BOULEVARD

W. HAMPDEN AVENUE

US 285 NB ON-RAMP

US 285 NB OFF-RAMP

LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT
- EXISTING STORM PIPE
- EXISTING INLET
- EXISTNG MANHOLE
- PROPOSED STORM PIPE
- PROPOSED INLET
- PROPOSED MANHOLE

Print Date: 7/11/2012
 Drawing File Name: rdma04_NB 285.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

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Date:	Comments	Init.



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No Revisions:
Revised:
Void:

NB US 285 & SHERIDAN BOULEVARD ROADWAY PLAN		
Designer:	KJJ	Structure
Detailer:	KJJ	Numbers
Sheet Subset:	Subset Sheets: RD4 OF 6	

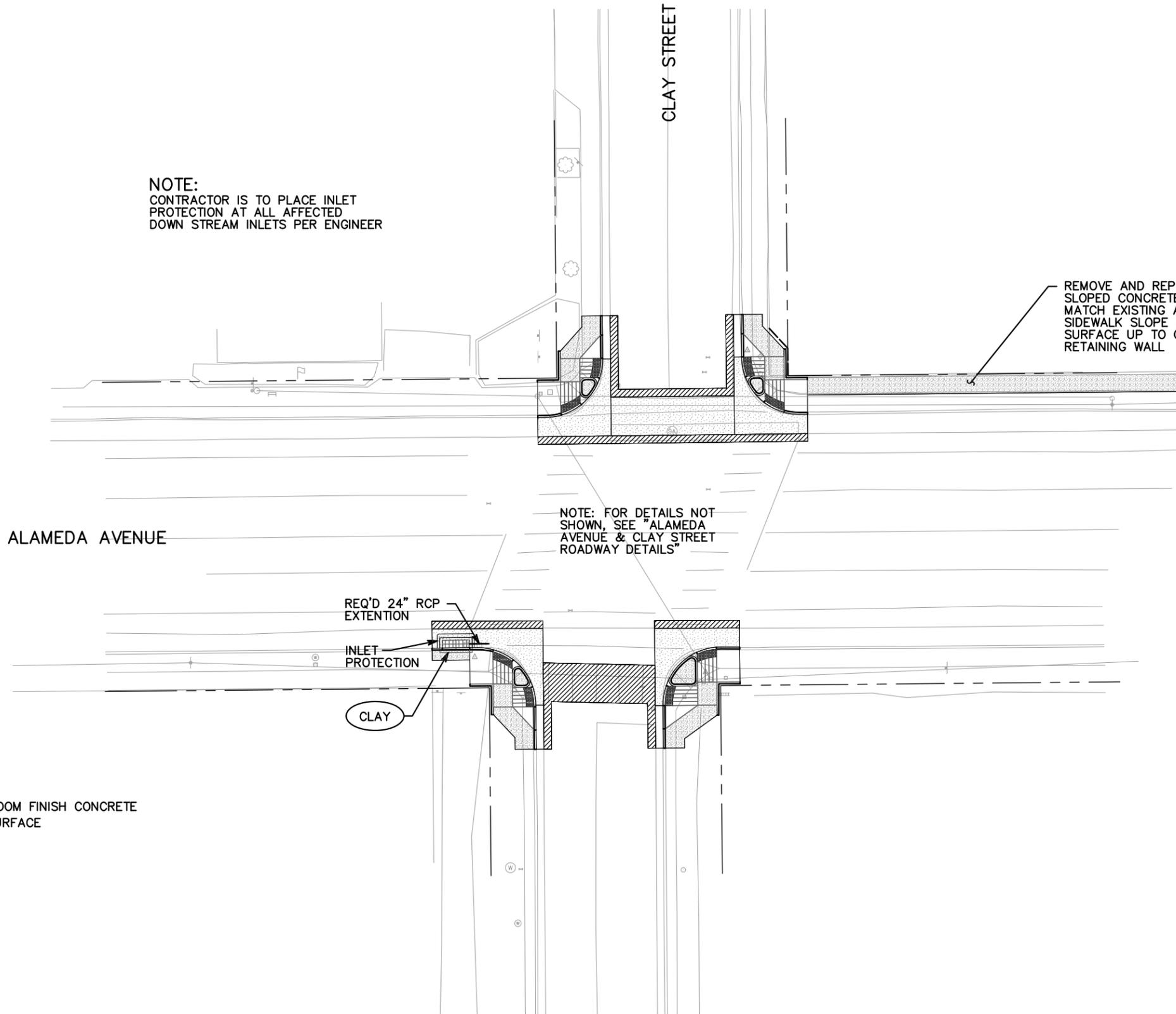
Project No./Code
SHE R600-391
18197
Sheet Number 26





NOTE:
CONTRACTOR IS TO PLACE INLET
PROTECTION AT ALL AFFECTED
DOWN STREAM INLETS PER ENGINEER

CLAY REQ'D INLET TYPE 16
DOUBLE (H=5')
MATCH EXISTING CURB IN LINE AND
AT SAME INVERT AS EXISTING STORM
SEWER PIPE. EXTEND EXISTING STORM
SEWER PIPE UNTIL IT IS FLUSH WITH
INSIDE WALL. FORM AROUND EXISTING
INLET PIPE AND REMOVE REQUIRED
LENGTH OF INLET PIPE TO BE FLUSH
WITH INSIDE WALL OF INLET.



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT
- EXISTING STORM PIPE
- EXISTING INLET
- EXISTING MANHOLE
- PROPOSED STORM PIPE
- PROPOSED INLET
- PROPOSED MANHOLE



Know what's below.
Call before you dig.

Print Date: 7/11/2012
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 Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.



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 Region 6

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 No Revisions:
 Revised:
 Void:

ALAMEDA AVENUE & CLAY
 STREET ROADWAY PLAN

Designer:	KJJ	Structure	
Detailer:	KJJ	Numbers	
Sheet Subset:		Subset Sheets:	RD5 OF 6

Project No./Code
 SHE R600-391
 18197
 Sheet Number 27





NOTE:
CONTRACTOR IS TO PLACE INLET PROTECTION AT ALL AFFECTED DOWN STREAM INLETS PER ENGINEER

SHERIDAN BOULEVARD

INLET PROTECTION

INLET PROTECTION

WEST 25TH AVENUE

NOTE: FOR DETAILS NOT SHOWN, SEE "SHERIDAN BOULEVARD & 25TH AVENUE ROADWAY DETAILS"

WEST BYRON PLACE

LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT
- EXISTING STORM PIPE
- EXISTING INLET
- EXISTING MANHOLE
- PROPOSED STORM PIPE
- PROPOSED INLET
- PROPOSED MANHOLE



Know what's below.
Call before you dig.

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 Horiz. Scale: 1:30 Vert. Scale: As Noted
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Sheet Revisions		
Date:	Comments	Init.



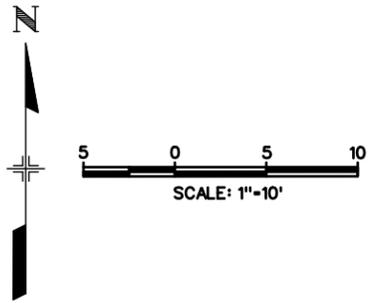
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 Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781

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 No Revisions:
 Revised:
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SHERIDAN BOULEVARD & 25TH AVENUE ROADWAY PLAN			
Designer:	KJJ	Structure	
Detailer:	KJJ	Numbers	
Sheet Subset:		Subset Sheets:	RD6 OF 6

Project No./Code
 SHE R600-391
 18197
 Sheet Number 28





- NOTES:**
1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADI ESTABLISHED BY THE ENGINEER
 2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
 3. DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
 4. NEW CONCRETE JOINTS ARE TO MATCH ANY ADJACENT EXISTING CONCRETE JOINTS
 5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

③ CURB RAMP TYPE 3 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.3)

ASSUMED CDOT 2012 CONSTRUCTION LIMITS. AT THE TIME OF THIS PLAN PACKAGE FUTURE CDOT CONSTRUCTION WAS STILL IN THE DESIGN PHASE. CONTRACTOR TO CONFIRM FUTURE CDOT CONSTRUCTION LIMITS WITH THE ENGINEER BEFORE BEGINNING CONSTRUCTION

END SIDEWALK AND CURB & GUTTER TYPE 2 (SECTION IIB) (MATCH EXISTING ROADWAY SURFACING)

BEGIN SIDEWALK AND CONCRETE PAVEMENT (MATCH EXISTING)

15' RADIUS POINT

8.2'

5'

10.0'

END CONCRETE PAVEMENT

EXIST. ROW

EXIST. ROW

EXIST. ROW

EXIST. ROW

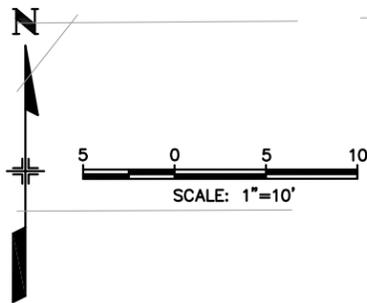
LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

ALAMEDA AVENUE

k.jensen 9:12:10 AM W:\08115012-ccd_intersections_Roadway\Plan\Rddt01A_Lipan.dgn

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Revised:		Designer: KJJ	Structure Numbers	18197																																															
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Drawing File Name: rddt01A_Lipan.dgn		DENVER THE MILE HIGH CITY		Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6																																															
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Unit Information		Unit Leader Initials																																																	

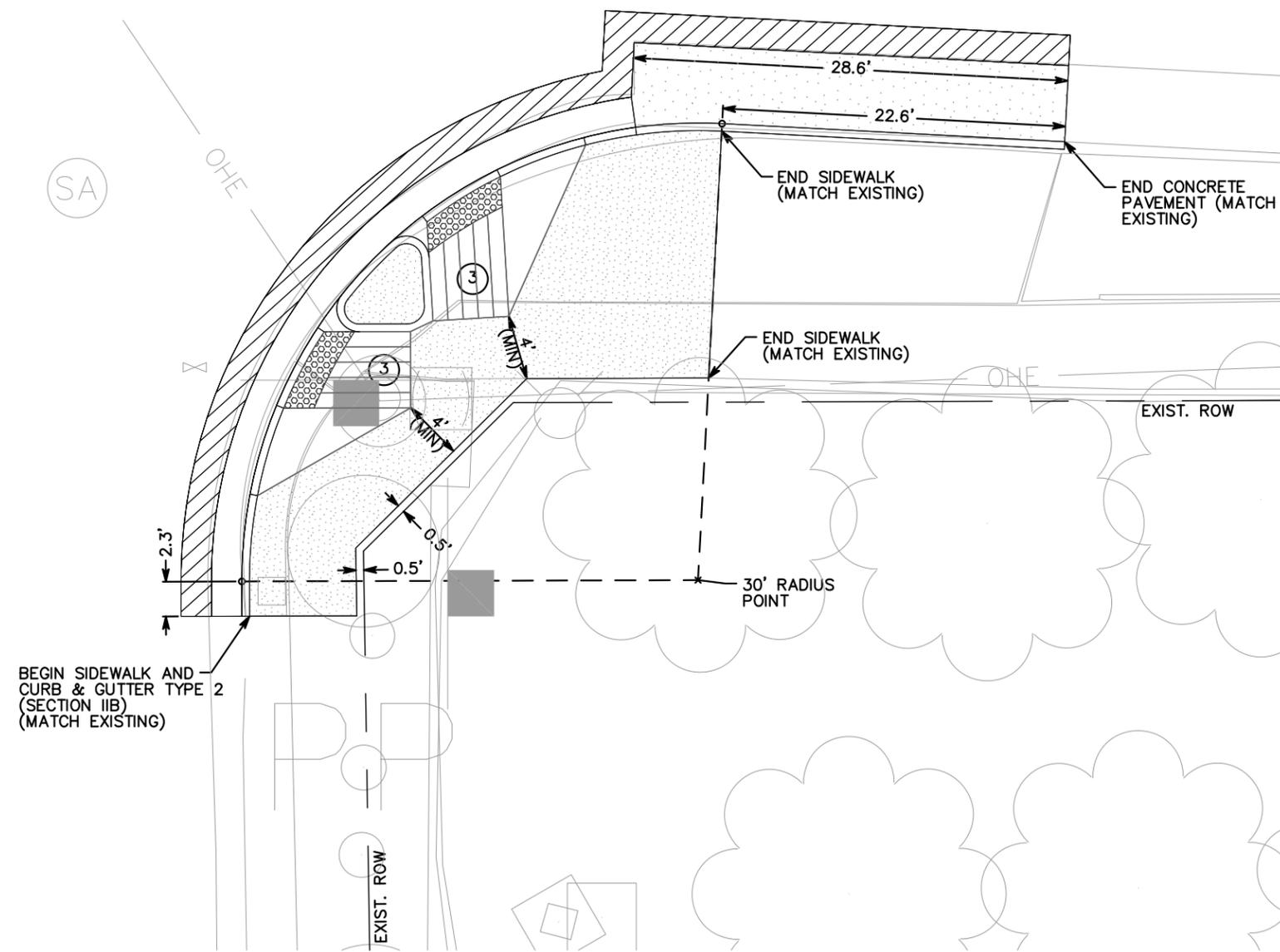
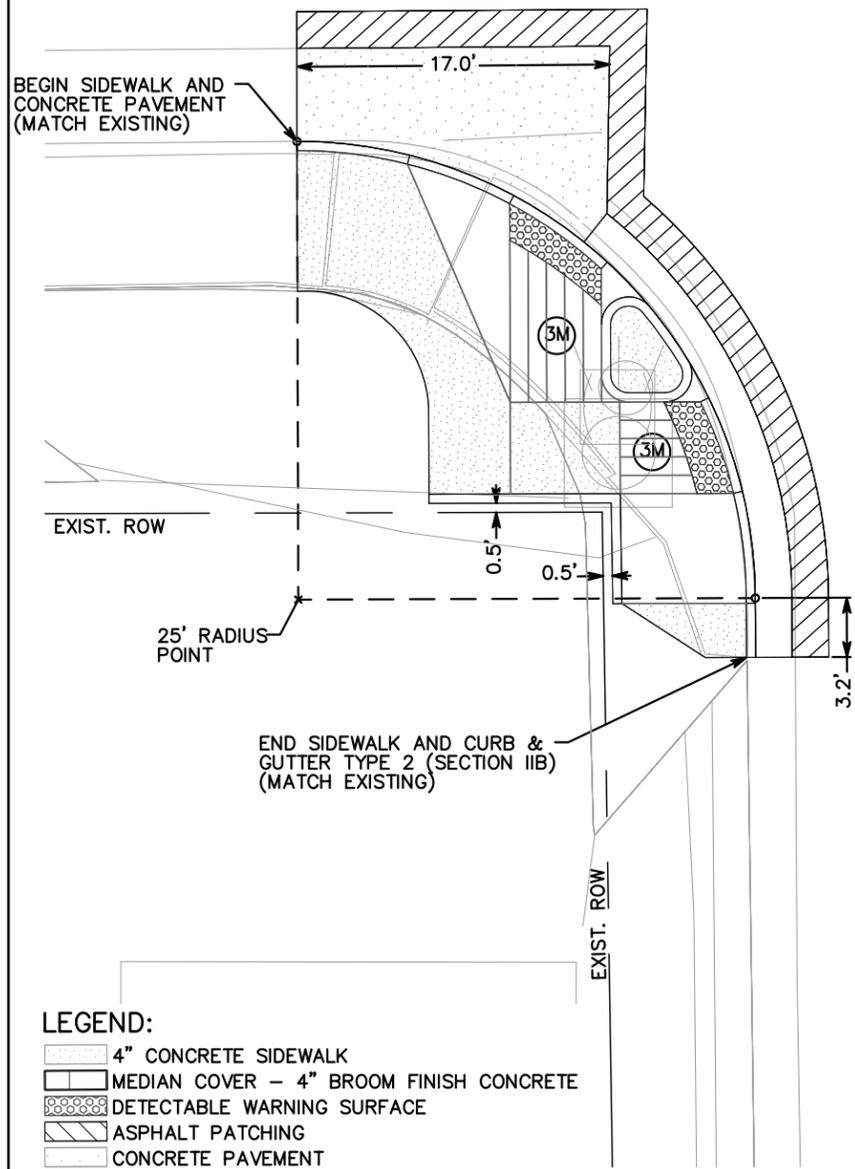


ALAMEDA AVENUE

NOTES:

1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADIi ESTABLISHED BY THE ENGINEER
2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
3. DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
4. NEW CONCRETE JOINTS ARE TO MATCH ANY ADJACENT EXISTING CONCRETE JOINTS
5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

- ③ CURB RAMP TYPE 3 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.3)
- ③M MODIFIED CURB RAMP TYPE 3 (SEE MISCELLANEOUS DETAILS (MODIFIED CURB RAMP TYPE 3))



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

Print Date: 7/11/2012	
Drawing File Name: rddt01B_Lipan.dgn	PW File Name
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 Region 6

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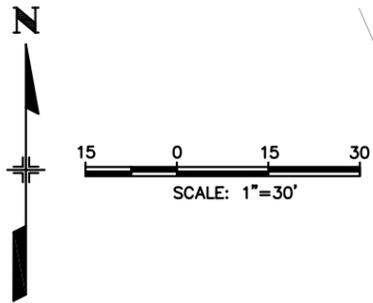
ALAMEDA AVENUE & LIPAN STREET ROADWAY DETAIL	
Designer: KJJ	Structure
Detailer: KJJ	Numbers
Sheet Subset:	Subset Sheets: RDT1B OF 14

Project No./Code
SHE R600-391
18197
Sheet Number 30



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 kjensen 9/13/05 AM

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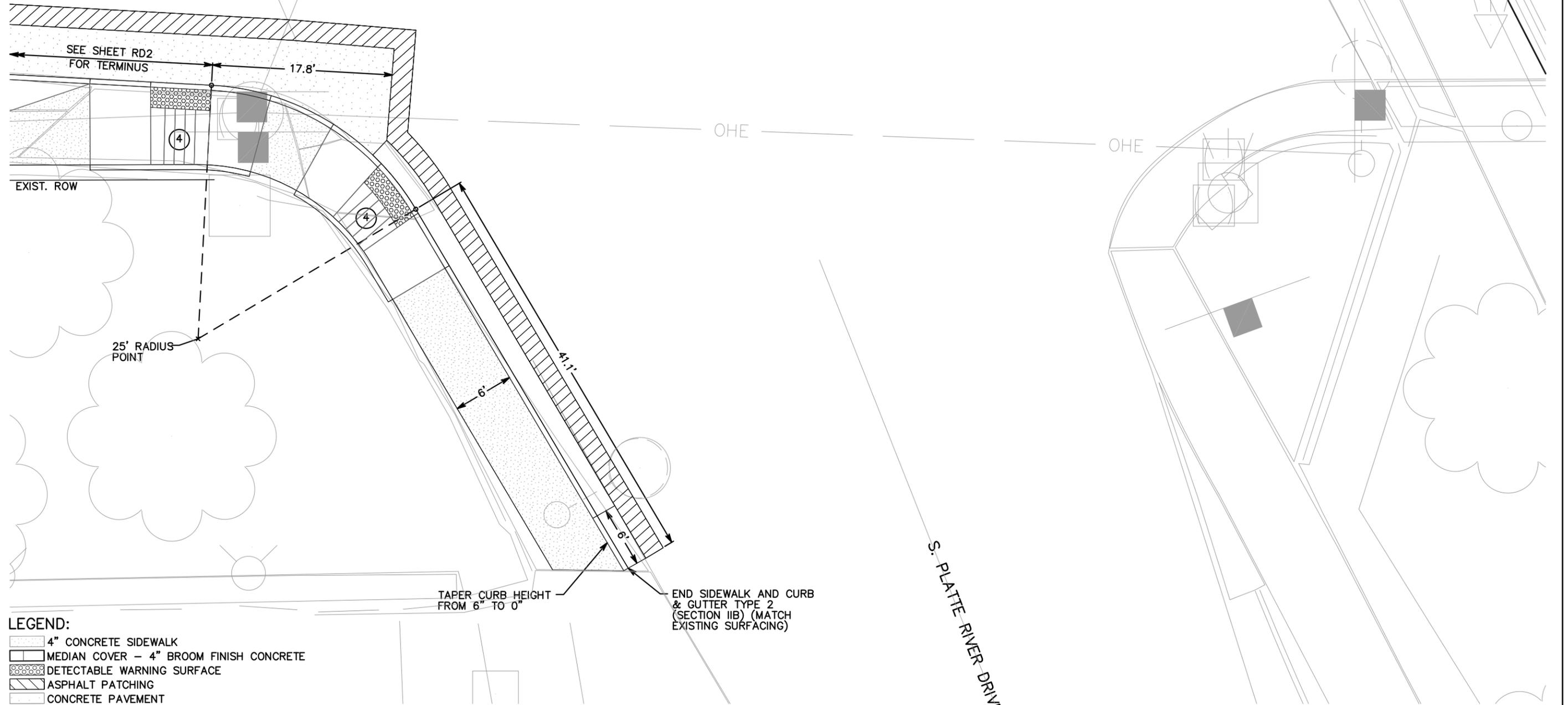


NOTES:

1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
3. DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
4. NEW CONCRETE JOINTS ARE TO MATCH ANY ADJACENT EXISTING CONCRETE JOINTS
5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

④ CURB RAMP TYPE 4 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.4)

ALAMEDA AVENUE
 PLATTE RIVER WATERWAY.
 NO PARKING, NO STAGING,
 NO WORK AREA



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

Print Date: 7/11/2012
 Drawing File Name: rddt02B_Platte.dgn PW File Name
 Horiz. Scale: 1:10 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

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Sheet Revisions		
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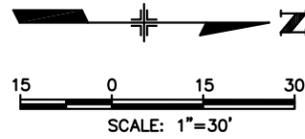


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 Region 6

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ALAMEDA AVENUE & PLATTE RIVER DRIVE ROADWAY DETAIL	
Designer: KJJ	Structure
Detailer: KJJ	Numbers
Sheet Subset:	Subset Sheets: RDT2B OF 14

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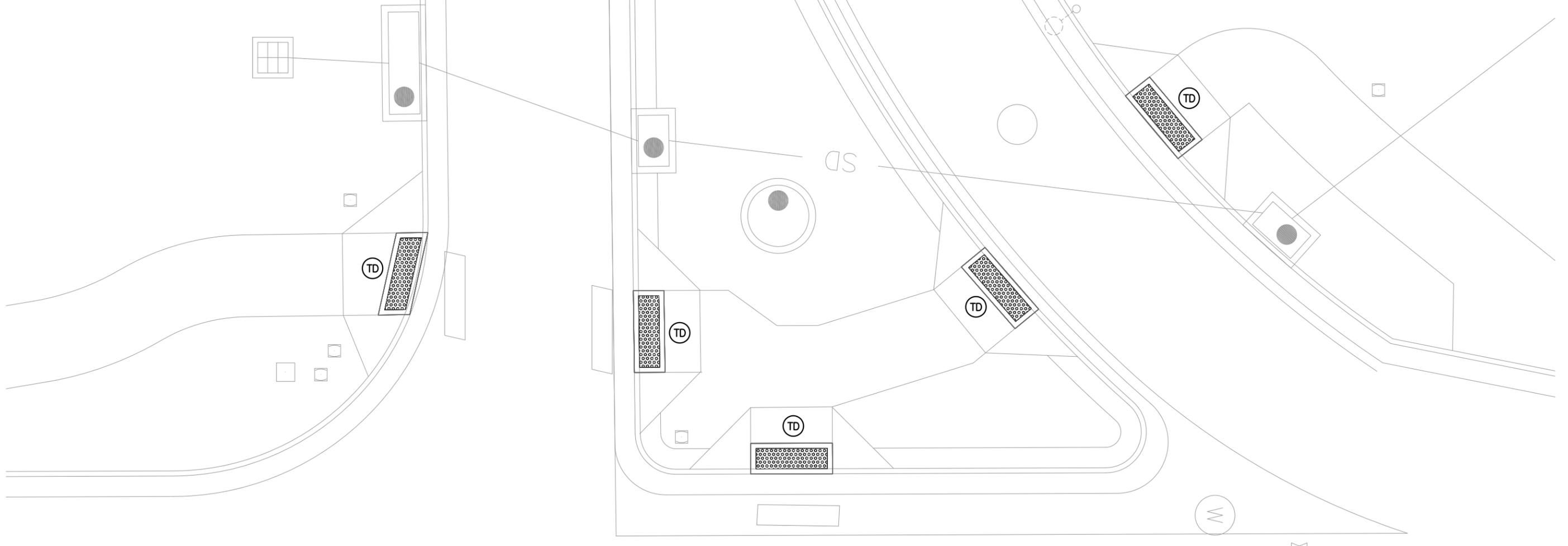


US 285 SB ON-RAMP

NOTES:

1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
3. DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
4. NEW CONCRETE JOINTS ARE TO MATCH ANY ADJACENT EXISTING CONCRETE JOINTS
5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

(TD) RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

SHERIDAN BOULEVARD

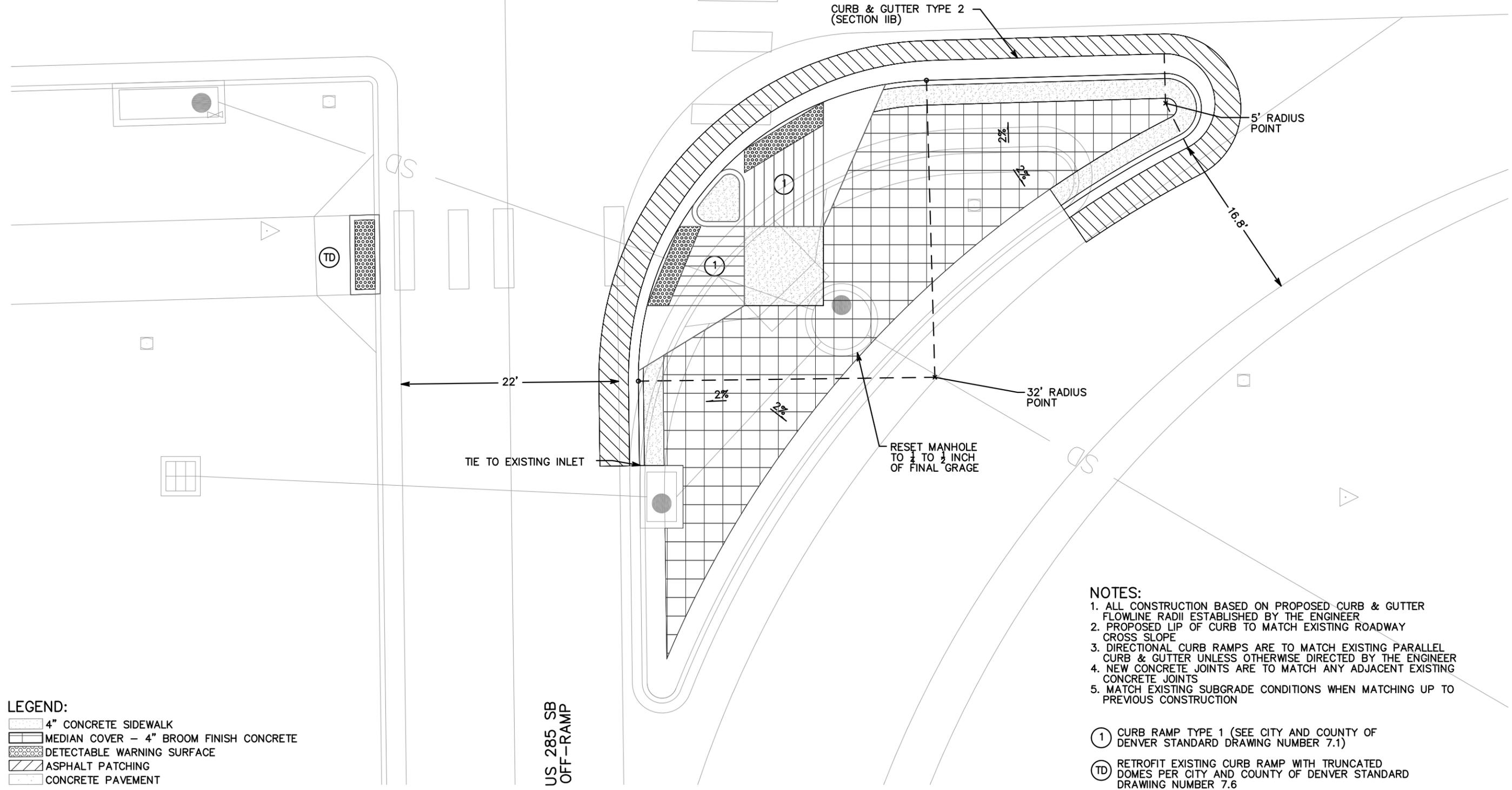
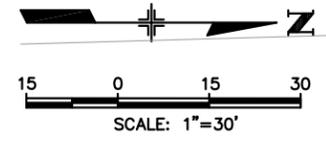
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Horiz. Scale: 1:10	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
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As Constructed	SB US 285 & SHERIDAN BOULEVARD ROADWAY DETAIL		Project No./Code
	No Revisions:		SHE R600-391
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	Sheet Subset:	Subset Sheets: RDT3A OF 14	Sheet Number 33



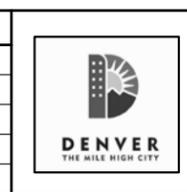
LEGEND:

	4" CONCRETE SIDEWALK
	MEDIAN COVER - 4" BROOM FINISH CONCRETE
	DETECTABLE WARNING SURFACE
	ASPHALT PATCHING
	CONCRETE PAVEMENT

- NOTES:**
- ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
 - PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
 - DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
 - NEW CONCRETE JOINTS ARE TO MATCH ANY ADJACENT EXISTING CONCRETE JOINTS
 - MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION
- ① CURB RAMP TYPE 1 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.1)
- Ⓣ RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6

Print Date: 7/11/2012	PW File Name
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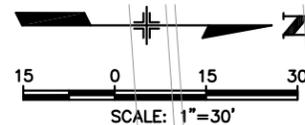


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Sheet Number 34



W. HAMPDEN AVENUE

CURB & GUTTER TYPE 2
(SECTION IIB)

2' RADIUS POINT

10' RADIUS POINT

NOTES:

1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
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- ① CURB RAMP TYPE 1 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.1)
- ⓉD RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6

LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

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SHE R600-391
18197
Sheet Number 35

SHERIDAN BOULEVARD

93.8'

57.2'

16.0'

17.5'

SD

SD

SA

SA

SA

①

①

ⓉD

ⓉD

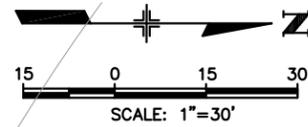
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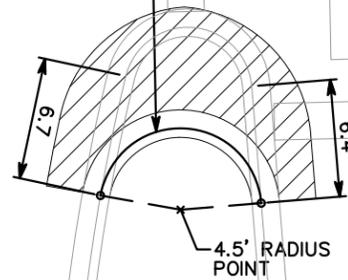
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SHERIDAN BOULEVARD

CURB & GUTTER TYPE 2
(SECTION IB)



US 285 NB ON-RAMP

US 285 NB OFF-RAMP

LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

NOTES:

1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
3. DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
4. NEW CONCRETE JOINTS ARE TO MATCH ANY ADJACENT EXISTING CONCRETE JOINTS
5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6

Print Date: 7/11/2012
 Drawing File Name: rddt04_NB 285.dwg PW File Name
 Horiz. Scale: 1:10 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

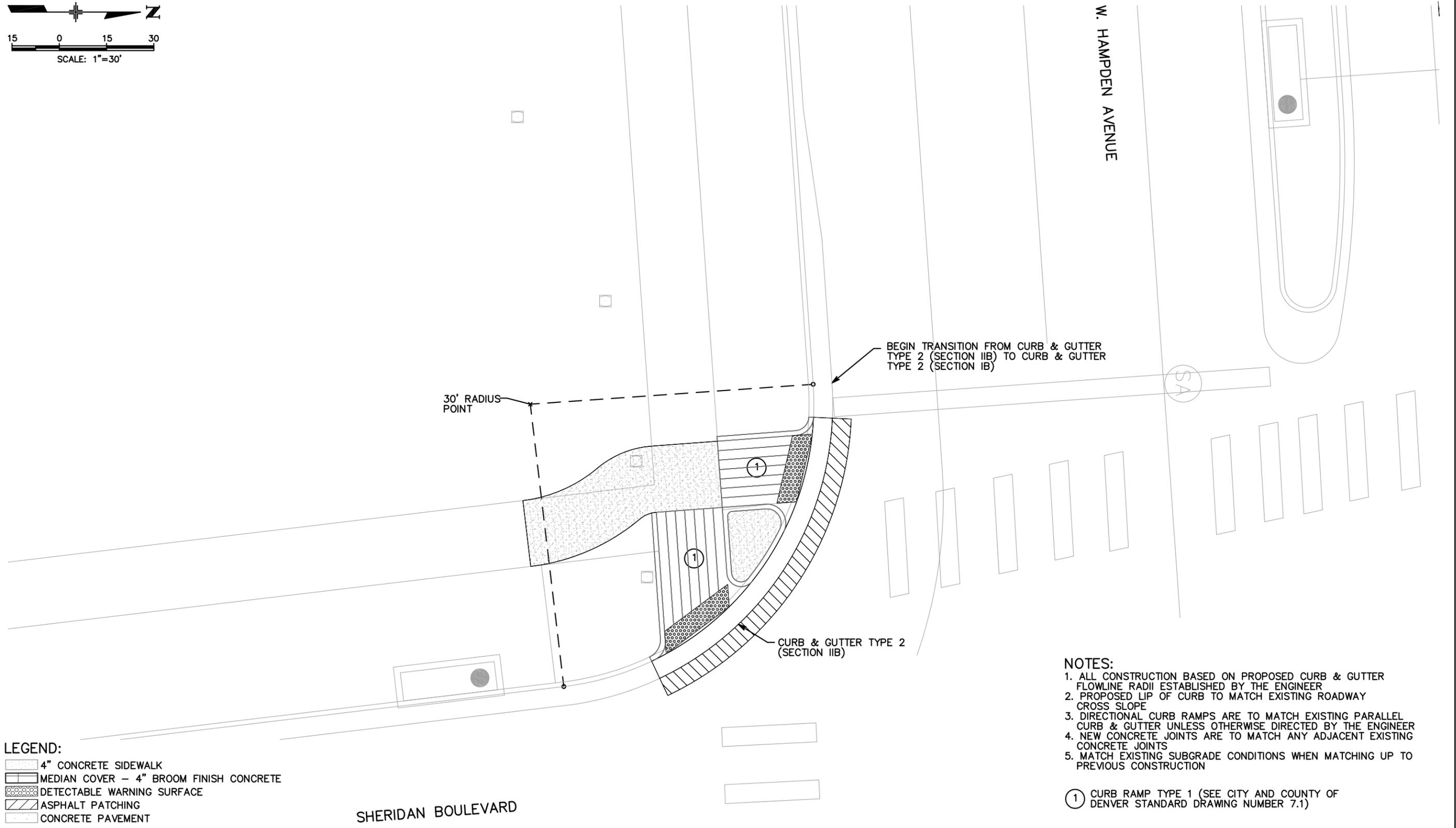
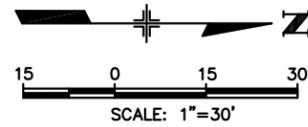
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 5420 Ward Road, Suite 125
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Sheet Revisions		
Date:	Comments	Init.



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 Denver, CO 80216
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 Region 6

As Constructed	NB US 285 & SHERIDAN BOULEVARD ROADWAY DETAILS		Project No./Code
No Revisions:	Designer: KJJ	Structure	SHE R600-391
Revised:	Detailer: KJJ	Numbers	18197
Void:	Sheet Subset:	Subset Sheets: RDT4B OF 14	Sheet Number 36



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

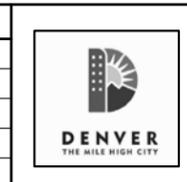
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① CURB RAMP TYPE 1 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.1)

Print Date: 7/11/2012	
Drawing File Name: rddt04C_NB 285.dgn	PW File Name
Horiz. Scale: 1:10	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
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Sheet Revisions		
Date:	Comments	Init.

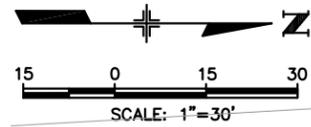


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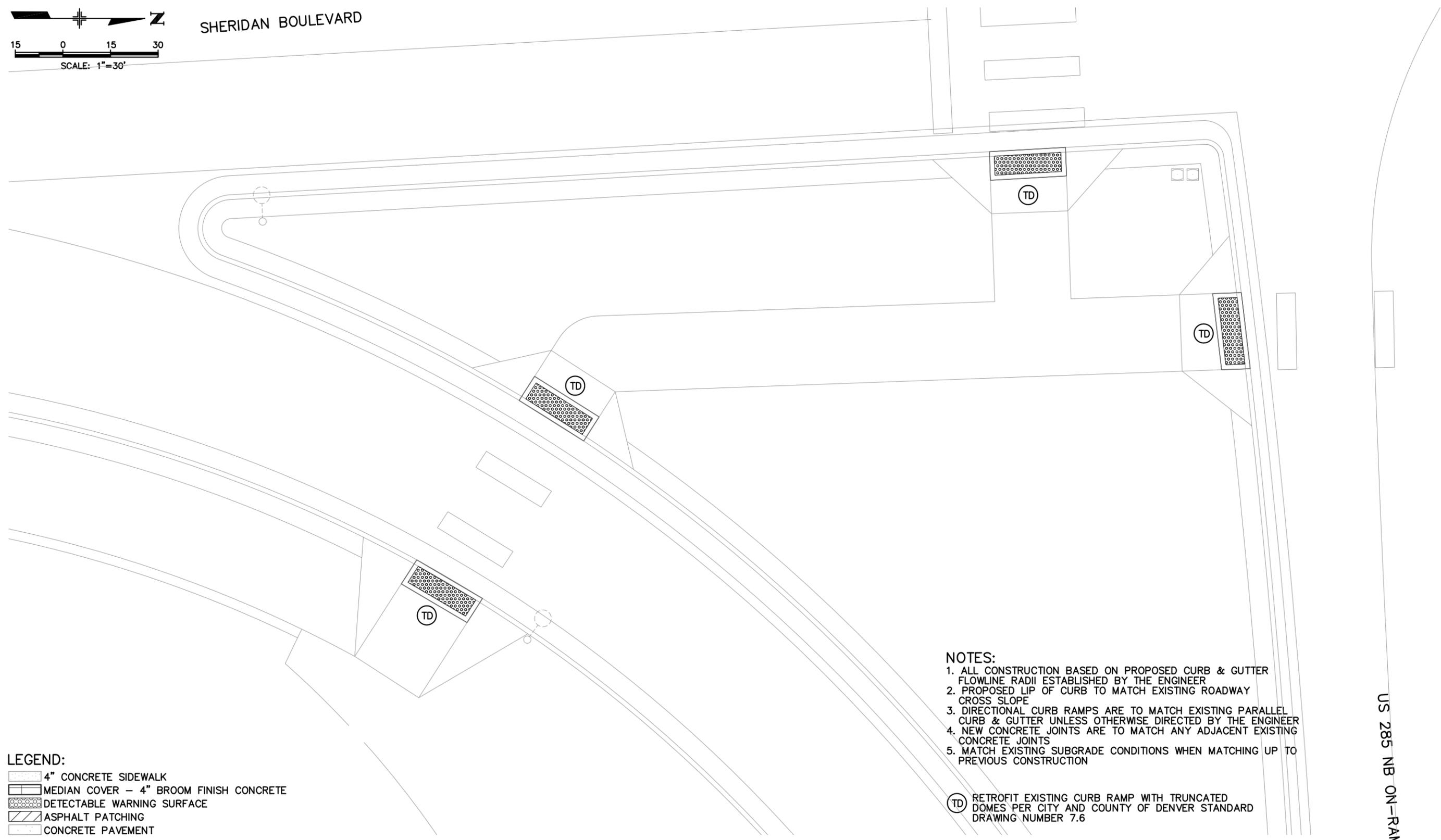
As Constructed
No Revisions:
Revised:
Void:

NB US 285 & SHERIDAN BOULEVARD ROADWAY DETAILS		
Designer:	KJJ	Structure
Detailer:	KJJ	Numbers
Sheet Subset:	Subset Sheets: RDT4C OF 14	

Project No./Code
SHE R600-391
18197
Sheet Number 37



SHERIDAN BOULEVARD



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT

NOTES:

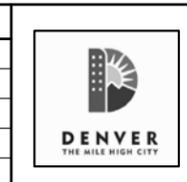
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RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6

US 285 NB ON-RAMP

Print Date: 7/11/2012	
Drawing File Name: rddt04D_NB 285.dgn	PW File Name
Horiz. Scale: 1:10	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250	

Sheet Revisions		
Date:	Comments	Init.



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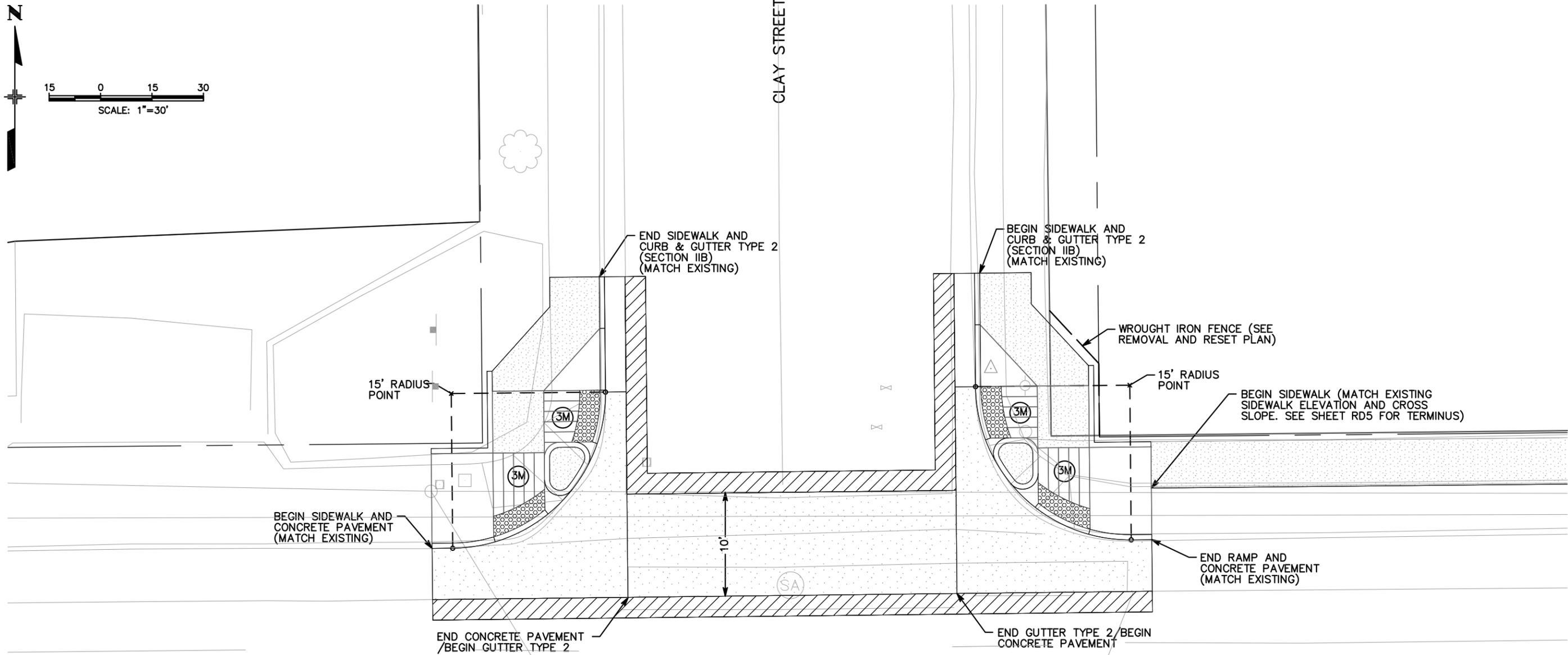
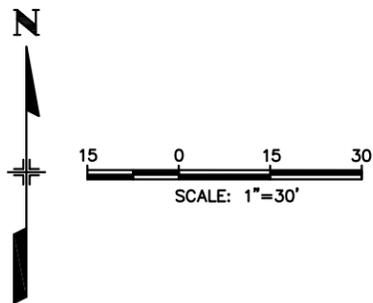
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As Constructed
No Revisions:
Revised:
Void:

NB US 285 & SHERIDAN BOULEVARD ROADWAY DETAILS		
Designer:	KJJ	Structure
Detailer:	KJJ	Numbers
Sheet Subset:	Subset Sheets: RD4D OF 14	

Project No./Code
SHE R600-391
18197
Sheet Number 38



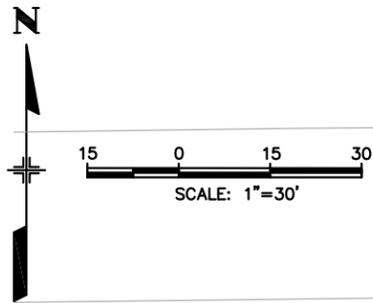
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 2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
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 5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

- LEGEND:**
- 4" CONCRETE SIDEWALK
 - MEDIAN COVER - 4" BROOM FINISH CONCRETE
 - DETECTABLE WARNING SURFACE
 - ASPHALT PATCHING
 - CONCRETE PAVEMENT

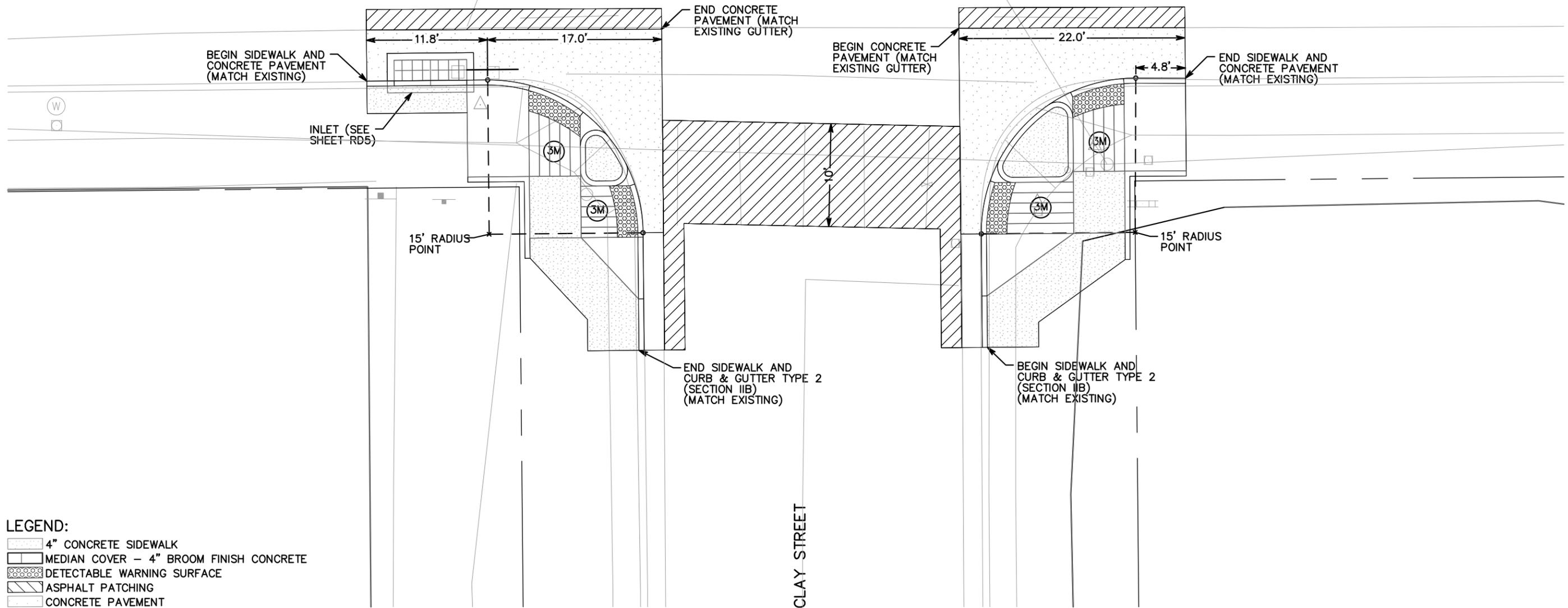
(3M) MODIFIED CURB RAMP TYPE 3 (SEE MISCELLANEOUS DETAILS (MODIFIED CURB RAMP TYPE 3))

ALAMEDA AVENUE

Print Date: 7/11/2012		Sheet Revisions			Colorado Department of Transportation Region 6	As Constructed	ALAMEDA AVENUE & CLAY STREET ROADWAY DETAILS		Project No./Code	
Drawing File Name: rddt05A_Clay.dgn	PW File Name	Date:	Comments				Init.	No Revisions:		
Horiz. Scale: 1:10	Vert. Scale: As Noted				Revised:	Designer: KJJ	Structure	18197		
Unit Information	Unit Leader Initials				Void:	Detailer: KJJ	Numbers	Sheet Number 39		
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- NOTES:**
1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
 2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
 3. DIRECTIONAL CURB RAMPS ARE TO MATCH EXISTING PARALLEL CURB & GUTTER UNLESS OTHERWISE DIRECTED BY THE ENGINEER
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 5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION
- ③ CURB RAMP TYPE 3 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.3)
- ③M MODIFIED CURB RAMP TYPE 3 (SEE MISCELLANEOUS DETAILS (MODIFIED CURB RAMP TYPE 3))



- LEGEND:**
- 4" CONCRETE SIDEWALK
 - MEDIAN COVER - 4" BROOM FINISH CONCRETE
 - DETECTABLE WARNING SURFACE
 - ASPHALT PATCHING
 - CONCRETE PAVEMENT

Print Date: 7/11/2012
 Drawing File Name: rddt05B_Clay.dgn PW File Name
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 Unit Information Unit Leader Initials

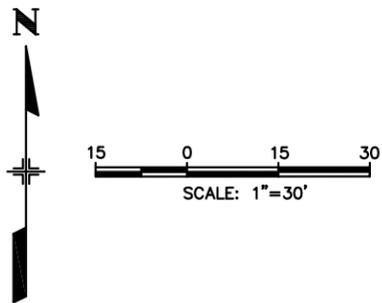
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Date:	Comments	Init.



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As Constructed	ALAMEDA AVENUE & CLAY STREET ROADWAY DETAILS		Project No./Code
No Revisions:			SHE R600-391
Revised:	Designer: KJJ	Structure	18197
Void:	Detailer: KJJ	Numbers	
	Sheet Subset:	Subset Sheets: RD5B OF 14	Sheet Number 40



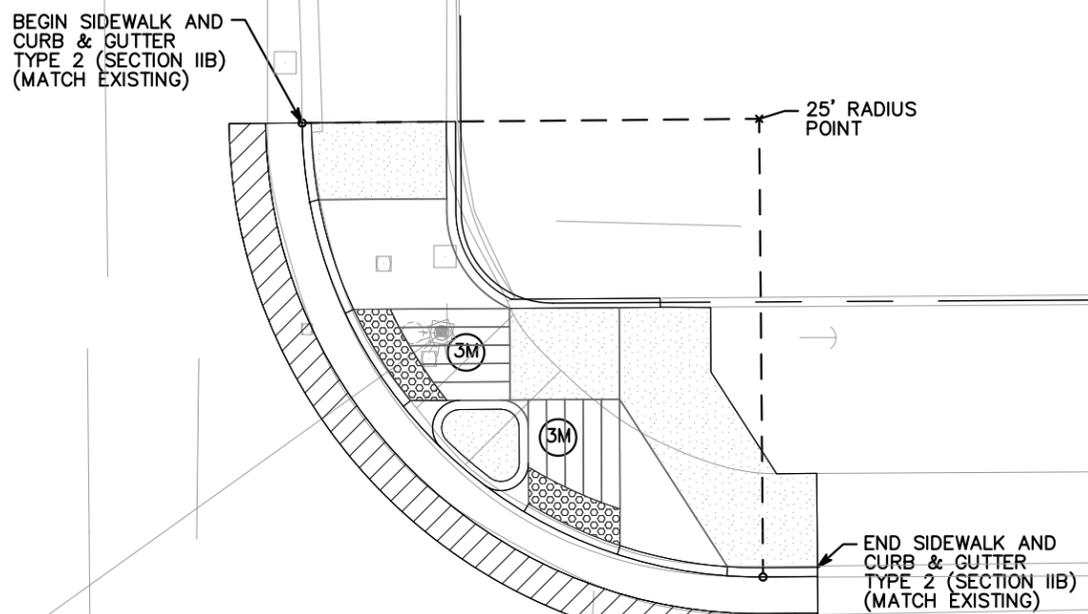
SHERIDAN BOULEVARD

WEST 25TH AVENUE

- LEGEND:**
- 4" CONCRETE SIDEWALK
 - MEDIAN COVER - 4" BROOM FINISH CONCRETE
 - DETECTABLE WARNING SURFACE
 - ASPHALT PATCHING
 - CONCRETE PAVEMENT

- NOTES:**
1. ALL CONSTRUCTION BASED ON PROPOSED CURB & GUTTER FLOWLINE RADII ESTABLISHED BY THE ENGINEER
 2. PROPOSED LIP OF CURB TO MATCH EXISTING ROADWAY CROSS SLOPE
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 5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

- MODIFIED CURB RAMP TYPE 3 (SEE MISCELLANEOUS DETAILS (MODIFIED CURB RAMP TYPE 3))
- RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6



WEST BYRON PLACE

Print Date: 7/11/2012	
Drawing File Name: rddt06A_25th.dgn	PW File Name
Horiz. Scale: 1:10	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
	5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.

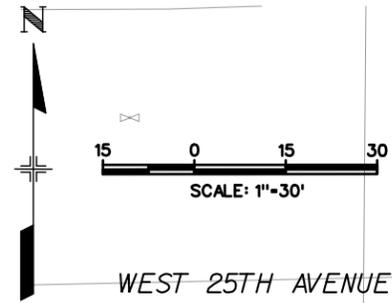


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As Constructed
No Revisions:
Revised:
Void:

SHERIDAN BOULEVARD & 25TH AVENUE ROADWAY DETAILS	
Designer: KJJ	Structure
Detailer: KJJ	Numbers
Sheet Subset:	Subset Sheets: RDT6A OF 14

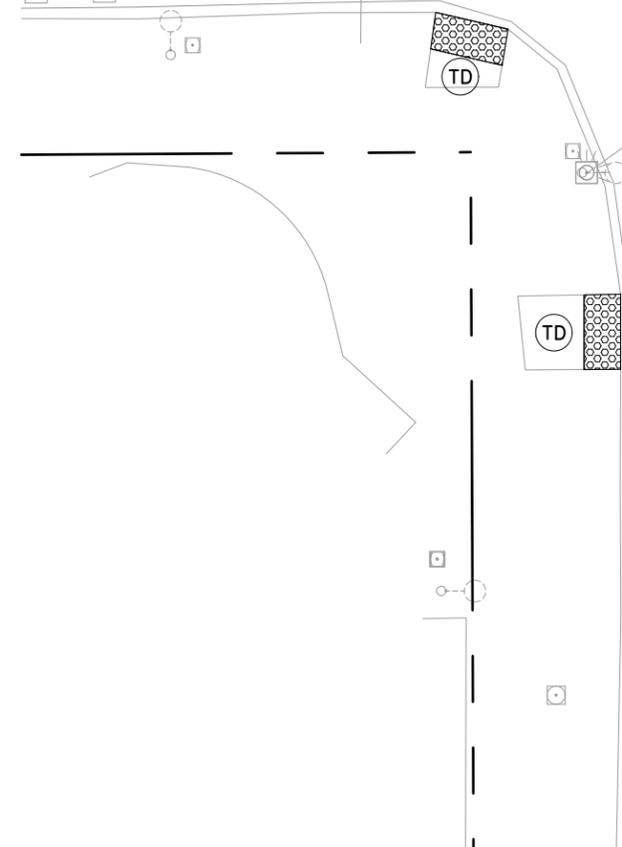
Project No./Code
SHE R600-391
18197
Sheet Number 41



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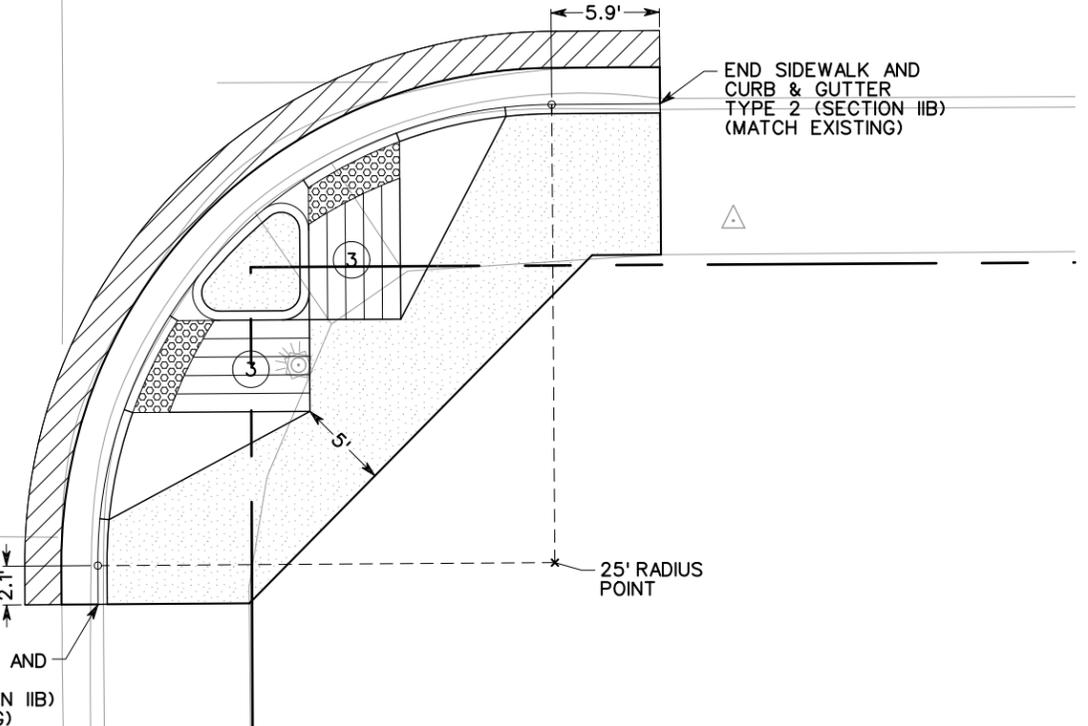
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5. MATCH EXISTING SUBGRADE CONDITIONS WHEN MATCHING UP TO PREVIOUS CONSTRUCTION

- ③ CURB RAMP TYPE 3 (SEE CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.3)
- TD RETROFIT EXISTING CURB RAMP WITH TRUNCATED DOMES PER CITY AND COUNTY OF DENVER STANDARD DRAWING NUMBER 7.6



LEGEND:

- 4" CONCRETE SIDEWALK
- MEDIAN COVER - 4" BROOM FINISH CONCRETE
- DETECTABLE WARNING SURFACE
- ASPHALT PATCHING
- CONCRETE PAVEMENT



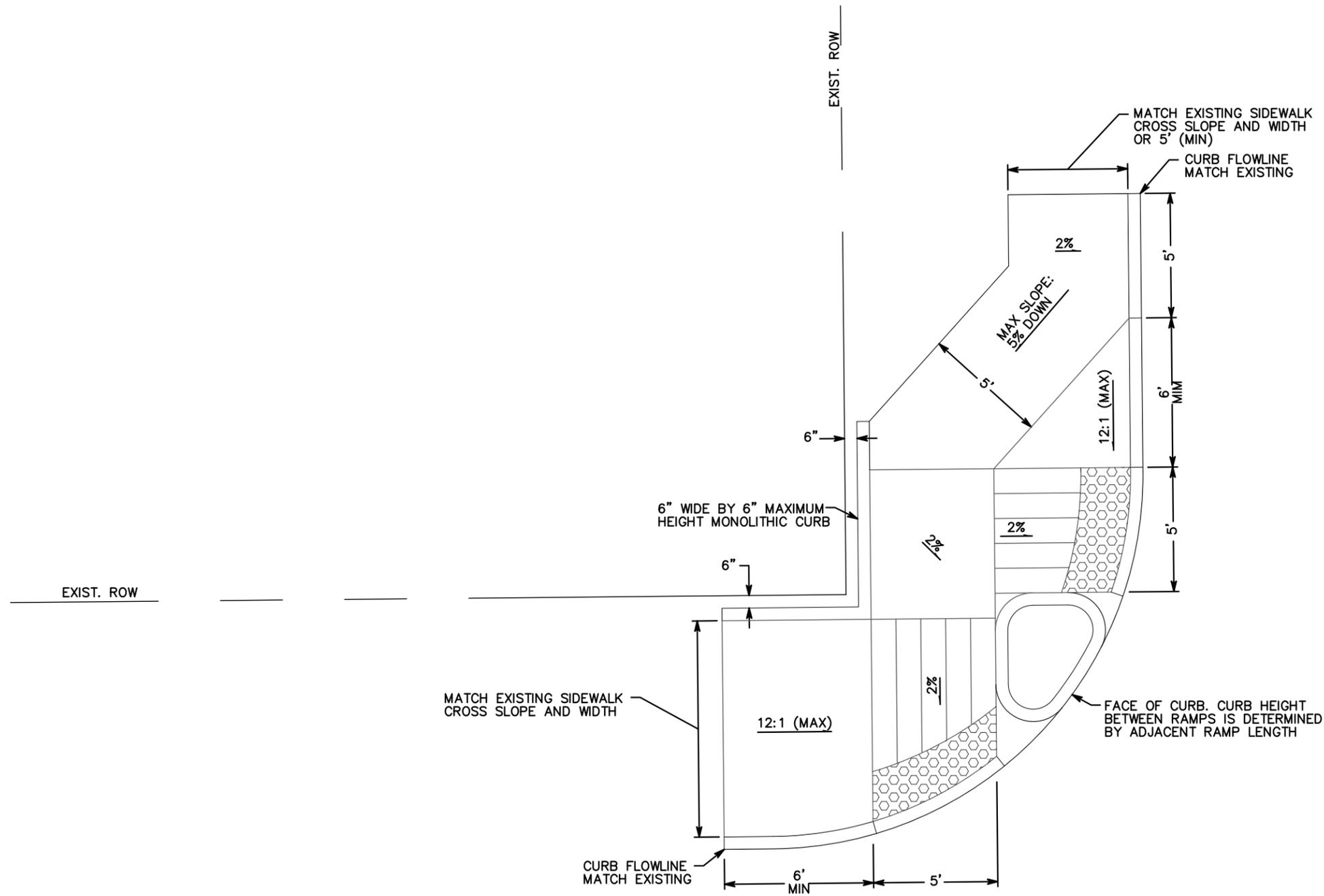
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Print Date: 11/30/2011		Sheet Revisions		As Constructed	SHERIDAN BOULEVARD & 25TH AVENUE ROADWAY DETAILS		Project No./Code
Drawing File Name: rddt06B_25th.dgn	PW File Name	Date:	Comments	No Revisions:	Designer: KJJ Detailer: KJJ		SHE R600-391
Unit Information	Unit Leader Initials			Revised:			18197
5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250				Void:	Sheet Subset:	Subset Sheets: RDT6B OF 14	Sheet Number 42



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 Region 6



 TRUNCATED DOMES (SEE CCD GENERAL NOTES FOR CURB RAMPS AND STD. NO. 7.6 FOR PLACEMENT)

- NOTES:**
1. SEE ROADWAY PLAN FOR FACE OF CURB RADIUS
 2. SEE ROADWAY PLAN FOR CURB & GUTTER/GUTTER TYPE 2 CONFIGURATION
 3. SEE ROADWAY PLAN FOR ORIENTATION OF MODIFIED TYPE 3 CURB RAMP
 4. SEE CCD STANDARD DRAWING NO. 7.0c, TYPICAL CURB RAMP CROSS SECTION
 5. SEE CCD STANDARD DRAWING NO. 7.0a, GENERAL NOTES FOR CURB RAMPS



Print Date: 7/11/2012
 Drawing File Name: msdt01.dgn PW File Name
 Horiz. Scale: 1:5 Vert. Scale: As Noted
 Unit Information Unit Leader Initials
CENTENNIAL ENGINEERING, INC.
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 Arvada, CO 80002
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Sheet Revisions		
Date:	Comments	Init.



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MISCELLANEOUS DETAILS (MODIFIED CURB RAMP TYPE 3)		
Designer:	KJJ	Structure
Detailer:	KJJ	Numbers
Sheet Subset:	Subset Sheets: MDT1 OF 1	

Project No./Code
 SHE R600-391
 18197
 Sheet Number 43

TRAFFIC SIGNAL GENERAL NOTES:

- Traffic signal materials and installation shall comply with the City & County of Denver Project Specials, the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction 2011 Edition, the Manual on Uniform Traffic Control Devices, the National Electric Code, and all other pertinent local regulations and ordinances.
- New pole locations shall be confirmed in the field by the City & County of Denver Traffic Engineering Services (TES) staff prior to foundation installation. New cabinet and electrical meter assembly locations shall be confirmed in the field by the City & County of Denver TES staff prior to installation of cabinet foundation or meter base, respectively.
- Items not shown in the Summary of Quantities shall be considered incidental to the traffic signal installation and will not be measured and paid separately.
- Five inch solid black back plates shall be furnished by the Contractor and installed on all traffic signal heads which are so labeled on the plans. Back plates will be considered included in the unit price of the traffic signal heads and will not be measured and paid for separately. Back plates shall not be installed on those pole-mounted heads installed on two-way spacers.
- All new traffic signals shall be provided with new metered power sources by Xcel Energy. Labor and materials to provide feed, connect, extend to or otherwise facilitate power service at the intersection are considered included in the work and will not be measured and paid separately. Separate power feeds shall be provided for traffic signal and street lighting. In some cases, the existing power source may be retained.
- Directionally bored conduit, if approved, shall be Schedule 80 HDPE. All other conduit shall be Schedule 80 PVC or HDPE. This directive supersedes the conduit schedules shown in the City & County of Denver standard drawings.
- All signal heads and hardware including spacers, elbows, plumbizers and plates shall be painted dark green to match signal poles in conformance with Federal Specification 14056.
- All surface materials including landscaping and sprinkler systems which are disturbed by excavation and backfilling operations shall be replaced in kind equal to or exceeding original condition at no additional cost to the project. Any concrete including sidewalks and curb ramps damaged by operations of the Contractor shall be removed and replaced to the nearest existing joint at no additional cost to the project.
- If applicable, contractor shall field verify camera locations and angles with the City & County of Denver prior to installation of detection equipment and mounting hardware thereto. Contractor shall coordinate set-up, debugging and verification of video phase detection with City forces during installation of video detection system.
- At completion of construction, Contractor shall test all fiber optic links for traffic signal system communications between the controllers and signal system computer located downtown. Any communication failures shall be reported to the Engineer. Testing of communications system shall be considered included in the unit cost for Telemetry (Field) and will not be measured and paid separately.
- Contractor shall install foundations for new poles to be installed and rake the poles following installation of luminaires, luminaire arms, mast arms and all equipment attached thereto. Anchor bolts shall be furnished and installed by the Contractor for all new signal poles and are included in the unit cost for new poles. Pole rake shall include provision of a true vertical after loading. Foundation work shall include grouting by the Contractor after pole rake is approved. This work shall be included in the unit cost for Traffic Signal Poles.
- All pull boxes provided for street lighting shall be Type A as depicted in the attached Denver Standard Drawings. Type A boxes shall be included in the unit cost for electrical conduit and will not be measured and paid separately. All traffic pull boxes shall be Type B as depicted in the attached Denver Standard Drawings. Type B boxes shall be included in the unit cost for electrical conduit and shall not be measured and paid separately. Communications pull boxes shall be Type C as depicted in the Denver Standard Drawings and shall be measured and paid as Pull Box (Special).
- Conduit shall be trenched or bored at the contractor's option. Note that contractor may be directed by the Engineer or Denver TES to directionally bore conduit runs crossing Alameda Avenue, Sheridan Blvd., or the US-285 ramps.
- All new controller cabinet locations shall include foundation constructed with preformed composite material with battery racks inside to accommodate mounting of internal UPS Assembly. Cabinet foundation shall accommodate NEMA P-sized cabinet. Cabinet, controller and pre-cast foundation shall be furnished by the City and installed by the Contractor.
- Fire preemption unit and timer shall include optical detectors and all required in-cabinet equipment at each intersection. Optical detectors are required for all vehicular approaches so indicated in the plans. The item shall include a four channel card.

TRAFFIC SIGNAL REMOVAL GENERAL NOTES:

- Pedestal poles and traffic signal poles or span wire poles without luminaires shall be removed by the Contractor. Luminaires, luminaire arms, selected light poles and traffic signal-light poles shall be removed by XCEL Energy. Coordinate as required with XCEL Energy to schedule activities and facilitate timely removal of poles. See Utilities Specification for additional information.
- Existing controller cabinet foundations shall be removed by the Contractor in their entirety. Existing traffic signal pole and pedestal pole foundations shall be removed by the Contractor to minimum depth of 1 foot below finish grade. Existing foundations for light poles to be removed by XCEL Energy adjacent to the Alameda intersections of Lipan and Platte River Drive shall be removed by the Contractor to minimum depth of 1 foot below finish grade.
- Existing signal conduit shall be abandoned unless otherwise indicated. Existing communications conduit and pull boxes shall be protected and maintained throughout construction unless otherwise indicated.
- Remove and dispose of all existing sign panels attached to the existing signal poles, mast arms and span wire cable. This work is considered included in the lump sum cost for Removal of Traffic Signal Equipment and will not be measured and paid separately.
- All removed equipment designated for salvage shall be delivered to Denver Traffic Operations, 5440 Roslyn Street, Denver. See specifications for specific items to be salvaged - essentially all electronic components are designated for salvage.
- Removal of Traffic Signal Equipment shall be paid on a lump sum basis and shall include physical disconnection, disassembly and removal of the included items; disposal of non-salvageable material including removed foundations and so on; backfill of excavated removal areas; and surface restoration of areas disturbed by removal activities. Delivery of salvaged items to the City maintenance yard shall be considered included in the lump sum cost.
- At the three Alameda intersections, XCEL Energy will remove, relocate or raise overhead power lines attached to existing signal or power poles. Coordinate all construction schedules with XCEL accordingly. See Utilities Specification for additional information.

TRAFFIC SIGNAL INSTALLATION GENERAL NOTES:

- New power sources are to be provided by XCEL Energy. At each intersection, Contractor shall install new feed from proposed power source to new cabinet.
- All traffic signal heads shall be L.E.D. type. All side-mount traffic signal and pedestrian heads shall be polycarbonate L.E.D. type. All pedestrian heads shall have countdown functionality as depicted in the plans.
- Push buttons shall be provided to cross Alameda Avenue or Sheridan Boulevard only, as applicable. All pedestrian movements to cross side streets will be non-actuated.
- Duration of allowed outage of signal system communications at individual intersections shall be as determined by Denver Traffic Engineering Services (TES) Division. Contractor shall schedule all such work with Denver TES at least two weeks in advance of the proposed interconnect disconnection/reconnection work. Notify the Engineer of all such correspondence. Contact Paul Bountry at Denver TES at 720-913-4840 to schedule all such communications outages at least two weeks in advance of intended shut down period.
- CDOT 2012 construction project rebuilds portions of Lipan and Platte River Drive intersections along Alameda. Because CDOT design of this work was not complete as of the date of these plans, locations of design features and improvements thereto are a best approximation only and may not be depicted accurately herein. Therefore all existing conditions at these locations shall be reviewed in the field by the Contractor and the Engineer before start of construction. Purpose of the review will be to verify improvements constructed by the 2012 CDOT project and consequences of that project as it may pertain to the work depicted in these plans.

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Print Date: 4/25/2012		Sheet Revisions			 DENVER <small>THE MILE HIGH CITY</small>	As Constructed		TRAFFIC SIGNAL PLAN			Project No./Code	
Drawing File Name: 01-gen_notes.dgn		Date:	Comments	Init.		No Revisions:		GENERAL NOTES			SHE R600-391	
Horiz. Scale: 1:1	Vert. Scale: As Noted					Revised:	Designer: SJS	Structure			18197	
Unit Information	Unit Leader Initials					Void:	Detailer: JRM	Numbers			Sheet Number 44	
 CENTENNIAL <small>ENGINEERING, INC.</small>		5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250			 Region 6		4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781		Sheet Subset:		Subset Sheets: TR1 of TR26	

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	ALAMEDA & CLAY	ALAMEDA & LIPAN	ALAMEDA & PLATTE RIVER DRIVE	SHERIDAN & US 285 NB RAMPS	SHERIDAN & US 285 SB RAMPS	SHERIDAN & 25TH/BYRON	PROJECT TOTALS
202	Removal of Traffic Signal Equipment	Lump Sum	1	1	1	1	1	1	1
503	Drilled Caisson (36 Inch)	Lin. Feet	32	49	52	49	49	62	293
503	Drilled Caisson (48 Inch)	Lin. Feet				17			17
613	2 Inch Electrical Conduit (Plastic)	Lin. Feet	260	90	10	365	345	270	1340
613	3 Inch Electrical Conduit (Plastic)	Lin. Feet	675	185	30	900	860	600	3250
■ 613	Pull Box (Special)	Each	3	1	1	2	3	2	12
613	Wiring	Lump Sum	1	1	1	1	1	1	6
613	Electric Meter Pedestal Cabinet and Base	Each	1	1	1	1	1	1	6
614	Pedestrian Signal Face (16) (Countdown)	Each	8	6	8	8	6	8	44
614	Traffic Signal Face (12-12-12)	Each	14	12	11	20	13	14	84
614	Traffic Signal Face (12-12-12-12)	Each		2	2				4
614	Traffic Signal Controller and Cabinet (Install Only)	Each	1	1	1	1	1	1	6
◆ 614	Fire Preemption Unit and Timer	Each	1	1	1	1	1	1	6
● 614	Intersection Detection System (Camera)	Each	2	3	3	3	2	2	15
614	Pedestrian Push Button	Each	4	3	4	4	2	4	21
614	Span Wire Cable	Lin. Feet			400				400
●● 614	Traffic Signal Light Pole Steel	Each	2				1		3
614	Traffic Signal-Light Pole Steel (1 Mast Arm)	Each		3		4	3	4	14
614	Traffic Signal-Light Pole Steel (2 Mast Arm)	Each	2						2
614	Traffic Signal-Light Span Wire Pole (16 Inch)	Each			4				4
614	Telemetry (Field)	Each	1	1	1	1	1	1	6
614	Closed Circuit Television	Each	1	1	1	1	1	1	6

- All required cameras and in-cabinet equipment. Includes all wiring, camera orientation, ancillary mounting hardware, labor and materials for a fully functional installation as approved by the Engineer. Item measured by number of cameras. In-cabinet unit shall be 24-volt AC capable of Ethernet communications with video over power capability.
- ◆ All required detectors and in-cabinet equipment. Includes all wiring, detector orientation, ancillary mounting hardware, labor and materials for a fully functional installation as approved by the Engineer. Item measured by number of intersections.
- Type A pull boxes for street lighting and Type B pull boxes for traffic signal wiring included in cost of conduit and will not be measured and paid separately.
- Precast 24-inch pole footing included in cost of pole and not measured and paid separately.

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Print Date: 4/25/2012 Drawing File Name: 02-summ_quant.dgn Horiz. Scale: 1:1 Unit Information	Vert. Scale: As Noted Unit Leader Initials	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Sheet Revisions</th> </tr> <tr> <th>Date:</th> <th>Comments</th> <th>Init.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Sheet Revisions			Date:	Comments	Init.										 DENVER THE MILE HIGH CITY	Colorado Department of Transportation  Region 6 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781	As Constructed No Revisions: Revised: Void:	TRAFFIC SIGNAL PLAN SUMMARY OF QUANTITIES	Project No./Code SHE R600-391 18197 Sheet Number 45
Sheet Revisions																						
Date:	Comments	Init.																				


CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
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(R-X)
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Designer: SJS
 Detailer: JRM
 Structure Numbers
 Sheet Subset:
 Subset Sheets: TR2 of TR26

KEY NOTES:

NOTE: THIS LIST AUGMENTS AND SUPERSEDES THE KEY NOTES
DEPICTED IN THE ATTACHED DENVER STANDARD DRAWINGS.

REMOVALS

- 1A** REMOVE SIGNAL HEAD
- 1B** REMOVE SIGNAL POLE
- 1D** REMOVE SIGNAL CABINET, CONTROLLER, PULL BOXES & WATER VALVE PULL BOXES
- 1E** REMOVE MAST ARM
- 1F** REMOVE SPAN WIRE, CABLE AND ALL ATTACHED SIGNAL HEADS AND EQUIPMENT
- 1G** REMOVE PUSH BUTTON
- 1H** ELECTRIC UTILITY COMPANY TO REMOVE EXISTING POLE
- 1J** ELECTRIC UTILITY COMPANY TO REMOVE, RELOCATE OR RAISE EXISTING OVERHEAD POWERLINE.
- 1K** REMOVE AND REPLACE COMMUNICATIONS PULL BOX SUCH THAT NEW LID IS SEATED FLUSH WITH PROPOSED SIDEWALK OR CURB RAMP SURFACE
- 1L** REMOVE AND SALVAGE DETECTION CAMERA
- 1M** REMOVE EXISTING POLE FOUNDATION TO MINIMUM DEPTH OF 1' BELOW FINISH GRADE
- 1N** REMOVE EXISTING PULL BOX AND REPLACE WITH PULL BOX (SPECIAL) FOR SIGNAL SYSTEM COMMUNICATIONS

RESETS

- 2A** RESET SIGNAL HEAD
- 2B** RESET SIGNAL POLE
- 2C** RESET SIGNAL CONTROLLER, CABINET AND ASSOCIATED EQUIPMENT
- 2D** RESET PUSH BUTTON
- 2G** RESET SPAN WIRE
- 2H** RESET SPAN WIRE AND ALL ATTACHED SIGNAL EQUIPMENT
- 2J** RESET DETECTOR
- 2K** ELECTRIC UTILITY COMPANY TO RESET EXISTING POLE

PROTECT AND PRESERVE

- 4A** PROTECT AND PRESERVE TRAFFIC SIGNAL SYSTEM COMMUNICATIONS ELEMENTS THROUGHOUT CONSTRUCTION

INSTALLATIONS

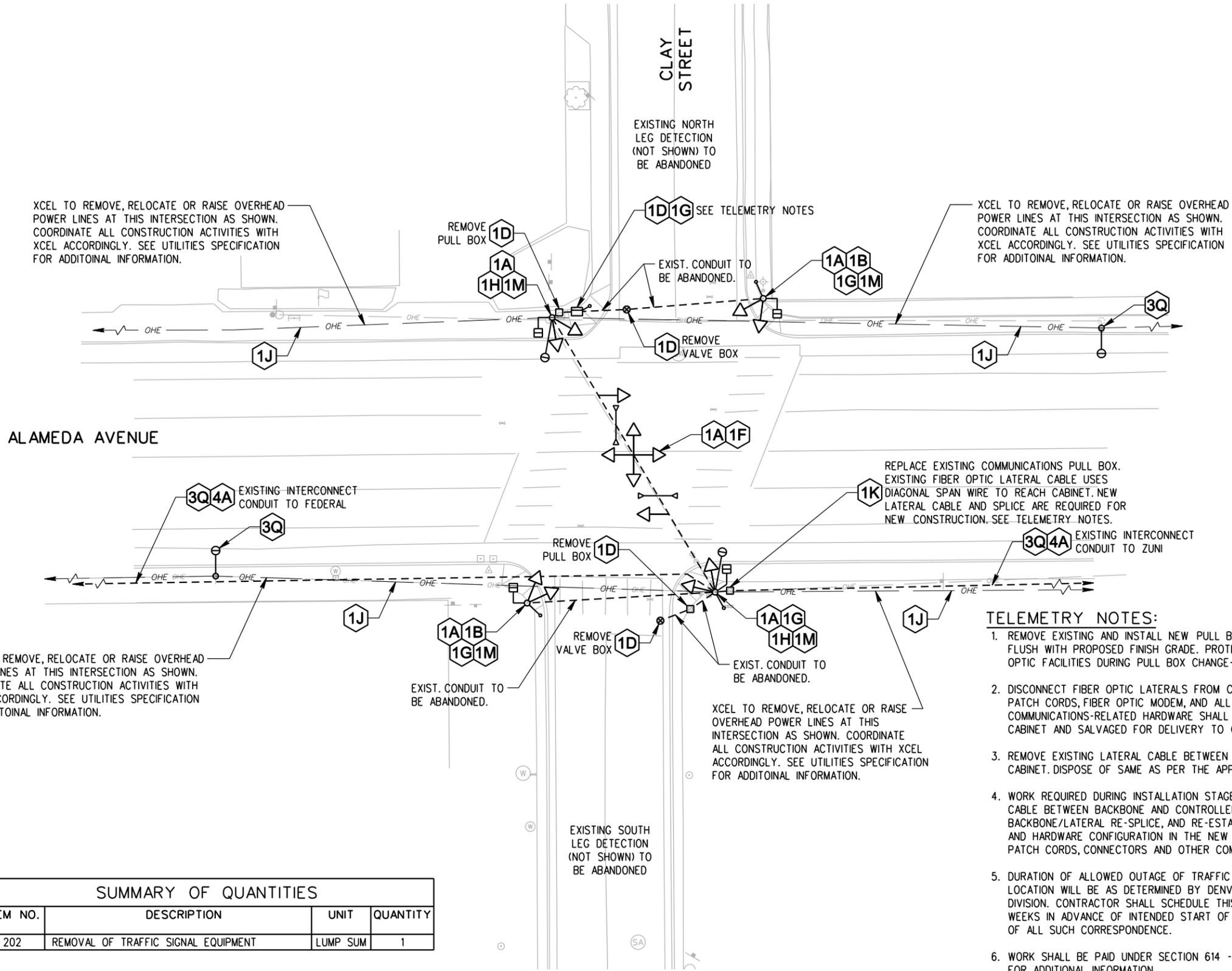
- 3A** INSTALL SIGNAL HEAD OR HEADS
- 3B** INSTALL SIGNAL CABINET, CONTROLLER AND ASSOCIATED EQUIPMENT
- 3C** INSTALL PUSH BUTTON
- 3D** INSTALL CONDUIT
- 3D(3)** INSTALL THREE CONDUITS (TWO 3-INCH CONDUITS AND ONE 2-INCH CONDUIT)
- 3D(4)** INSTALL FOUR CONDUITS (THREE 3-INCH CONDUITS AND ONE 2-INCH CONDUIT)
- 3E** INSTALL SIGNAL POLE
- 3F** INSTALL MAST ARM - (LENGTH AS SHOWN)
- 3G** INSTALL SPAN WIRE
- 3H(SPECIAL)** INSTALL PULL BOX MARKED "TRAFFIC COMM" ON LID
- 3H(2)** INSTALL TWO PULL BOXES ONE MARKED "TRAFFIC" ONE MARKED "ELECTRIC" ON LIDS
- 3H(3)** INSTALL THREE PULL BOXES, ONE EACH TYPE A, B, AND C. TYPE A BOX MARKED "ELECTRIC" ON LID; TYPE B BOX MARKED "TRAFFIC" ON LID; TYPE C BOX LABELED "TRAFFIC COMM" ON LID
- 3J** INSTALL DETECTOR
- 3K** ELECTRIC UTILITY COMPANY TO INSTALL SIGNAL POLE
- 3L** ELECTRIC UTILITY COMPANY TO INSTALL POWER FEED. CONTRACTOR TO EXTEND TO CONTROLLER
- 3M** ELECTRIC UTILITY COMPANY TO INSTALL LUMINAIRE
- 3N** INSTALL LUMINAIRE
- 3P** INSTALL WATER VALVE PULL BOX
- 3Q** NO CHANGE
- 3S** INSTALL STREET LIGHT STANDARD
- 3T** INSTALL OPTICOM
- 3U** INSTALL INTERCONNECT (SIZE & TYPE AS SHOWN)
- 3V** INSTALL VIDEO DETECTION CAMERA
- 3W** INSTALL ELECTRIC METER
- 3X** INSTALL CCTV CAMERA ON LUMINAIRE ARM
- 3Y** INSTALL COMPOSITE CABINET BASE FOR P-SIZED CONTROLLER CABINET

SYMBOLS:

- PULL BOX EXISTING
- PULL BOX NEW
- CONTROLLER CABINET EXISTING
- CONTROLLER CABINET NEW
- EXISTING POLE
- NEW POLE
- ◄ FIRE PREEMPTION DETECTOR
- PEDESTRIAN PUSH BUTTON EXISTING
- PEDESTRIAN PUSH BUTTON NEW
- UNDERGROUND CONDUIT
- SPAN WIRE CABLE
- LUMINAIRE EXISTING
- LUMINAIRE NEW
- ▷ EXISTING SIGNAL HEAD WITH BACKPLATE
- ▷ NEW SIGNAL HEAD WITH BACKPLATE
- ▷ EXISTING SIGNAL HEAD
- ▷ NEW SIGNAL HEAD
- ┌┐ SIGN PANEL (MAST ARM MOUNTED)
- ◻ CLOSED CIRCUIT TELEVISION CAMERA
- ◼ VIDEO DETECTION CAMERA
- ◻ PEDESTAL POLE EXISTING
- ◼ PEDESTAL POLE NEW
- ⚡ FLASHING BEACON
- ⊕⊕⊕ EXISTING THREE-ARROW SIGNAL HEAD
- ⊕⊕⊕ NEW THREE-ARROW SIGNAL HEAD
- ⊗ EXISTING WATER VALVE PULL BOX
- OHE — OVERHEAD ELECTRIC LINE
- ◆ NEW ELECTRIC METER ASSEMBLY

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Print Date: 4/24/2012	Sheet Revisions			 DENVER <small>THE MILE HIGH CITY</small>	 Colorado Department of Transportation <small>4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781</small> Region 6	As Constructed	TRAFFIC SIGNAL PLAN KEY NOTES & SYMBOLS			Project No./Code
Drawing File Name: 03-key-notes.dgn	Date:	Comments	Init.			No Revisions:				SHE R600-391
Horiz. Scale: 1:1 Vert. Scale: As Noted	(R-X)					Revised:	Designer: SJS	Structure Numbers	18197	
Unit Information Unit Leader Initials	○					Void:	Detailer: JRM	Subset Sheets: TR3 of TR26	Sheet Number 46	
 CENTENNIAL ENGINEERING, INC. <small>5420 Ward Road, Suite 125 Arvado, CO 80002 (720) 279-7250</small>	○									



XCEL TO REMOVE, RELOCATE OR RAISE OVERHEAD POWER LINES AT THIS INTERSECTION AS SHOWN. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH XCEL ACCORDINGLY. SEE UTILITIES SPECIFICATION FOR ADDITIONAL INFORMATION.

XCEL TO REMOVE, RELOCATE OR RAISE OVERHEAD POWER LINES AT THIS INTERSECTION AS SHOWN. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH XCEL ACCORDINGLY. SEE UTILITIES SPECIFICATION FOR ADDITIONAL INFORMATION.

XCEL TO REMOVE, RELOCATE OR RAISE OVERHEAD POWER LINES AT THIS INTERSECTION AS SHOWN. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH XCEL ACCORDINGLY. SEE UTILITIES SPECIFICATION FOR ADDITIONAL INFORMATION.

REPLACE EXISTING COMMUNICATIONS PULL BOX. EXISTING FIBER OPTIC LATERAL CABLE USES DIAGONAL SPAN WIRE TO REACH CABINET. NEW LATERAL CABLE AND SPLICE ARE REQUIRED FOR NEW CONSTRUCTION. SEE TELEMETRY NOTES.

EXIST. CONDUIT TO BE ABANDONED.

XCEL TO REMOVE, RELOCATE OR RAISE OVERHEAD POWER LINES AT THIS INTERSECTION AS SHOWN. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH XCEL ACCORDINGLY. SEE UTILITIES SPECIFICATION FOR ADDITIONAL INFORMATION.

EXISTING SOUTH LEG DETECTION (NOT SHOWN) TO BE ABANDONED

TELEMETRY NOTES:

1. REMOVE EXISTING AND INSTALL NEW PULL BOX (SPECIAL) ON SOUTHEAST CORNER FLUSH WITH PROPOSED FINISH GRADE. PROTECT AND MAINTAIN EXISTING FIBER OPTIC FACILITIES DURING PULL BOX CHANGE-OUT.
2. DISCONNECT FIBER OPTIC LATERALS FROM CONTROLLER CABINET. PATCH PANEL, PATCH CORDS, FIBER OPTIC MODEM, AND ALL ANCILLARY CONNECTORS AND OTHER COMMUNICATIONS-RELATED HARDWARE SHALL BE LIKewise REMOVED FROM EXISTING CABINET AND SALVAGED FOR DELIVERY TO CITY & COUNTY OF DENVER.
3. REMOVE EXISTING LATERAL CABLE BETWEEN SOUTHEAST CORNER PULL BOX AND CABINET. DISPOSE OF SAME AS PER THE APPLICABLE SECTIONS OF THE SPECIFICATIONS.
4. WORK REQUIRED DURING INSTALLATION STAGE WILL INCLUDE PROVIDING NEW LATERAL CABLE BETWEEN BACKBONE AND CONTROLLER IN UNDERGROUND CONDUIT, PROVIDING BACKBONE/LATERAL RE-SPLICE, AND RE-ESTABLISHING THE REQUIRED CONNECTIONS AND HARDWARE CONFIGURATION IN THE NEW CABINET INCLUDING NEW PATCH PANEL, PATCH CORDS, CONNECTORS AND OTHER COMMUNICATIONS-RELATED HARDWARE.
5. DURATION OF ALLOWED OUTAGE OF TRAFFIC SIGNAL COMMUNICATIONS SYSTEM AT THIS LOCATION WILL BE AS DETERMINED BY DENVER TRAFFIC ENGINEERING SERVICES (TES) DIVISION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH DENVER TES AT LEAST TWO WEEKS IN ADVANCE OF INTENDED START OF THE WORK AND SHALL NOTIFY THE ENGINEER OF ALL SUCH CORRESPONDENCE.
6. WORK SHALL BE PAID UNDER SECTION 614 - TELEMETRY (FIELD). SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	LUMP SUM	1

Print Date: 4/25/2012
 Drawing File Name: 04-signal_remove-Clay.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

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Sheet Revisions			
Date:	Comments	Init.	



Colorado Department of Transportation
 4670 N. Holly Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

As Constructed	No Revisions:
Revised:	
Void:	

**TRAFFIC SIGNAL PLAN
 ALAMEDA AVENUE & CLAY STREET
 REMOVAL PLAN**

Designer: SJS Structure Numbers: Sheet Subset: Subset Sheets: TR4 of TR26
 Detailer: JRM

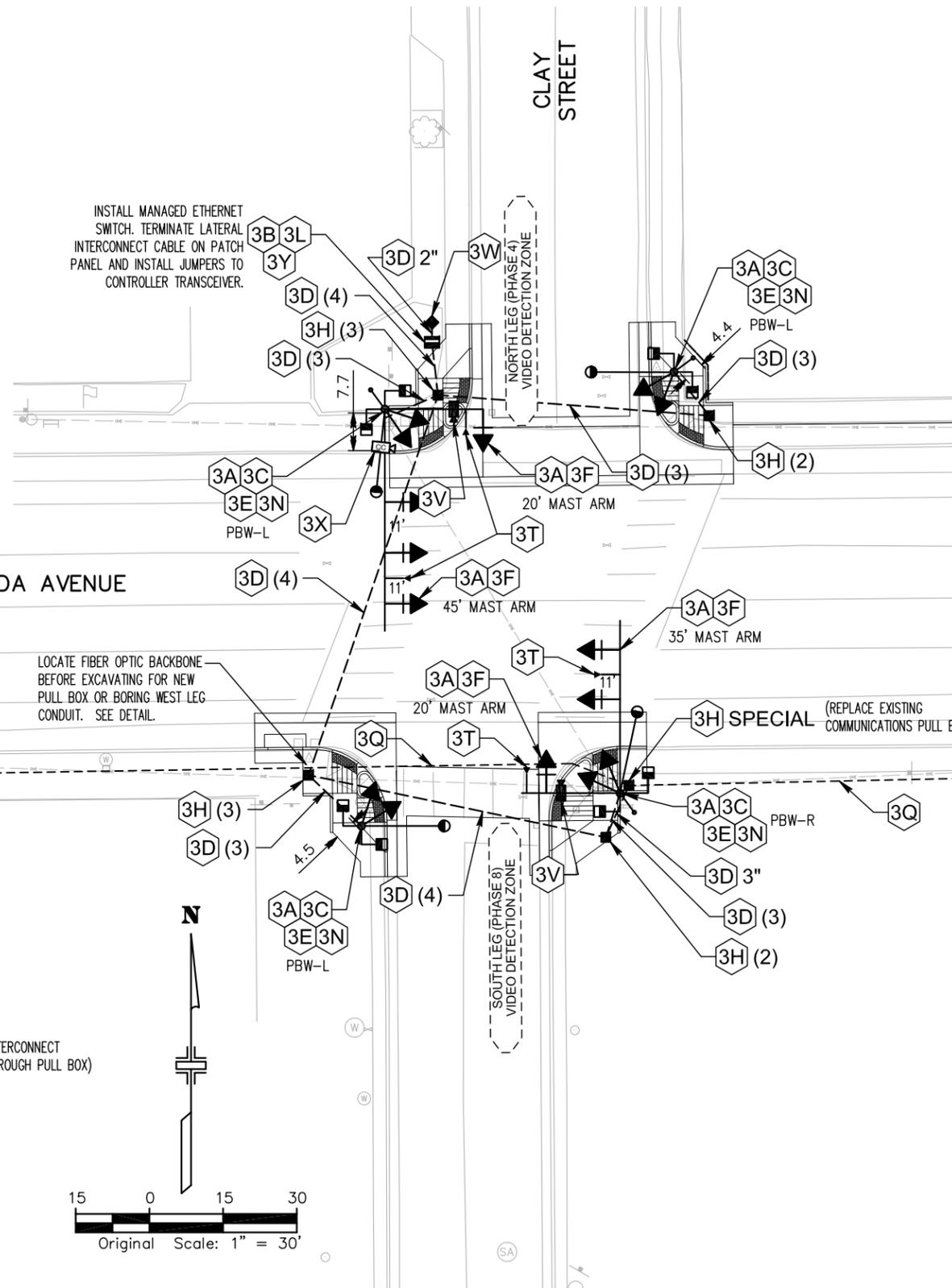
Project No./Code	SHE R600-391
	18197
Sheet Number	47

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INSTALLATION NOTES (ALAMEDA & CLAY):

- REMOVE EXISTING COMMUNICATIONS PULL BOX AND INSTALL NEW PULL BOX (SPECIAL) ON SOUTHEAST CORNER FLUSH WITH PROPOSED FINISH GRADE. PROTECT, MAINTAIN AND PRESERVE EXISTING BACKBONE CABLE CROSSING SOUTH INTERSECTION LEG THROUGHOUT THE DURATION OF CONSTRUCTION. FROM SOUTHEAST CORNER PULL BOX, BACKBONE RUNS UNINTERRUPTED TO FEDERAL IN EXISTING CONDUIT. NEW LATERAL CABLE CROSSES SOUTH AND WEST INTERSECTION LEGS TO PROPOSED CABINET VIA NEW CONDUIT.
- CONTRACTOR SHALL INSTALL NEW LATERAL CABLE FROM BACKBONE SPLICE BOX ON SOUTHEAST CORNER TO NEW CABINET. WORK INCLUDES NEW BACKBONE TO LATERAL FIBER OPTIC CABLE SPLICE. NEW CABLE, CABLE TESTING, ALL CABLE PREPARATION TREATMENTS FOR SPLICING, THE SPLICE ITSELF, SPLICE ENCLOSURE, AND ALL ANCILLARY COMMUNICATIONS SYSTEM WORK EXTERNAL TO THE CABINET SHALL BE CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
- MAJORITY OF IN-CABINET COMMUNICATIONS HARDWARE ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THIS INCLUDES BUT IS NOT LIMITED TO: NEW WALL-MOUNTED PATCH PANEL; NEW PATCH CORDS; NEW CONNECTORS, STRAIN RELIEF, CABLE TIES, HARNESSES AND ALL OTHER ANCILLARY IN-CABINET EQUIPMENT. NEW ETHERNET SWITCH SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR. COST FOR ALL IN-CABINET SYSTEM COMMUNICATIONS EQUIPMENT; CABLE TERMINATION; AND CONNECTION OF ALL LATERAL CABLE, PATCH CORDS AND OTHER REQUIRED CONNECTIONS INSIDE THE CABINET IS CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
- PROVIDE 12-BULKHEAD PATCH PANEL INSIDE ALAMEDA & CLAY CABINET.
- NEW CABINET, CONTROLLER AND PRE-CAST CABINET BASE SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR.

INSTALL MANAGED ETHERNET SWITCH. TERMINATE LATERAL INTERCONNECT CABLE ON PATCH PANEL AND INSTALL JUMPERS TO CONTROLLER TRANSCEIVER.

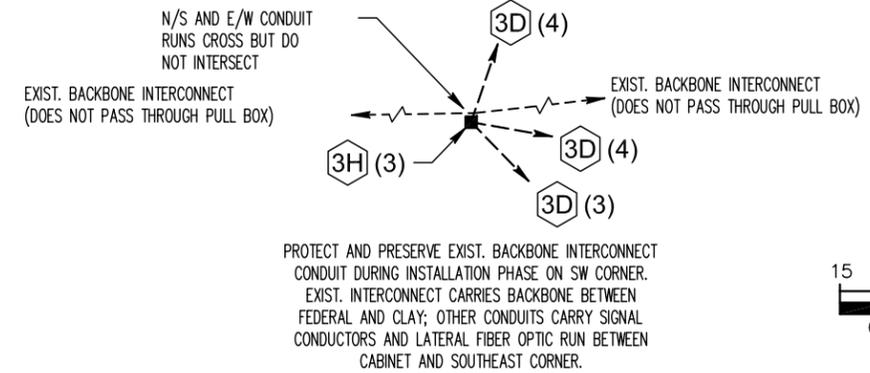


LOCATE FIBER OPTIC BACKBONE BEFORE EXCAVATING FOR NEW PULL BOX OR BORING WEST LEG CONDUIT. SEE DETAIL.

EXISTING INTERCONNECT CONDUIT TO FEDERAL

EXISTING INTERCONNECT CONDUIT TO ZUNI

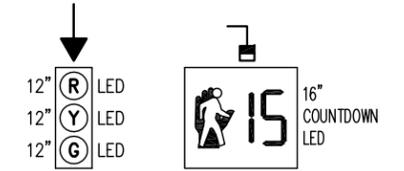
SW CORNER DETAIL



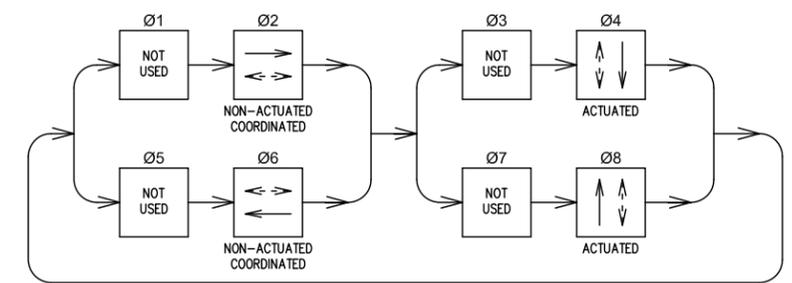
SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
503	DRILLED CAISSON (36 INCH)	LIN. FEET	32
613	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	260
613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	675
■ 613	PULL BOX (SPECIAL)	EACH	3
613	WIRING	LUMP SUM	1
613	ELECTRIC METER PEDESTAL CABINET AND BASE	EACH	1
614	PEDESTRIAN SIGNAL FACE (16) (COUNTDOWN)	EACH	8
614	TRAFFIC SIGNAL FACE (12-12-12)	EACH	14
614	TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)	EACH	1
614	FIRE PREEMPTION UNIT AND TIMER	EACH	1
614	INTERSECTION DETECTION SYSTEM (CAMERA)	EACH	2
614	PEDESTRIAN PUSH BUTTON	EACH	4
● 614	TRAFFIC SIGNAL LIGHT POLE STEEL	EACH	2
614	TRAFFIC SIGNAL LIGHT POLE STEEL (2 MAST ARM)	EACH	2
614	TELEMETRY (FIELD)	EACH	1
614	CLOSED CIRCUIT TELEVISION	EACH	1

- TYPE A PULL BOXES FOR STREET LIGHTING INCLUDED IN COST OF CONDUIT AND WILL NOT BE MEASURED AND PAID SEPARATELY.
- INCLUDES PRE-CAST FOOTING

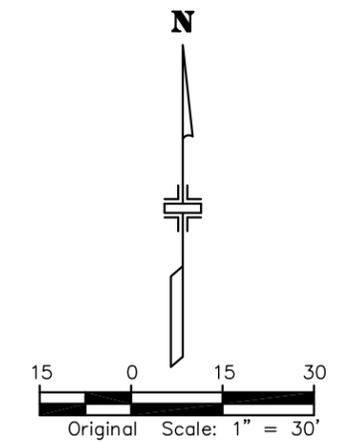
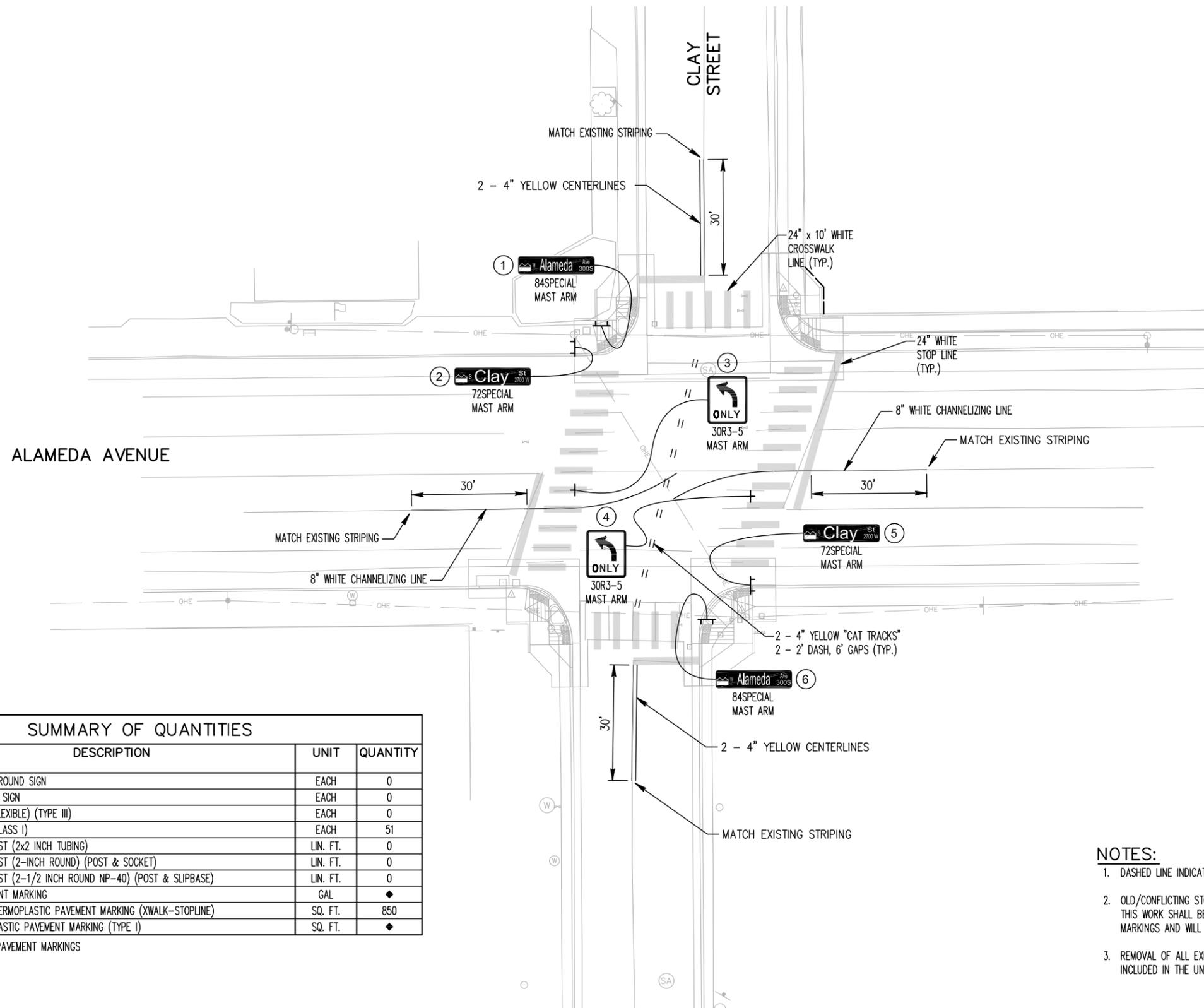
SIGNAL HEAD SCHEDULE



PROPOSED PHASING



Print Date: 7/11/2012	Sheet Revisions Date: Comments Init. 	Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed	TRAFFIC SIGNAL PLAN ALAMEDA AVENUE & CLAY STREET INSTALLATION PLAN		Project No./Code
Drawing File Name: 05-signal_install-clay.dgn			No Revisions:			SHE R600-391
Horiz. Scale: 1:30 Vert. Scale: As Noted			Revised:	Designer: SJS	Structure:	18197
Unit Information Unit Leader Initials			Void:	Detailer: JRM	Numbers:	Sheet Number 48
5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250				Sheet Subset:	Subset Sheets: TR5 of TR26	



SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF GROUND SIGN	EACH	0
210	RESET GROUND SIGN	EACH	0
612	DELINEATOR (FLEXIBLE) (TYPE III)	EACH	0
614	SIGN PANEL (CLASS I)	EACH	51
614	STEEL SIGN POST (2x2 INCH TUBING)	LIN. FT.	0
614	STEEL SIGN POST (2-INCH ROUND) (POST & SOCKET)	LIN. FT.	0
614	STEEL SIGN POST (2-1/2 INCH ROUND NP-40) (POST & SLIPBASE)	LIN. FT.	0
627	EPOXY PAVEMENT MARKING	GAL	◆
627	PREFORMED THERMOPLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SQ. FT.	850
627	PREFORMED PLASTIC PAVEMENT MARKING (TYPE I)	SQ. FT.	◆

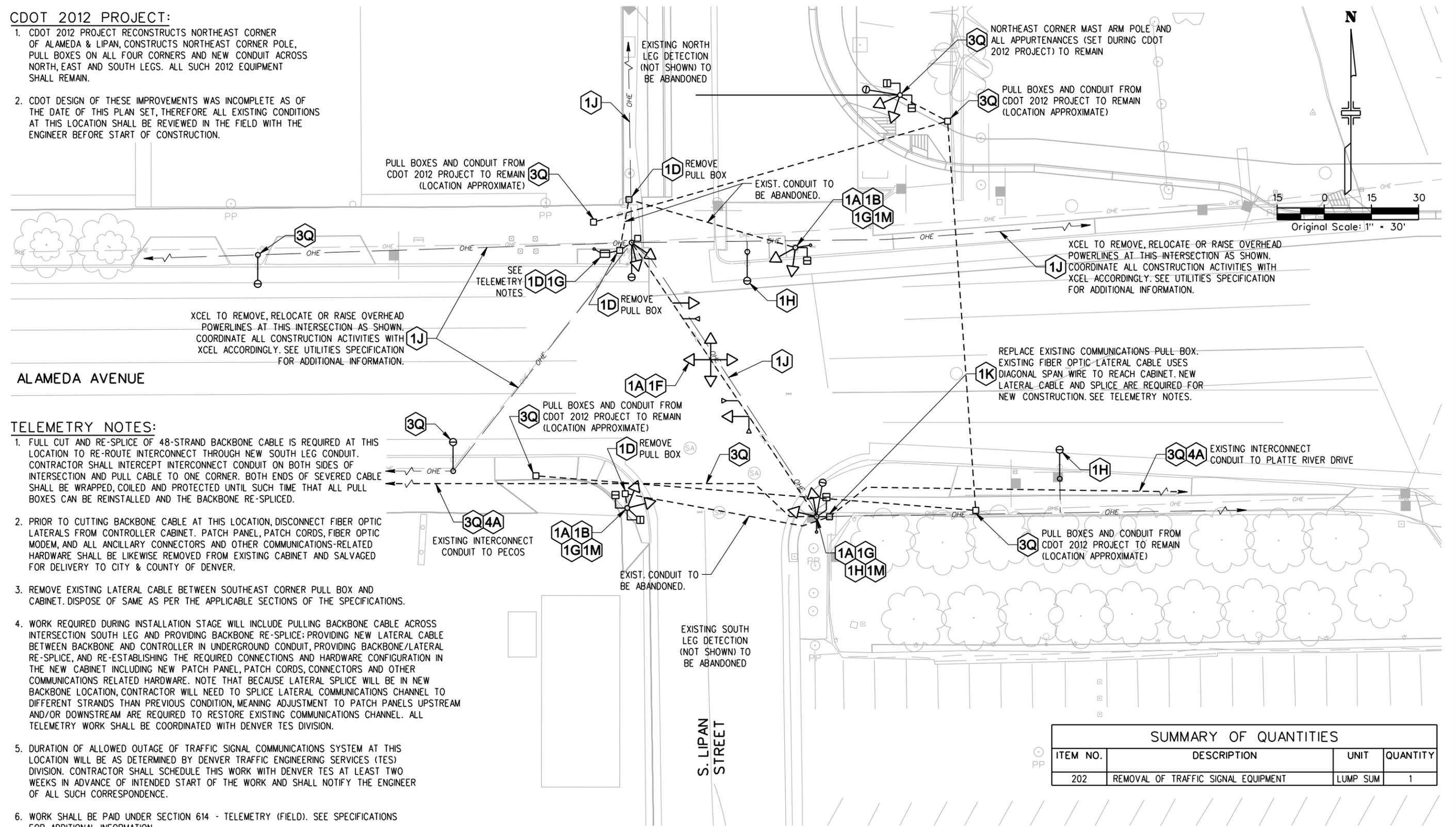
◆ REFER TO TABULATION OF PAVEMENT MARKINGS

- NOTES:**
- DASHED LINE INDICATES EXISTING STRIPING TO REMAIN.
 - OLD/CONFLICTING STOP BARS AND CROSSWALK LINES SHALL BE REMOVED. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE COST OF NEW PAVEMENT MARKINGS AND WILL NOT BE MEASURED AND PAID SEPARATELY.
 - REMOVAL OF ALL EXISTING TRAFFIC SIGNAL MOUNTED SIGN PANELS IS INCLUDED IN THE UNIT COST FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.

Print Date: 7/11/2012 Drawing File Name: 06-sign_stripe-Clay.dgn Horiz. Scale: 1:30 Vert. Scale: As Noted Unit Information Unit Leader Initials	Sheet Revisions Date: Comments Init.			 DENVER THE MILE HIGH CITY	 Colorado Department of Transportation 4670 N. Holly 80216 Denver, CO Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed No Revisions:		TRAFFIC SIGNAL PLAN ALAMEDA AVENUE & CLAY STREET SIGNING & STRIPING PLAN		Project No./Code SHE R600-391	
	 CENTENNIAL ENGINEERING, INC. 5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250						Revised:	Designer: SJS Detailer: JRM	Structure:	Numbers:	18197

CDOT 2012 PROJECT:

1. CDOT 2012 PROJECT RECONSTRUCTS NORTHEAST CORNER OF ALAMEDA & LIPAN, CONSTRUCTS NORTHEAST CORNER POLE, PULL BOXES ON ALL FOUR CORNERS AND NEW CONDUIT ACROSS NORTH, EAST AND SOUTH LEGS. ALL SUCH 2012 EQUIPMENT SHALL REMAIN.
2. CDOT DESIGN OF THESE IMPROVEMENTS WAS INCOMPLETE AS OF THE DATE OF THIS PLAN SET, THEREFORE ALL EXISTING CONDITIONS AT THIS LOCATION SHALL BE REVIEWED IN THE FIELD WITH THE ENGINEER BEFORE START OF CONSTRUCTION.



XCEL TO REMOVE, RELOCATE OR RAISE OVERHEAD POWERLINES AT THIS INTERSECTION AS SHOWN. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH XCEL ACCORDINGLY. SEE UTILITIES SPECIFICATION FOR ADDITIONAL INFORMATION.

XCEL TO REMOVE, RELOCATE OR RAISE OVERHEAD POWERLINES AT THIS INTERSECTION AS SHOWN. COORDINATE ALL CONSTRUCTION ACTIVITIES WITH XCEL ACCORDINGLY. SEE UTILITIES SPECIFICATION FOR ADDITIONAL INFORMATION.

REPLACE EXISTING COMMUNICATIONS PULL BOX. EXISTING FIBER OPTIC LATERAL CABLE USES DIAGONAL SPAN WIRE TO REACH CABINET. NEW LATERAL CABLE AND SPLICE ARE REQUIRED FOR NEW CONSTRUCTION. SEE TELEMETRY NOTES.

TELEMETRY NOTES:

1. FULL CUT AND RE-SPLICE OF 48-STRAND BACKBONE CABLE IS REQUIRED AT THIS LOCATION TO RE-ROUTE INTERCONNECT THROUGH NEW SOUTH LEG CONDUIT. CONTRACTOR SHALL INTERCEPT INTERCONNECT CONDUIT ON BOTH SIDES OF INTERSECTION AND PULL CABLE TO ONE CORNER. BOTH ENDS OF SEVERED CABLE SHALL BE WRAPPED, COILED AND PROTECTED UNTIL SUCH TIME THAT ALL PULL BOXES CAN BE REINSTALLED AND THE BACKBONE RE-SPLICED.
2. PRIOR TO CUTTING BACKBONE CABLE AT THIS LOCATION, DISCONNECT FIBER OPTIC LATERALS FROM CONTROLLER CABINET. PATCH PANEL, PATCH CORDS, FIBER OPTIC MODEM, AND ALL ANCILLARY CONNECTORS AND OTHER COMMUNICATIONS-RELATED HARDWARE SHALL BE LIKEWISE REMOVED FROM EXISTING CABINET AND SALVAGED FOR DELIVERY TO CITY & COUNTY OF DENVER.
3. REMOVE EXISTING LATERAL CABLE BETWEEN SOUTHEAST CORNER PULL BOX AND CABINET. DISPOSE OF SAME AS PER THE APPLICABLE SECTIONS OF THE SPECIFICATIONS.
4. WORK REQUIRED DURING INSTALLATION STAGE WILL INCLUDE PULLING BACKBONE CABLE ACROSS INTERSECTION SOUTH LEG AND PROVIDING BACKBONE RE-SPLICE; PROVIDING NEW LATERAL CABLE BETWEEN BACKBONE AND CONTROLLER IN UNDERGROUND CONDUIT, PROVIDING BACKBONE/LATERAL RE-SPLICE, AND RE-ESTABLISHING THE REQUIRED CONNECTIONS AND HARDWARE CONFIGURATION IN THE NEW CABINET INCLUDING NEW PATCH PANEL, PATCH CORDS, CONNECTORS AND OTHER COMMUNICATIONS RELATED HARDWARE. NOTE THAT BECAUSE LATERAL SPLICE WILL BE IN NEW BACKBONE LOCATION, CONTRACTOR WILL NEED TO SPLICE LATERAL COMMUNICATIONS CHANNEL TO DIFFERENT STRANDS THAN PREVIOUS CONDITION, MEANING ADJUSTMENT TO PATCH PANELS UPSTREAM AND/OR DOWNSTREAM ARE REQUIRED TO RESTORE EXISTING COMMUNICATIONS CHANNEL. ALL TELEMETRY WORK SHALL BE COORDINATED WITH DENVER TES DIVISION.
5. DURATION OF ALLOWED OUTAGE OF TRAFFIC SIGNAL COMMUNICATIONS SYSTEM AT THIS LOCATION WILL BE AS DETERMINED BY DENVER TRAFFIC ENGINEERING SERVICES (TES) DIVISION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH DENVER TES AT LEAST TWO WEEKS IN ADVANCE OF INTENDED START OF THE WORK AND SHALL NOTIFY THE ENGINEER OF ALL SUCH CORRESPONDENCE.
6. WORK SHALL BE PAID UNDER SECTION 614 - TELEMETRY (FIELD). SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	LUMP SUM	1

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Print Date: 4/25/2012
 Drawing File Name: 07-signal_remove-lipan.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

5420 Ward Road, Suite 125
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 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 4670 N. Holly Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

DENVER
 THE MILE HIGH CITY

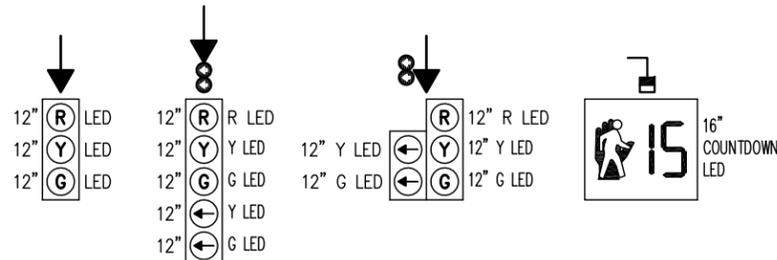
As Constructed
 No Revisions:
 Revised:
 Void:

**TRAFFIC SIGNAL PLAN
 ALAMEDA AVENUE & LIPAN STREET
 REMOVAL PLAN**

Designer: SJS Structure Numbers:
 Detailer: JRM
 Sheet Subset: Subset Sheets: TR7 of TR26

Project No./Code
 SHE R600-391
 18197
 Sheet Number 50

SIGNAL HEAD SCHEDULE



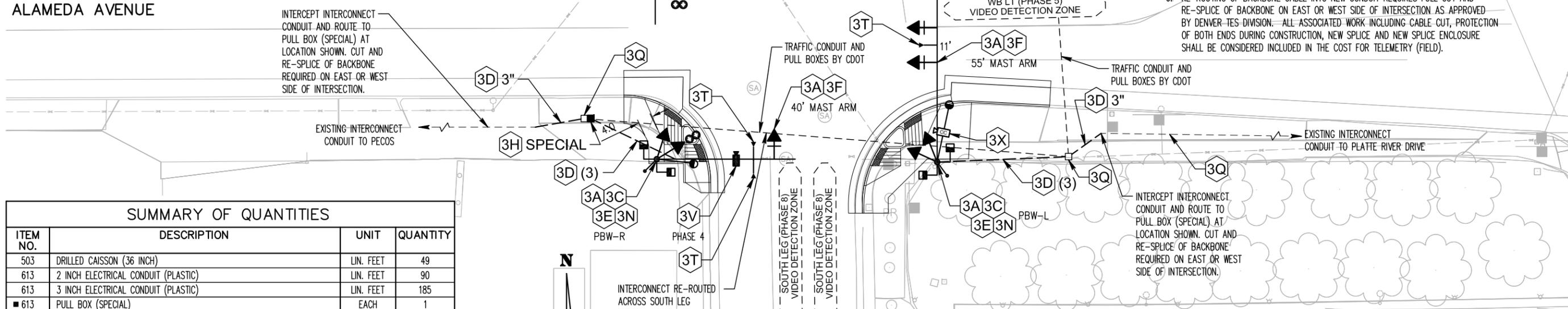
CDOT ALAMEDA BRIDGE PROJECT

EXISTING TRAFFIC SIGNAL POLES AND INDICATIONS AT THE NORTHEAST CORNER OF ALAMEDA AND LIPAN SHALL BE REMOVE BY CDOT AS PART OF THE CDOT ALAMEDA BRIDGE PROJECT. CDOT WILL REBUILD THE NORTHEAST CORNER INTERSECTION AS SHOWN ON THIS PLAN AND INSTALL NEW TRAFFIC SIGNAL POLE, MAST ARM AND TEMPORARY SIGNAL INDICATION ON THE NEW SIGNAL POLE. THE CITY SIGNAL CONTRACTOR SHALL INSTALL NEW PERMANENT SIGNAL INDICATIONS AS SHOWN ON THIS PLAN. CONTACT JOHN YU WITH TES AT 720-865-3176 FOR DETAILS PRIOR TO BEGIN CONSTRUCTION.

NORTHEAST CORNER NOTES:

- CDOT 2012 PROJECT INSTALLS POLE, LUMINAIRE, TWO POLE-MOUNT SIGNAL HEADS, ONE PEDESTRIAN HEAD AND ONE PEDESTRIAN PUSH BUTTON ON NORTHEAST CORNER. VERIFY ALL EQUIPMENT IS IN PLACE PRIOR TO STARTING WORK.
- INSTALL NEW CABINET AND ELECTRIC METER ASSEMBLY ON NORTHEAST CORNER IN A LOCATION APPROVED BY THE ENGINEER. ROUTE LATERAL INTERCONNECT CABLE FROM SOUTHWEST CORNER PULL BOX TO CABINET USING EAST INTERSECTION LEG IN CONDUIT INSTALLED IN 2012 CDOT PROJECT.

ALAMEDA AVENUE



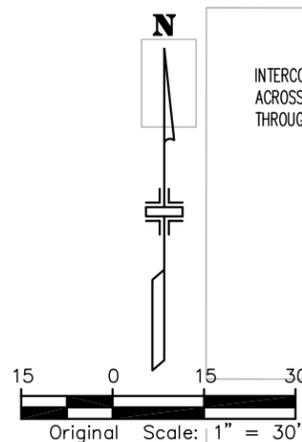
INSTALLATION NOTES (ALAMEDA & LIPAN):

- INSTALL NEW PULL BOX (SPECIAL) ON SOUTHWEST CORNER FLUSH WITH PROPOSED FINISH GRADE. PROTECT, MAINTAIN AND PRESERVE EXISTING BACKBONE CABLE CROSSING SOUTH INTERSECTION LEG THROUGHOUT THE DURATION OF CONSTRUCTION. FOLLOWING CONSTRUCTION, FROM SOUTHWEST CORNER PULL BOX, BACKBONE RUNS UNINTERRUPTED TO PECOS IN EXISTING CONDUIT; NEW LATERAL CABLE CROSSES EAST INTERSECTION LEG TO PROPOSED CABINET VIA NEW CONDUIT.
- CONTRACTOR SHALL INSTALL NEW LATERAL CABLE FROM BACKBONE SPLICE BOX ON SOUTHWEST CORNER TO NEW CABINET. WORK INCLUDES NEW BACKBONE TO LATERAL FIBER OPTIC CABLE SPLICE. NEW CABLE, CABLE TESTING, ALL CABLE PREPARATION TREATMENTS FOR SPLICING, THE SPLICE ITSELF, SPLICE ENCLOSURE, AND ALL ANCILLARY COMMUNICATIONS SYSTEM WORK EXTERNAL TO THE CABINET SHALL BE CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
- MAJORITY OF IN-CABINET COMMUNICATIONS HARDWARE ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THIS INCLUDES BUT IS NOT LIMITED TO: NEW WALL-MOUNTED PATCH PANEL; NEW PATCH CORDS; NEW CONNECTORS; STRAIN RELIEF, CABLE TIES, HARNESSES AND ALL OTHER ANCILLARY IN-CABINET EQUIPMENT. NEW ETHERNET SWITCH SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR. COST FOR ALL IN-CABINET SYSTEM COMMUNICATIONS EQUIPMENT; CABLE TERMINATION; AND CONNECTION OF ALL LATERAL CABLE, PATCH CORDS AND OTHER REQUIRED CONNECTIONS INSIDE THE CABINET IS CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
- PROVIDE 12-BULKHEAD PATCH PANEL INSIDE ALAMEDA & LIPAN CABINET.
- NEW CABINET, CONTROLLER AND PRE-CAST CABINET BASE TO BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR.
- RE-ROUTING OF BACKBONE CABLE INTO NEW CONDUIT REQUIRES FULL CUT AND RE-SPLICE OF BACKBONE ON EAST OR WEST SIDE OF INTERSECTION AS APPROVED BY DENVER TES DIVISION. ALL ASSOCIATED WORK INCLUDING CABLE CUT, PROTECTION OF BOTH ENDS DURING CONSTRUCTION, NEW SPLICE AND NEW SPLICE ENCLOSURE SHALL BE CONSIDERED INCLUDED IN THE COST FOR TELEMETRY (FIELD).

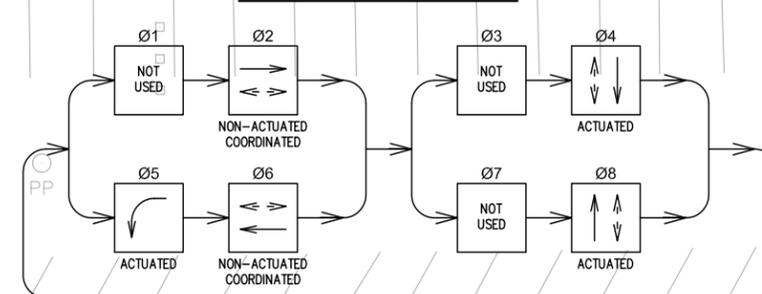
SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
503	DRILLED CAISSON (36 INCH)	LIN. FEET	49
613	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	90
613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	185
■ 613	PULL BOX (SPECIAL)	EACH	1
613	WIRING	LUMP SUM	1
613	ELECTRIC METER PEDESTAL CABINET AND BASE	EACH	1
614	PEDESTRIAN SIGNAL FACE (16) (COUNTDOWN)	EACH	6
614	TRAFFIC SIGNAL FACE (12-12-12)	EACH	12
614	TRAFFIC SIGNAL FACE (12-12-12-12)	EACH	2
614	TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)	EACH	1
614	FIRE PREEMPTION UNIT AND TIMER	EACH	1
614	INTERSECTION DETECTION SYSTEM (CAMERA)	EACH	3
614	PEDESTRIAN PUSH BUTTON	EACH	3
614	TRAFFIC SIGNAL-LIGHT POLE STEEL (1 MAST ARM)	EACH	3
614	TELEMETRY (FIELD)	EACH	1
614	CLOSED CIRCUIT TELEVISION	EACH	1

■ TYPE A PULL BOXES FOR STREET LIGHTING INCLUDED IN COST OF CONDUIT AND WILL NOT BE MEASURED AND PAID SEPARATELY.



PROPOSED PHASING



Print Date: 7/11/2012
 Drawing File Name: 08-signal_install-lipan.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials
CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.

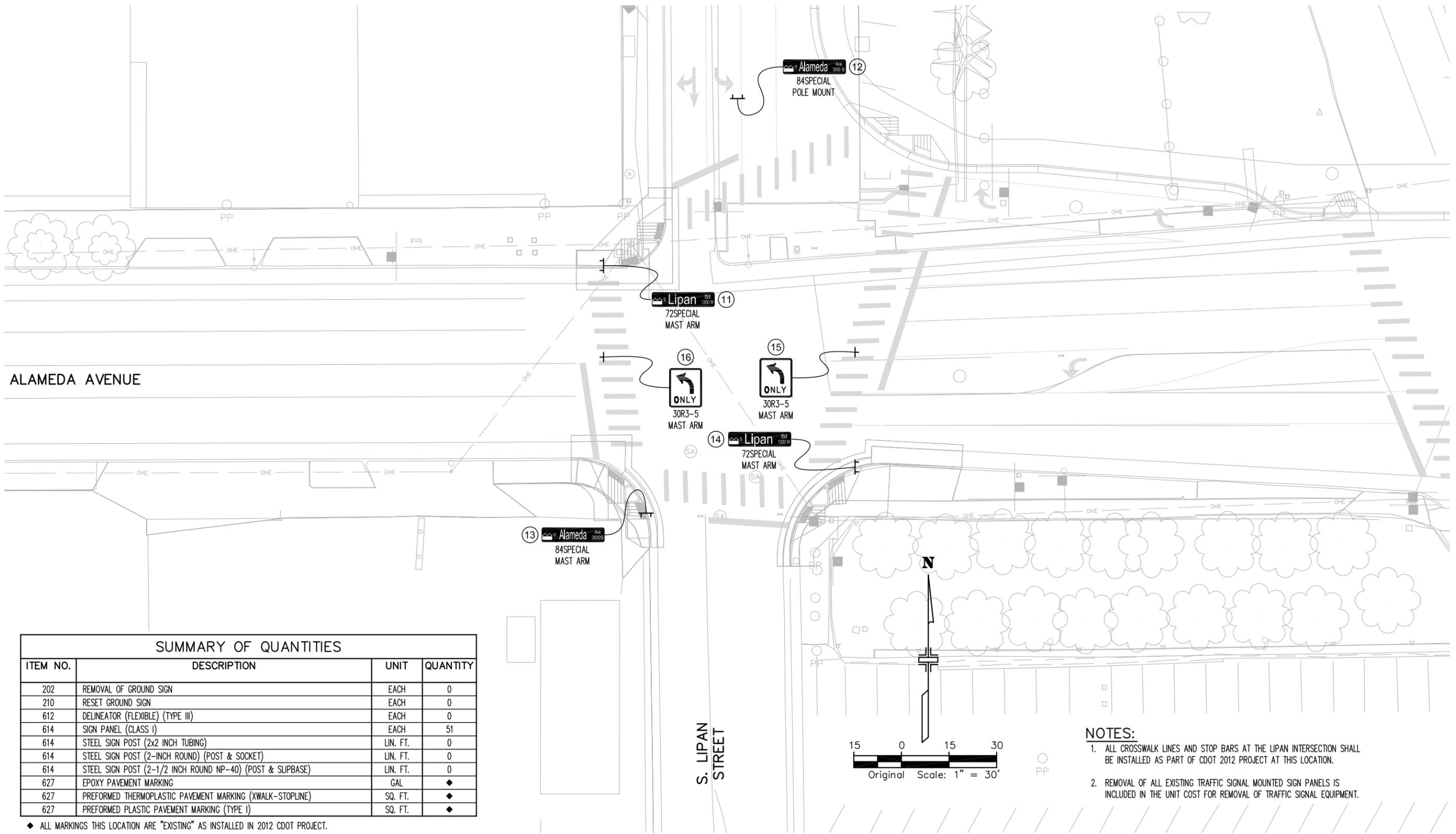
Colorado Department of Transportation
 Region 6
 4670 N. Holly
 Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781

As Constructed
 No Revisions:
 Revised:
 Void:

**TRAFFIC SIGNAL PLAN
 ALAMEDA AVENUE & LIPAN STREET
 INSTALLATION PLAN**

Designer: SJS Structure
 Detailer: JRM Numbers
 Sheet Subset: Subset Sheets: TR8 of TR26

Project No./Code
 SHE R600-391
 18197
 Sheet Number 51



SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF GROUND SIGN	EACH	0
210	RESET GROUND SIGN	EACH	0
612	DELINEATOR (FLEXIBLE) (TYPE III)	EACH	0
614	SIGN PANEL (CLASS I)	EACH	51
614	STEEL SIGN POST (2x2 INCH TUBING)	LIN. FT.	0
614	STEEL SIGN POST (2-INCH ROUND) (POST & SOCKET)	LIN. FT.	0
614	STEEL SIGN POST (2-1/2 INCH ROUND NP-40) (POST & SLIPBASE)	LIN. FT.	0
627	EPOXY PAVEMENT MARKING	GAL	◆
627	PREFORMED THERMOPLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SQ. FT.	◆
627	PREFORMED PLASTIC PAVEMENT MARKING (TYPE I)	SQ. FT.	◆

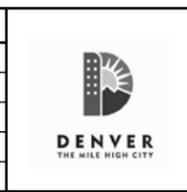
◆ ALL MARKINGS THIS LOCATION ARE "EXISTING" AS INSTALLED IN 2012 CDOT PROJECT.

NOTES:

1. ALL CROSSWALK LINES AND STOP BARS AT THE LIPAN INTERSECTION SHALL BE INSTALLED AS PART OF CDOT 2012 PROJECT AT THIS LOCATION.
2. REMOVAL OF ALL EXISTING TRAFFIC SIGNAL MOUNTED SIGN PANELS IS INCLUDED IN THE UNIT COST FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.

Print Date: 7/11/2012
 Drawing File Name: 09-sig_n_stripe-lipan.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials
CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.



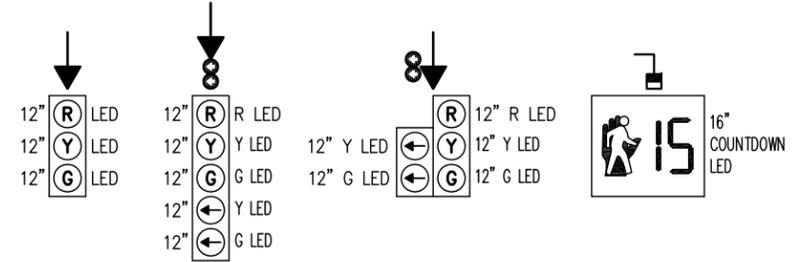
Colorado Department of Transportation
 4670 N. Holly
 Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

As Constructed
 No Revisions:
 Revised:
 Void:

**TRAFFIC SIGNAL PLAN
 ALAMEDA AVENUE & LIPAN STREET
 SIGNING & STRIPING PLAN**
 Designer: SJS
 Detailer: JRM
 Sheet Subset:
 Structure Numbers
 Subset Sheets: TR9 of TR26

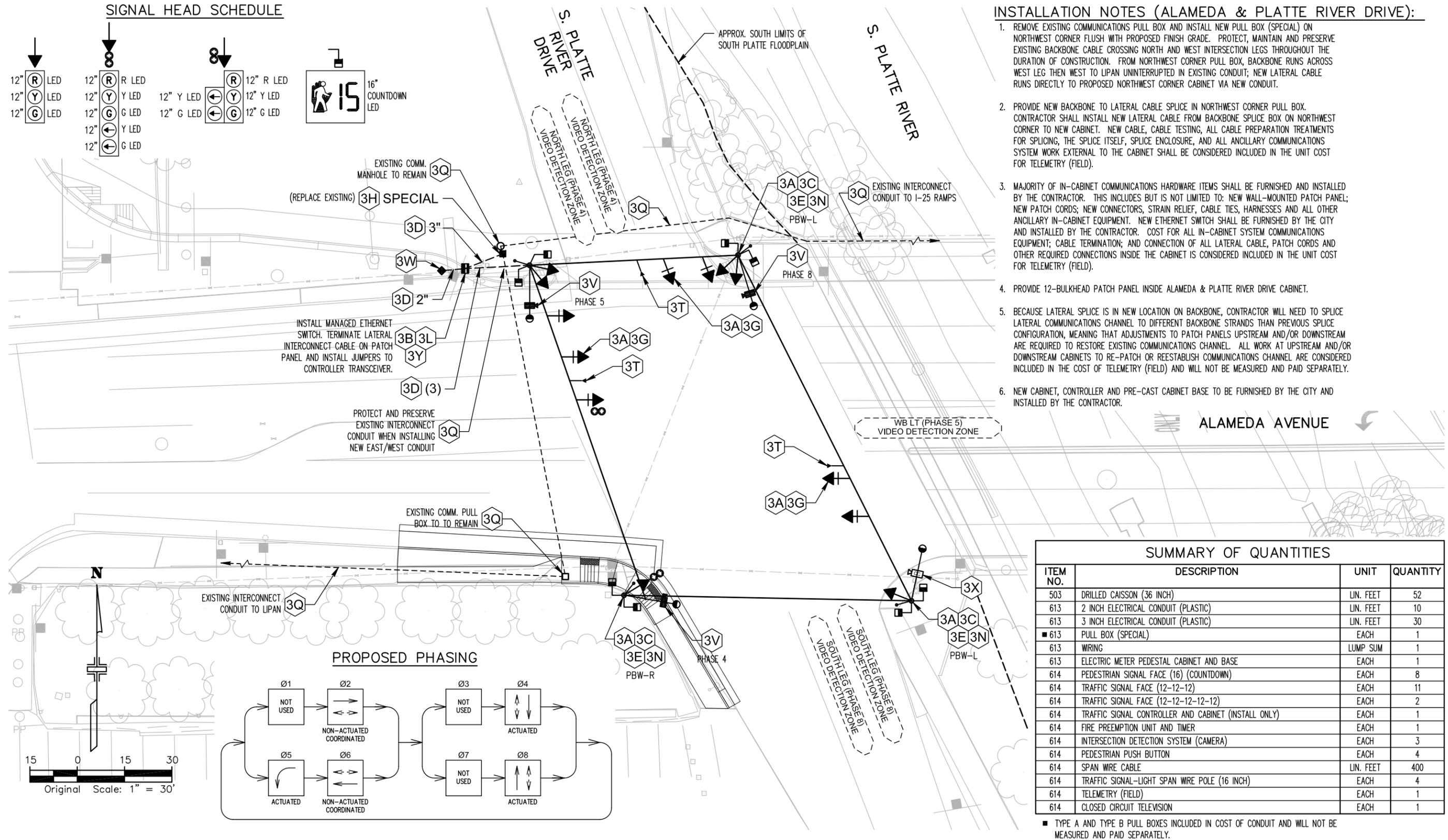
Project No./Code
 SHE R600-391
 18197
 Sheet Number 52

SIGNAL HEAD SCHEDULE



INSTALLATION NOTES (ALAMEDA & PLATTE RIVER DRIVE):

1. REMOVE EXISTING COMMUNICATIONS PULL BOX AND INSTALL NEW PULL BOX (SPECIAL) ON NORTHWEST CORNER FLUSH WITH PROPOSED FINISH GRADE. PROTECT, MAINTAIN AND PRESERVE EXISTING BACKBONE CABLE CROSSING NORTH AND WEST INTERSECTION LEGS THROUGHOUT THE DURATION OF CONSTRUCTION. FROM NORTHWEST CORNER PULL BOX, BACKBONE RUNS ACROSS WEST LEG THEN WEST TO LIPAN UNINTERRUPTED IN EXISTING CONDUIT; NEW LATERAL CABLE RUNS DIRECTLY TO PROPOSED NORTHWEST CORNER CABINET VIA NEW CONDUIT.
2. PROVIDE NEW BACKBONE TO LATERAL CABLE SPLICE IN NORTHWEST CORNER PULL BOX. CONTRACTOR SHALL INSTALL NEW LATERAL CABLE FROM BACKBONE SPLICE BOX ON NORTHWEST CORNER TO NEW CABINET. NEW CABLE, CABLE TESTING, ALL CABLE PREPARATION TREATMENTS FOR SPLICING, THE SPLICE ITSELF, SPLICE ENCLOSURE, AND ALL ANCILLARY COMMUNICATIONS SYSTEM WORK EXTERNAL TO THE CABINET SHALL BE CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
3. MAJORITY OF IN-CABINET COMMUNICATIONS HARDWARE ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THIS INCLUDES BUT IS NOT LIMITED TO: NEW WALL-MOUNTED PATCH PANEL; NEW PATCH CORDS; NEW CONNECTORS, STRAIN RELIEF, CABLE TIES, HARNESSES AND ALL OTHER ANCILLARY IN-CABINET EQUIPMENT. NEW ETHERNET SWITCH SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR. COST FOR ALL IN-CABINET SYSTEM COMMUNICATIONS EQUIPMENT; CABLE TERMINATION; AND CONNECTION OF ALL LATERAL CABLE, PATCH CORDS AND OTHER REQUIRED CONNECTIONS INSIDE THE CABINET IS CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
4. PROVIDE 12-BULKHEAD PATCH PANEL INSIDE ALAMEDA & PLATTE RIVER DRIVE CABINET.
5. BECAUSE LATERAL SPLICE IS IN NEW LOCATION ON BACKBONE, CONTRACTOR WILL NEED TO SPLICE LATERAL COMMUNICATIONS CHANNEL TO DIFFERENT BACKBONE STRANDS THAN PREVIOUS SPLICE CONFIGURATION, MEANING THAT ADJUSTMENTS TO PATCH PANELS UPSTREAM AND/OR DOWNSTREAM ARE REQUIRED TO RESTORE EXISTING COMMUNICATIONS CHANNEL. ALL WORK AT UPSTREAM AND/OR DOWNSTREAM CABINETS TO RE-PATCH OR REESTABLISH COMMUNICATIONS CHANNEL ARE CONSIDERED INCLUDED IN THE COST OF TELEMETRY (FIELD) AND WILL NOT BE MEASURED AND PAID SEPARATELY.
6. NEW CABINET, CONTROLLER AND PRE-CAST CABINET BASE TO BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR.



SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
503	DRILLED CAISSON (36 INCH)	LIN. FEET	52
613	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	10
613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	30
■ 613	PULL BOX (SPECIAL)	EACH	1
613	WIRING	LUMP SUM	1
613	ELECTRIC METER PEDESTAL CABINET AND BASE	EACH	1
614	PEDESTRIAN SIGNAL FACE (16) (COUNTDOWN)	EACH	8
614	TRAFFIC SIGNAL FACE (12-12-12)	EACH	11
614	TRAFFIC SIGNAL FACE (12-12-12-12-12)	EACH	2
614	TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)	EACH	1
614	FIRE PREEMPTION UNIT AND TIMER	EACH	1
614	INTERSECTION DETECTION SYSTEM (CAMERA)	EACH	3
614	PEDESTRIAN PUSH BUTTON	EACH	4
614	SPAN WIRE CABLE	LIN. FEET	400
614	TRAFFIC SIGNAL-LIGHT SPAN WIRE POLE (16 INCH)	EACH	4
614	TELEMETRY (FIELD)	EACH	1
614	CLOSED CIRCUIT TELEVISION	EACH	1

■ TYPE A AND TYPE B PULL BOXES INCLUDED IN COST OF CONDUIT AND WILL NOT BE MEASURED AND PAID SEPARATELY.

Print Date: 7/11/2012
 Drawing File Name: 11-signal_install-platte.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 Region 6
 4670 N. Holly
 Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781

As Constructed
 No Revisions:
 Revised:
 Void:

**TRAFFIC SIGNAL PLAN
 ALAMEDA AVE. & PLATTE RIVER DRIVE
 INSTALLATION PLAN**

Designer: SJS Structure
 Detailer: JRM Numbers
 Sheet Subset: Subset Sheets: TR11 of TR26

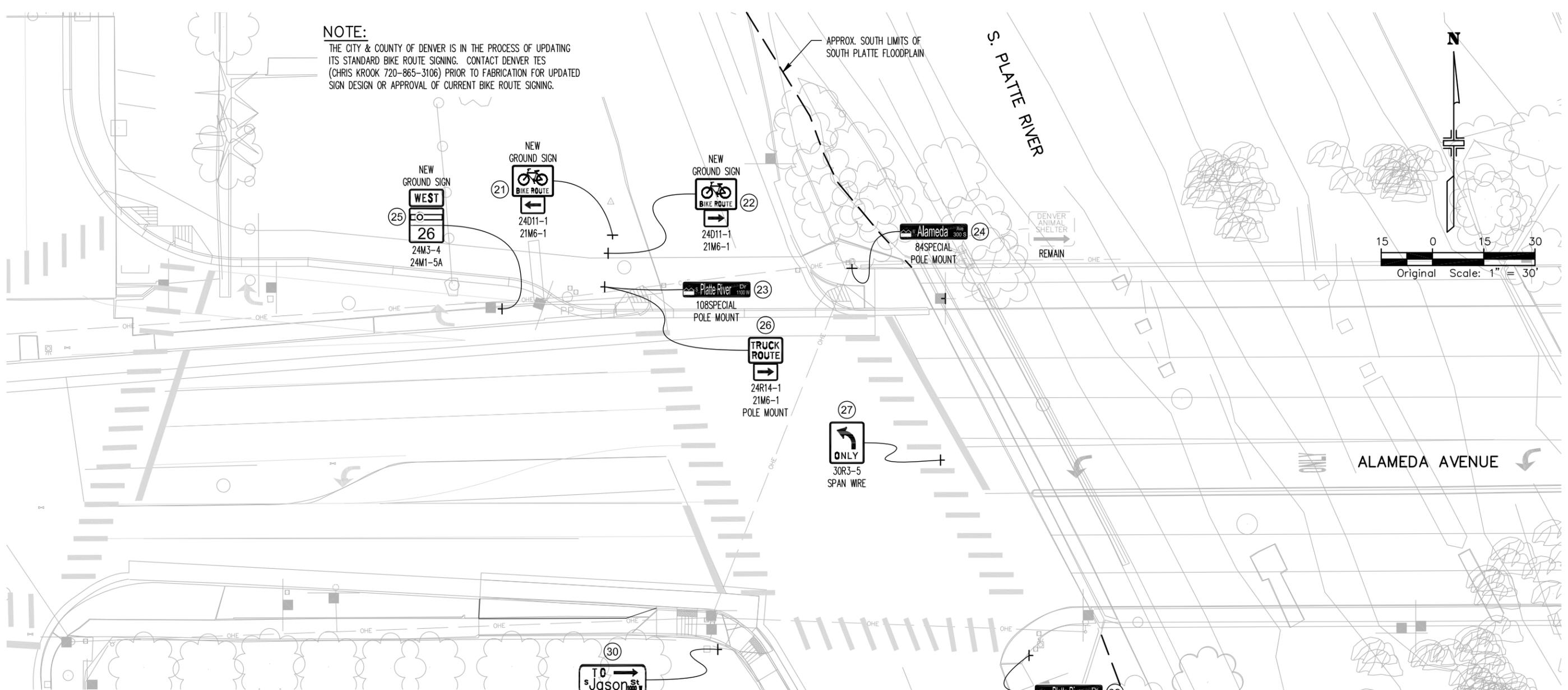
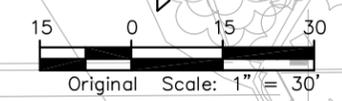
Project No./Code
 SHE R600-391
 18197
 Sheet Number 54

NOTE:
 THE CITY & COUNTY OF DENVER IS IN THE PROCESS OF UPDATING ITS STANDARD BIKE ROUTE SIGNING. CONTACT DENVER TES (CHRIS KROOK 720-865-3106) PRIOR TO FABRICATION FOR UPDATED SIGN DESIGN OR APPROVAL OF CURRENT BIKE ROUTE SIGNING.

APPROX. SOUTH LIMITS OF SOUTH PLATTE FLOODPLAIN

S. PLATTE RIVER

N



SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF GROUND SIGN	EACH	0
210	RESET GROUND SIGN	EACH	0
612	DELINEATOR (FLEXIBLE) (TYPE III)	EACH	0
614	SIGN PANEL (CLASS I)	EACH	74.525
614	STEEL SIGN POST (2x2 INCH TUBING)	LIN. FT.	35.5
614	STEEL SIGN POST (2-INCH ROUND) (POST & SOCKET)	LIN. FT.	0
614	STEEL SIGN POST (2-1/2 INCH ROUND NP-40) (POST & SLIPBASE)	LIN. FT.	0
627	EPOXY PAVEMENT MARKING	GAL	◆
627	PREFORMED THERMOPLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SQ. FT.	◆
627	PREFORMED PLASTIC PAVEMENT MARKING (TYPE I)	SQ. FT.	◆

◆ ALL MARKINGS AT THIS LOCATION ARE "EXISTING" AS INSTALLED DURING CDOT 2012 PROJECT

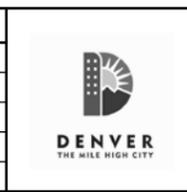
NOTE: PANEL IS EXACT COPY OF THE PANEL REMOVED FROM EXISTING POLE AT THIS LOCATION. PROVIDE PROPOSED PANEL DESIGN TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.

NOTES:

1. ALL CROSSWALK LINES AND STOP BARS AT THE PLATTE RIVER DRIVE INTERSECTION SHALL BE INSTALLED AS PART OF THE CDOT 2012 PROJECT AT THIS LOCATION.
2. REMOVAL OF ALL EXISTING TRAFFIC SIGNAL MOUNTED SIGN PANELS IS INCLUDED IN THE UNIT COST FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.
3. MOUNTING BRACKETS SHALL BE PROVIDED FOR THE FOLLOWING SIGNS SUCH THAT PANEL IS INSTALLED AT 90 DEGREE ANGLE TO THE DIRECTION OF APPROACHING TRAFFIC: R3-5 & R3-6.

Print Date: 7/11/2012
 Drawing File Name: 12-sign_stripe-platte.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials
 CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

Sheet Revisions		
Date:	Comments	Init.

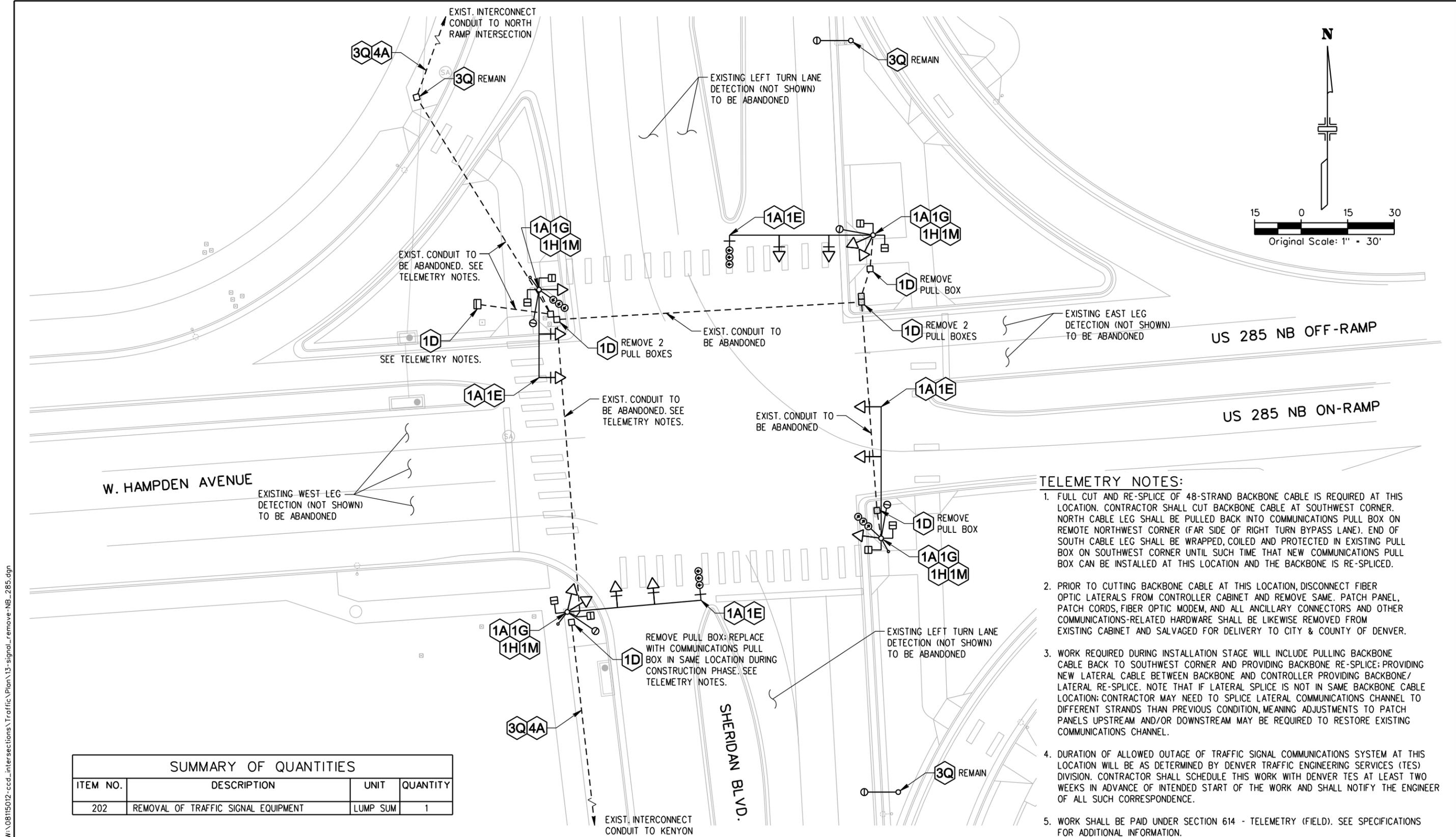


Colorado Department of Transportation
 4670 N. Holly
 Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

As Constructed
No Revisions:
Revised:
Void:

TRAFFIC SIGNAL PLAN ALAMEDA AVE. & PLATTE RIVER DRIVE SIGNING & STRIPING PLAN		
Designer:	SJS	Structure
Detailer:	JRM	Numbers
Sheet Subset:		Subset Sheets: TR12 of TR26

Project No./Code
SHE R600-391
18197
Sheet Number 55

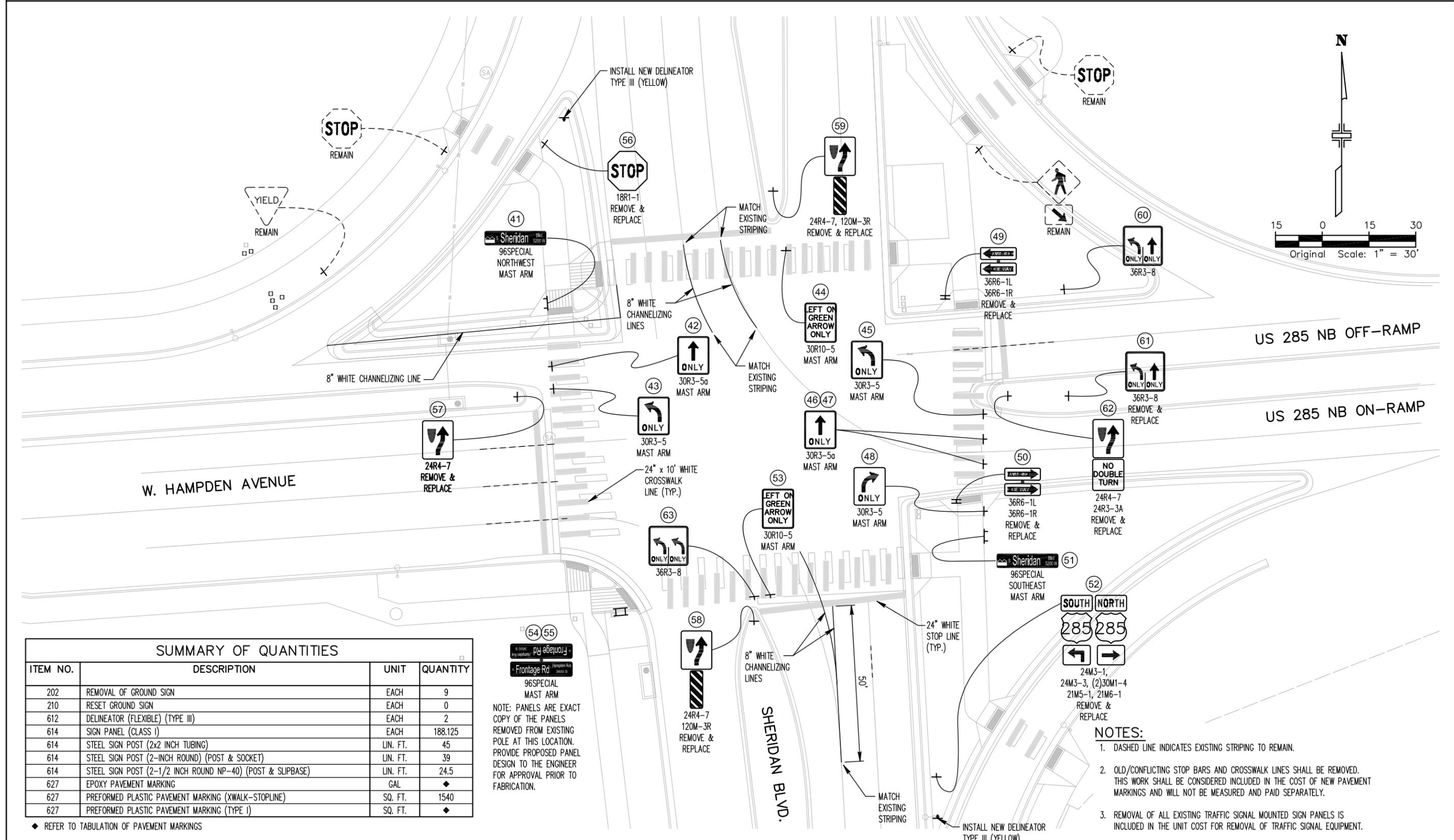


- TELEMETRY NOTES:**
1. FULL CUT AND RE-SPLICE OF 48-STRAND BACKBONE CABLE IS REQUIRED AT THIS LOCATION. CONTRACTOR SHALL CUT BACKBONE CABLE AT SOUTHWEST CORNER. NORTH CABLE LEG SHALL BE PULLED BACK INTO COMMUNICATIONS PULL BOX ON REMOTE NORTHWEST CORNER (FAR SIDE OF RIGHT TURN BYPASS LANE). END OF SOUTH CABLE LEG SHALL BE WRAPPED, COILED AND PROTECTED IN EXISTING PULL BOX ON SOUTHWEST CORNER UNTIL SUCH TIME THAT NEW COMMUNICATIONS PULL BOX CAN BE INSTALLED AT THIS LOCATION AND THE BACKBONE IS RE-SPLICED.
 2. PRIOR TO CUTTING BACKBONE CABLE AT THIS LOCATION, DISCONNECT FIBER OPTIC LATERALS FROM CONTROLLER CABINET AND REMOVE SAME. PATCH PANEL, PATCH CORDS, FIBER OPTIC MODEM, AND ALL ANCILLARY CONNECTORS AND OTHER COMMUNICATIONS-RELATED HARDWARE SHALL BE LIKewise REMOVED FROM EXISTING CABINET AND SALVAGED FOR DELIVERY TO CITY & COUNTY OF DENVER.
 3. WORK REQUIRED DURING INSTALLATION STAGE WILL INCLUDE PULLING BACKBONE CABLE BACK TO SOUTHWEST CORNER AND PROVIDING BACKBONE RE-SPLICE; PROVIDING NEW LATERAL CABLE BETWEEN BACKBONE AND CONTROLLER PROVIDING BACKBONE/ LATERAL RE-SPLICE. NOTE THAT IF LATERAL SPLICE IS NOT IN SAME BACKBONE CABLE LOCATION; CONTRACTOR MAY NEED TO SPLICE LATERAL COMMUNICATIONS CHANNEL TO DIFFERENT STRANDS THAN PREVIOUS CONDITION, MEANING ADJUSTMENTS TO PATCH PANELS UPSTREAM AND/OR DOWNSTREAM MAY BE REQUIRED TO RESTORE EXISTING COMMUNICATIONS CHANNEL.
 4. DURATION OF ALLOWED OUTAGE OF TRAFFIC SIGNAL COMMUNICATIONS SYSTEM AT THIS LOCATION WILL BE AS DETERMINED BY DENVER TRAFFIC ENGINEERING SERVICES (TES) DIVISION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH DENVER TES AT LEAST TWO WEEKS IN ADVANCE OF INTENDED START OF THE WORK AND SHALL NOTIFY THE ENGINEER OF ALL SUCH CORRESPONDENCE.
 5. WORK SHALL BE PAID UNDER SECTION 614 - TELEMETRY (FIELD). SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	LUMP SUM	1

Print Date: 4/24/2012 Drawing File Name: 13-signal_remove-NB_285.dgn Horiz. Scale: 1:30 Unit Information	Vert. Scale: As Noted Unit Leader Initials	Sheet Revisions Date: Comments Init.			DENVER THE MILE HIGH CITY	Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed No Revisions:		TRAFFIC SIGNAL PLAN NB US 285 & SHERIDAN BLVD. REMOVAL PLAN		Project No./Code SHE R600-391	
		Centennial Engineering, Inc. 5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250					Revised: Void:				Designer: SJS Detailer: JRM Sheet Subset:	

jrm 4:16:49 PM W:\0815012-ccd-intersections\Traffic\Plan\13-signal_remove-NB_285.dgn



SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF GROUND SIGN	EACH	9
210	RESET GROUND SIGN	EACH	0
612	DELINEATOR (FLEXIBLE) (TYPE III)	EACH	2
614	SIGN PANEL (CLASS I)	EACH	188,125
614	STEEL SIGN POST (2x2 INCH TUBING)	LIN. FT.	45
614	STEEL SIGN POST (2-INCH ROUND) (POST & SOCKET)	LIN. FT.	39
614	STEEL SIGN POST (2-1/2 INCH ROUND NP-40) (POST & SLIPBASE)	LIN. FT.	24.5
627	EPOXY PAVEMENT MARKING	GAL	◆
627	PREFORMED PLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SQ. FT.	1540
627	PREFORMED PLASTIC PAVEMENT MARKING (TYPE I)	SQ. FT.	◆

◆ REFER TO TABULATION OF PAVEMENT MARKINGS



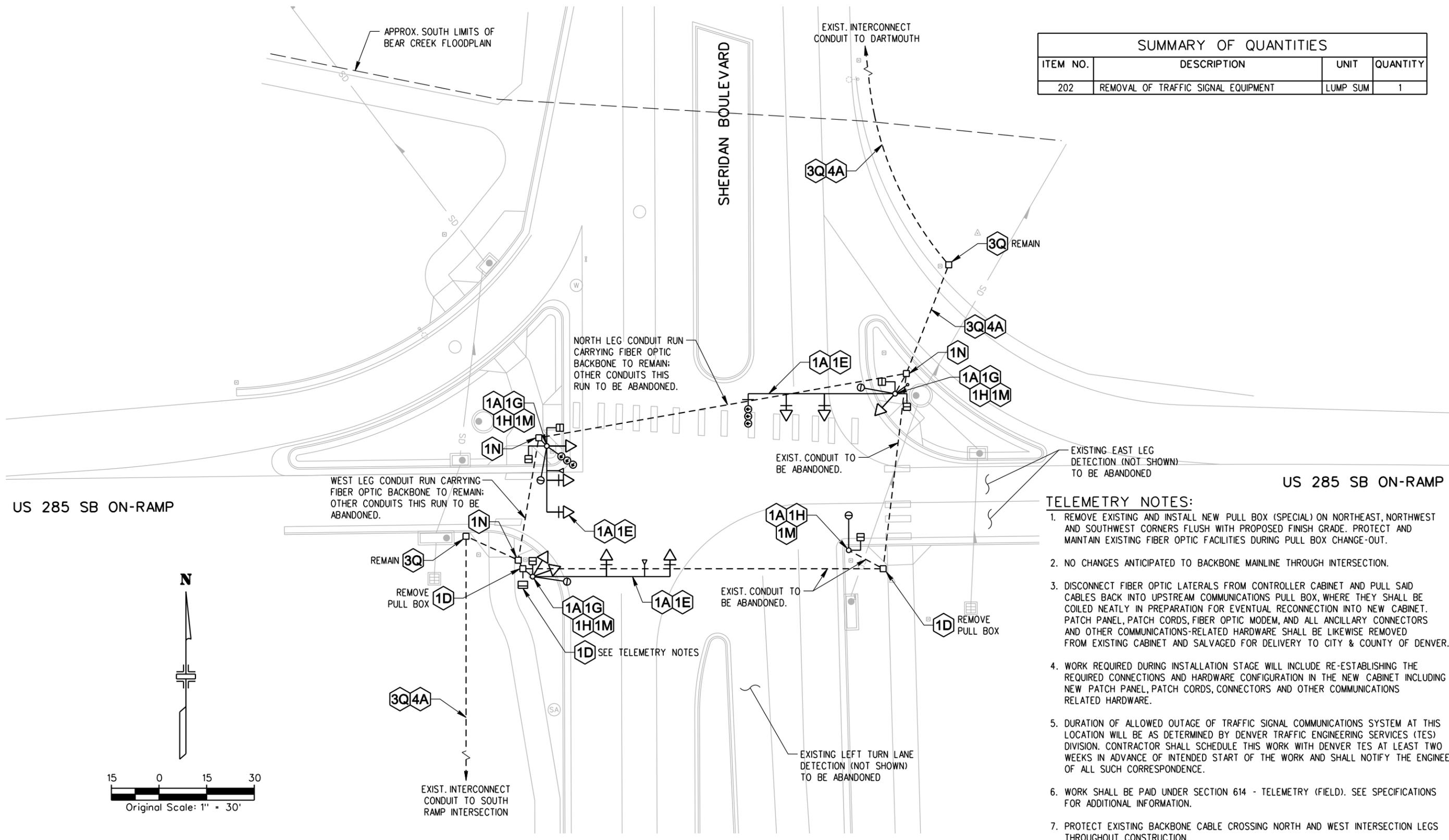
NOTE: PANELS ARE EXACT COPY OF THE PANELS REMOVED FROM EXISTING POLE AT THIS LOCATION. PROVIDE PROPOSED PANEL DESIGN TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.

NOTES:

- DASHED LINE INDICATES EXISTING STRIPING TO REMAIN.
- OLD/CONFLICTING STOP BARS AND CROSSWALK LINES SHALL BE REMOVED. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE COST OF NEW PAVEMENT MARKINGS AND WILL NOT BE MEASURED AND PAID SEPARATELY.
- REMOVAL OF ALL EXISTING TRAFFIC SIGNAL MOUNTED SIGN PANELS IS INCLUDED IN THE UNIT COST FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.

Print Date: 7/11/2012 Drawing File Name: 15-sign_stripe-NB_285.dgn Horiz. Scale: 1:30 Vert. Scale: As Noted Unit Information Unit Leader Initials	Sheet Revisions Date: Comments Init.			 Denver THE MILE HIGH CITY	Colorado Department of Transportation 4670 N. Holly 80216 Denver, CO Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed No Revisions:	TRAFFIC SIGNAL PLAN NB US 285 & SHERIDAN BLVD. SIGNING & STRIPING PLAN		Project No./Code SHE R600-391
	 CENTENNIAL ENGINEERING, INC. 5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250					Revised: Void:	Designer: SJS Detailer: JRM Sheet Subset:	Structure: Numbers: Subset Sheets: TR15 of TR26	18197 Sheet Number 58

SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	LUMP SUM	1



- TELEMETRY NOTES:**
1. REMOVE EXISTING AND INSTALL NEW PULL BOX (SPECIAL) ON NORTHEAST, NORTHWEST AND SOUTHWEST CORNERS FLUSH WITH PROPOSED FINISH GRADE. PROTECT AND MAINTAIN EXISTING FIBER OPTIC FACILITIES DURING PULL BOX CHANGE-OUT.
 2. NO CHANGES ANTICIPATED TO BACKBONE MAINLINE THROUGH INTERSECTION.
 3. DISCONNECT FIBER OPTIC LATERALS FROM CONTROLLER CABINET AND PULL SAID CABLES BACK INTO UPSTREAM COMMUNICATIONS PULL BOX, WHERE THEY SHALL BE COILED NEATLY IN PREPARATION FOR EVENTUAL RECONNECTION INTO NEW CABINET. PATCH PANEL, PATCH CORDS, FIBER OPTIC MODEM, AND ALL ANCILLARY CONNECTORS AND OTHER COMMUNICATIONS-RELATED HARDWARE SHALL BE LIKEWISE REMOVED FROM EXISTING CABINET AND SALVAGED FOR DELIVERY TO CITY & COUNTY OF DENVER.
 4. WORK REQUIRED DURING INSTALLATION STAGE WILL INCLUDE RE-ESTABLISHING THE REQUIRED CONNECTIONS AND HARDWARE CONFIGURATION IN THE NEW CABINET INCLUDING NEW PATCH PANEL, PATCH CORDS, CONNECTORS AND OTHER COMMUNICATIONS RELATED HARDWARE.
 5. DURATION OF ALLOWED OUTAGE OF TRAFFIC SIGNAL COMMUNICATIONS SYSTEM AT THIS LOCATION WILL BE AS DETERMINED BY DENVER TRAFFIC ENGINEERING SERVICES (TES) DIVISION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH DENVER TES AT LEAST TWO WEEKS IN ADVANCE OF INTENDED START OF THE WORK AND SHALL NOTIFY THE ENGINEER OF ALL SUCH CORRESPONDENCE.
 6. WORK SHALL BE PAID UNDER SECTION 614 - TELEMETRY (FIELD). SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 7. PROTECT EXISTING BACKBONE CABLE CROSSING NORTH AND WEST INTERSECTION LEGS THROUGHOUT CONSTRUCTION.

Print Date: 4/24/2012
 Drawing File Name: 16-signal_remove-SB_285.dgn
 Horiz. Scale: 1:30 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 4670 N. Holly Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

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 No Revisions:
 Revised:
 Void:

TRAFFIC SIGNAL PLAN
 SB US 285 & SHERIDAN BLVD.
 REMOVAL PLAN

Designer: SJS Structure Numbers
 Detailer: JRM
 Sheet Subset: Subset Sheets: TR16 of TR26

Project No./Code
 SHE R600-391
 18197
 Sheet Number 59

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5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

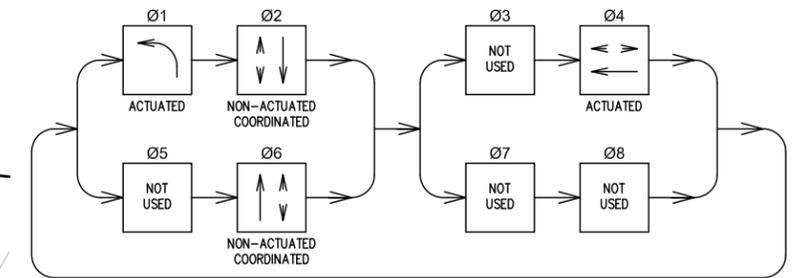
SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
503	DRILLED CAISSON (36 INCH)	LIN. FEET	49
613	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	345
613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	860
■ 613	PULL BOX (SPECIAL)	EACH	3
613	WIRING	LUMP. SUM	1
613	ELECTRIC METER PEDESTAL CABINET AND BASE	EACH	1
614	PEDESTRIAN SIGNAL FACE (16) (COUNTDOWN)	EACH	6
614	TRAFFIC SIGNAL FACE (12-12-12)	EACH	13
614	TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)	EACH	1
614	FIRE PREEMPTION UNIT AND TIMER	EACH	1
614	INTERSECTION DETECTION SYSTEM (CAMERA)	EACH	2
614	PEDESTRIAN PUSH BUTTON	EACH	2
● 614	TRAFFIC SIGNAL LIGHT POLE STEEL	EACH	1
614	TRAFFIC SIGNAL-LIGHT POLE STEEL (1 MAST ARM)	EACH	3
614	TELEMETRY (FIELD)	EACH	1
614	CLOSED CIRCUIT TELEVISION	EACH	1

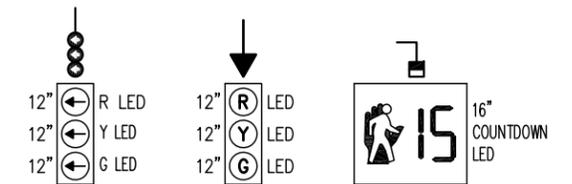
■ TYPE A AND TYPE B PULL BOXES INCLUDED IN COST OF CONDUIT AND WILL NOT BE MEASURED AND PAID SEPARATELY.

● INCLUDES PRE-CAST FOOTING

PROPOSED PHASING



SIGNAL HEAD SCHEDULE



US 285 SB ON-RAMP

US 285 SB ON-RAMP

INSTALL MANAGED ETHERNET SWITCH. TERMINATE LATERAL INTERCONNECT CABLE ON PATCH PANEL AND INSTALL JUMPERS TO CONTROLLER TRANSCIVER

INSTALLATION NOTES (SHERIDAN & US-285 SB RAMPS):

- REMOVE EXISTING COMMUNICATIONS PULL BOXES AND INSTALL NEW PULL BOX (SPECIAL) ON NORTHEAST, NORTHWEST AND SOUTHWEST CORNERS FLUSH WITH PROPOSED FINISH GRADE. PROTECT, MAINTAIN AND PRESERVE EXISTING BACKBONE CABLE CROSSING NORTH AND WEST INTERSECTION LEGS THROUGHOUT THE DURATION OF CONSTRUCTION.
- CONTRACTOR SHALL PULL EXISTING LATERAL CABLE FROM BACKBONE SPLICE BOX ON SOUTHWEST CORNER TO PROPOSED CABINET. CONNECT LATERAL CABLE AT PROPOSED CABINET USING NEW COMMUNICATIONS HARDWARE.
- MAJORITY OF IN-CABINET COMMUNICATIONS HARDWARE ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THIS INCLUDES BUT IS NOT LIMITED TO: NEW WALL-MOUNTED PATCH PANEL; NEW PATCH CORDS; NEW CONNECTORS, STRAIN RELIEF, CABLE TIES, HARNESSSES AND ALL OTHER ANCILLARY IN-CABINET EQUIPMENT. NEW ETHERNET SWITCH SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR. COST FOR ALL IN-CABINET SYSTEM COMMUNICATIONS EQUIPMENT; CABLE TERMINATION; AND CONNECTION OF ALL LATERAL CABLE, PATCH CORDS AND OTHER REQUIRED CONNECTIONS INSIDE THE CABINET IS CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
- PROVIDE 12-BULKHEAD PATCH PANEL INSIDE SHERIDAN & SB RAMPS CABINET.
- NEW CABINET, CONTROLLER AND PRE-CAST CABINET BASE SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR.

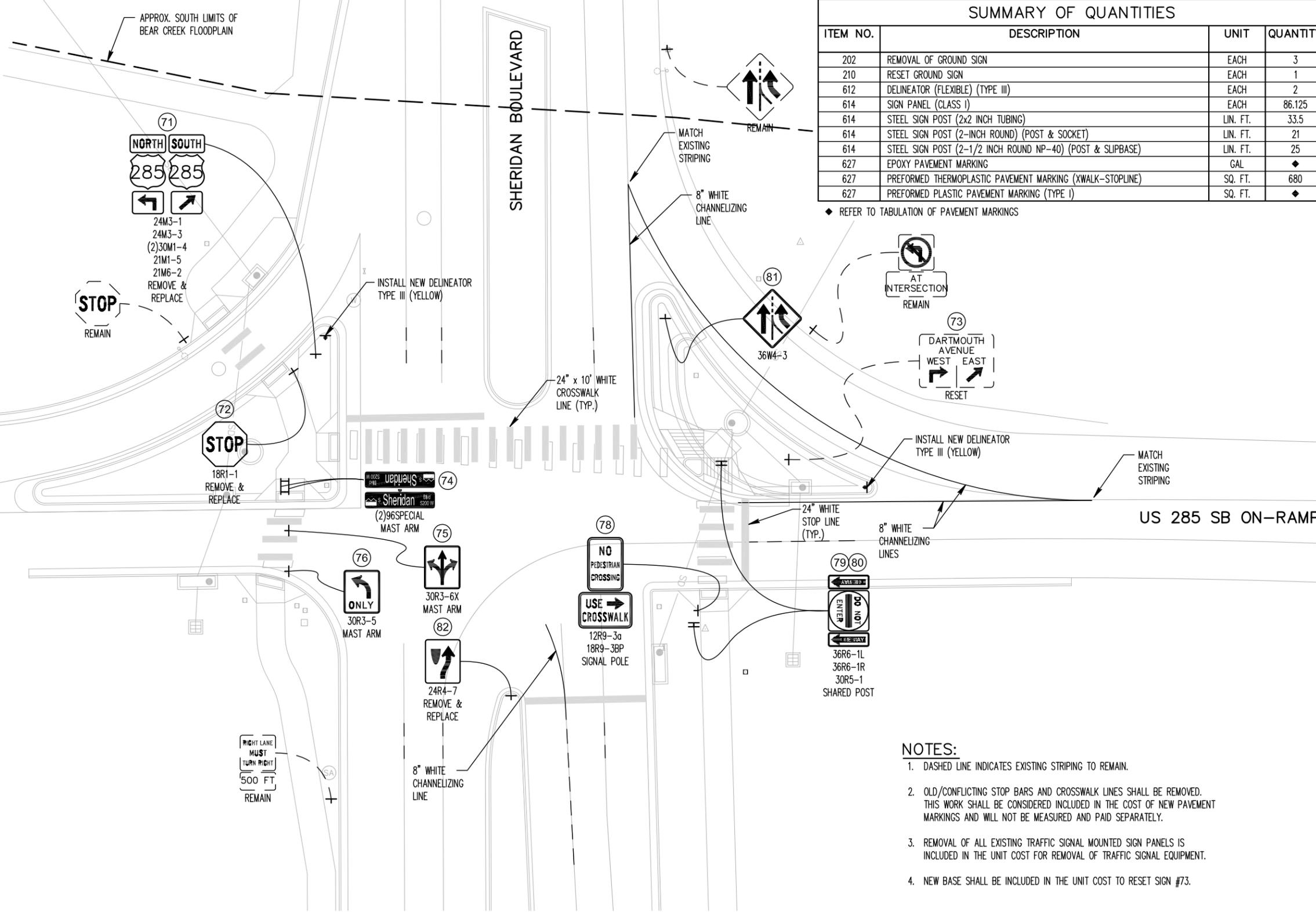
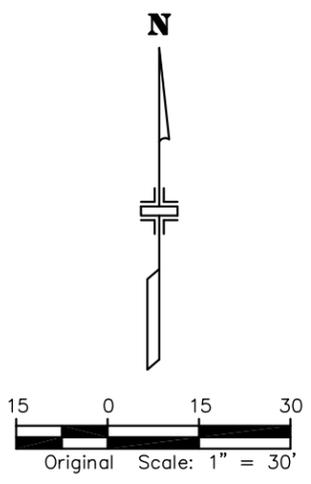
Print Date: 7/11/2012
 Drawing File Name: 17-signal_install-SB_285.dgn
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 Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

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TRAFFIC SIGNAL PLAN SB US 285 & SHERIDAN BLVD. INSTALLATION PLAN	
Designer: SJS	Structure
Detailer: JRM	Numbers
Sheet Subset:	Subset Sheets: TR17 of TR26

Project No./Code
SHE R600-391
18197
Sheet Number 60



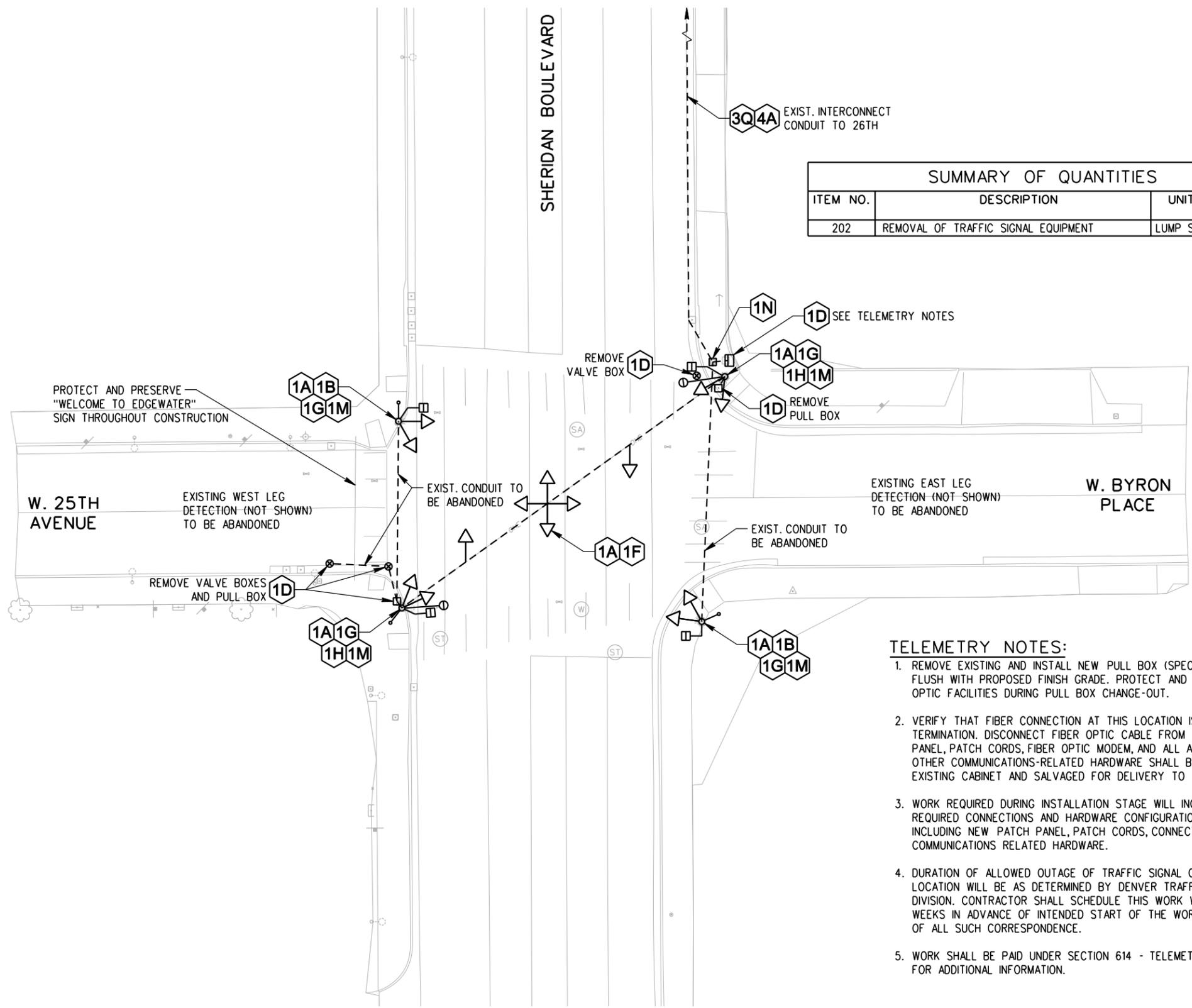
SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF GROUND SIGN	EACH	3
210	RESET GROUND SIGN	EACH	1
612	DELINEATOR (FLEXIBLE) (TYPE III)	EACH	2
614	SIGN PANEL (CLASS I)	EACH	86.125
614	STEEL SIGN POST (2x2 INCH TUBING)	LIN. FT.	33.5
614	STEEL SIGN POST (2-INCH ROUND) (POST & SOCKET)	LIN. FT.	21
614	STEEL SIGN POST (2-1/2 INCH ROUND NP-40) (POST & SLIPBASE)	LIN. FT.	25
627	EPOXY PAVEMENT MARKING	GAL	◆
627	PREFORMED THERMOPLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SQ. FT.	680
627	PREFORMED PLASTIC PAVEMENT MARKING (TYPE I)	SQ. FT.	◆

◆ REFER TO TABULATION OF PAVEMENT MARKINGS

NOTES:

1. DASHED LINE INDICATES EXISTING STRIPING TO REMAIN.
2. OLD/CONFLICTING STOP BARS AND CROSSWALK LINES SHALL BE REMOVED. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE COST OF NEW PAVEMENT MARKINGS AND WILL NOT BE MEASURED AND PAID SEPARATELY.
3. REMOVAL OF ALL EXISTING TRAFFIC SIGNAL MOUNTED SIGN PANELS IS INCLUDED IN THE UNIT COST FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.
4. NEW BASE SHALL BE INCLUDED IN THE UNIT COST TO RESET SIGN #73.

Print Date: 7/11/2012 Drawing File Name: 18-sign_stripe-SB_285.dgn Horiz. Scale: 1:30 Vert. Scale: As Noted Unit Information Unit Leader Initials 5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250	Sheet Revisions <table border="1"> <thead> <tr> <th>Date:</th> <th>Comments</th> <th>Init.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			Date:	Comments	Init.										 Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed No Revisions: Revised: Void:	TRAFFIC SIGNAL PLAN SB US 285 & SHERIDAN BLVD. SIGNING & STRIPING PLAN Designer: SJS Detailer: JRM Sheet Subset:	Project No./Code SHE R600-391 18197 Sheet Number 61
	Date:	Comments	Init.																
			Structure: Numbers: Subset Sheets: TR18 of TR26																



SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	LUMP SUM	1

TELEMETRY NOTES:

1. REMOVE EXISTING AND INSTALL NEW PULL BOX (SPECIAL) ON NORTHEAST CORNER FLUSH WITH PROPOSED FINISH GRADE. PROTECT AND MAINTAIN EXISTING FIBER OPTIC FACILITIES DURING PULL BOX CHANGE-OUT.
2. VERIFY THAT FIBER CONNECTION AT THIS LOCATION IS A BACKBONE; NOT A LATERAL TERMINATION. DISCONNECT FIBER OPTIC CABLE FROM CONTROLLER CABINET. PATCH PANEL, PATCH CORDS, FIBER OPTIC MODEM, AND ALL ANCILLARY CONNECTORS AND OTHER COMMUNICATIONS-RELATED HARDWARE SHALL BE LIKEWISE REMOVED FROM EXISTING CABINET AND SALVAGED FOR DELIVERY TO CITY & COUNTY OF DENVER.
3. WORK REQUIRED DURING INSTALLATION STAGE WILL INCLUDE RE-ESTABLISHING THE REQUIRED CONNECTIONS AND HARDWARE CONFIGURATION IN THE NEW CABINET INCLUDING NEW PATCH PANEL, PATCH CORDS, CONNECTORS AND OTHER COMMUNICATIONS RELATED HARDWARE.
4. DURATION OF ALLOWED OUTAGE OF TRAFFIC SIGNAL COMMUNICATIONS SYSTEM AT THIS LOCATION WILL BE AS DETERMINED BY DENVER TRAFFIC ENGINEERING SERVICES (TES) DIVISION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH DENVER TES AT LEAST TWO WEEKS IN ADVANCE OF INTENDED START OF THE WORK AND SHALL NOTIFY THE ENGINEER OF ALL SUCH CORRESPONDENCE.
5. WORK SHALL BE PAID UNDER SECTION 614 - TELEMETRY (FIELD). SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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Print Date: 4/24/2012	
Drawing File Name: 19-signal_remove-25th.dgn	
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Date:	Comments	Init.



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 Region 6

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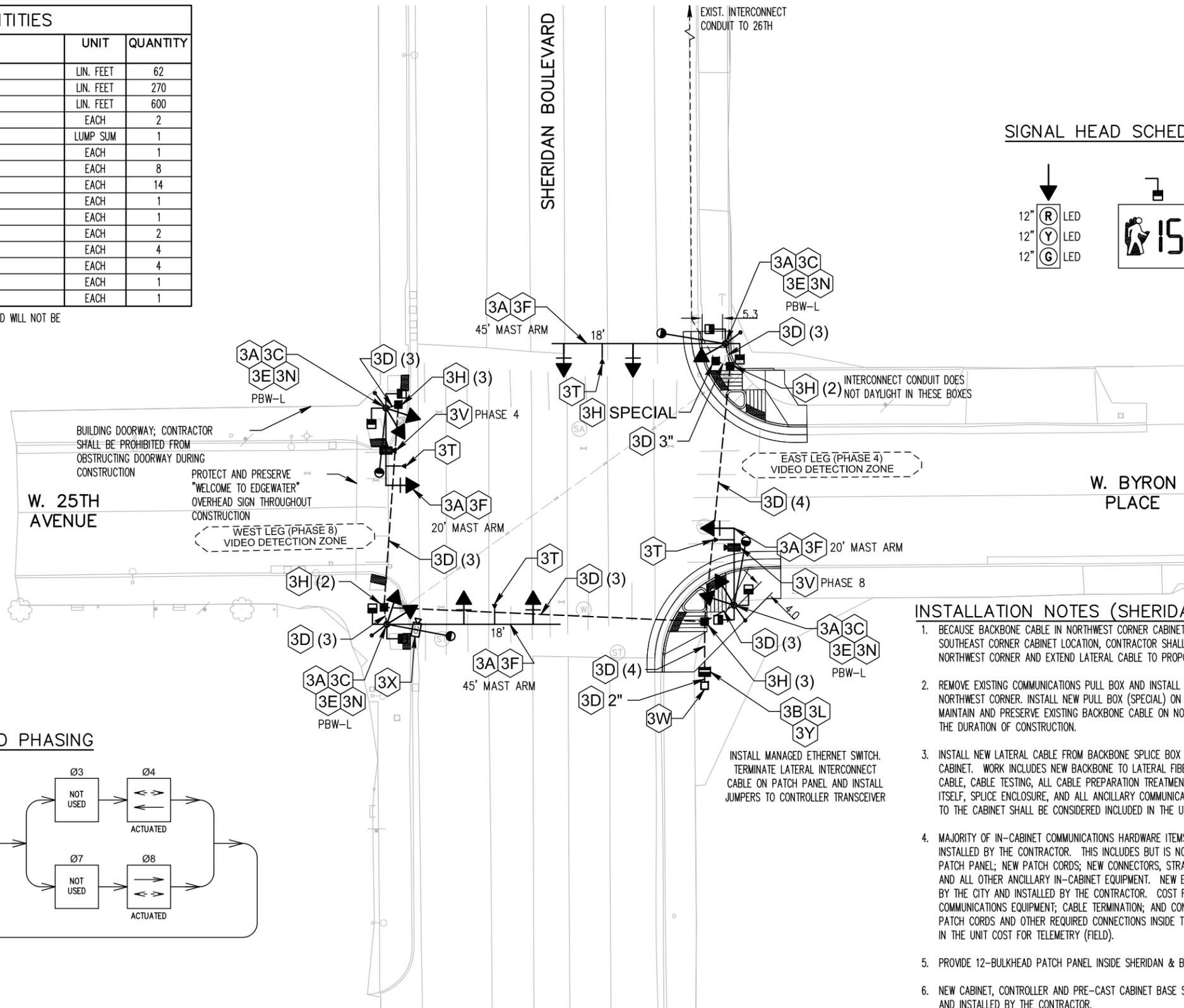
TRAFFIC SIGNAL PLAN SHERIDAN BLVD. & 25TH AVENUE REMOVAL PLAN			
Designer:	SJS	Structure Numbers	
Detailer:	JRM	Subset Sheets:	TR19 of TR26
Sheet Subset:			

Project No./Code	SHE R600-391
	18197
Sheet Number	62

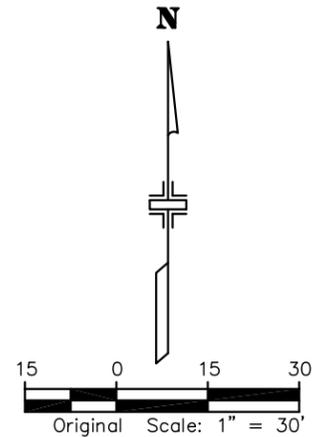
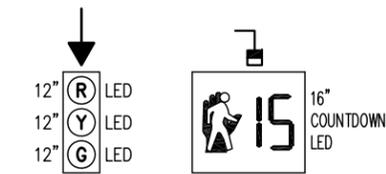
SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
503	DRILLED CAISSON (36 INCH)	LIN. FEET	62
613	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	270
613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LIN. FEET	600
■ 613	PULL BOX (SPECIAL)	EACH	2
613	WIRING	LUMP SUM	1
613	ELECTRIC METER PEDESTAL CABINET AND BASE	EACH	1
614	PEDESTRIAN SIGNAL FACE (16) (COUNTDOWN)	EACH	8
614	TRAFFIC SIGNAL FACE (12-12-12)	EACH	14
614	TRAFFIC SIGNAL CONTROLLER AND CABINET (INSTALL ONLY)	EACH	1
614	FIRE PREEMPTION UNIT AND TIMER	EACH	1
614	INTERSECTION DETECTION SYSTEM (CAMERA)	EACH	2
614	PEDESTRIAN PUSH BUTTON	EACH	4
614	TRAFFIC SIGNAL-LIGHT POLE STEEL (1 MAST ARM)	EACH	4
614	TELEMETRY (FIELD)	EACH	1
614	CLOSED CIRCUIT TELEVISION	EACH	1

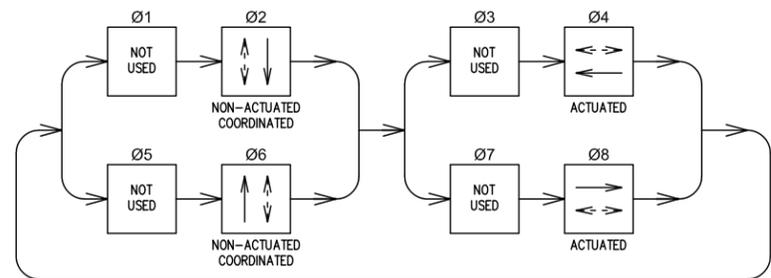
■ TYPE A AND TYPE B PULL BOXES INCLUDED IN COST OF CONDUIT AND WILL NOT BE MEASURED AND PAID SEPARATELY.



SIGNAL HEAD SCHEDULE



PROPOSED PHASING



INSTALLATION NOTES (SHERIDAN & BYRON/25TH):

1. BECAUSE BACKBONE CABLE IN NORTHWEST CORNER CABINET MAY NOT EXTEND TO PROPOSED SOUTHEAST CORNER CABINET LOCATION, CONTRACTOR SHALL PROVIDE BACKBONE SPLICE ON NORTHWEST CORNER AND EXTEND LATERAL CABLE TO PROPOSED CABINET.
2. REMOVE EXISTING COMMUNICATIONS PULL BOX AND INSTALL NEW PULL BOX (SPECIAL) ON NORTHWEST CORNER. INSTALL NEW PULL BOX (SPECIAL) ON SOUTHEAST CORNER. PROTECT, MAINTAIN AND PRESERVE EXISTING BACKBONE CABLE ON NORTHWEST CORNER THROUGHOUT THE DURATION OF CONSTRUCTION.
3. INSTALL NEW LATERAL CABLE FROM BACKBONE SPLICE BOX ON NORTHWEST CORNER TO NEW CABINET. WORK INCLUDES NEW BACKBONE TO LATERAL FIBER OPTIC CABLE SPLICE. NEW CABLE, CABLE TESTING, ALL CABLE PREPARATION TREATMENTS FOR SPLICING, THE SPLICE ITSELF, SPLICE ENCLOSURE, AND ALL ANCILLARY COMMUNICATIONS SYSTEM WORK EXTERNAL TO THE CABINET SHALL BE CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
4. MAJORITY OF IN-CABINET COMMUNICATIONS HARDWARE ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THIS INCLUDES BUT IS NOT LIMITED TO: NEW WALL-MOUNTED PATCH PANEL; NEW PATCH CORDS; NEW CONNECTORS, STRAIN RELIEF, CABLE TIES, HARNESSES AND ALL OTHER ANCILLARY IN-CABINET EQUIPMENT. NEW ETHERNET SWITCH SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR. COST FOR ALL IN-CABINET SYSTEM COMMUNICATIONS EQUIPMENT; CABLE TERMINATION; AND CONNECTION OF ALL LATERAL CABLE, PATCH CORDS AND OTHER REQUIRED CONNECTIONS INSIDE THE CABINET IS CONSIDERED INCLUDED IN THE UNIT COST FOR TELEMETRY (FIELD).
5. PROVIDE 12-BULKHEAD PATCH PANEL INSIDE SHERIDAN & BYRON CABINET.
6. NEW CABINET, CONTROLLER AND PRE-CAST CABINET BASE SHALL BE FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR.

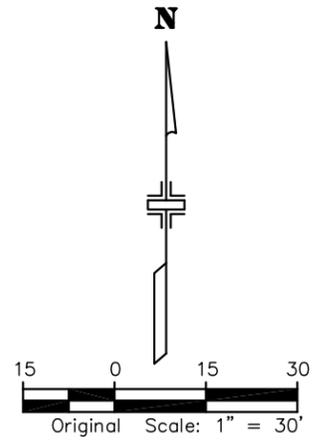
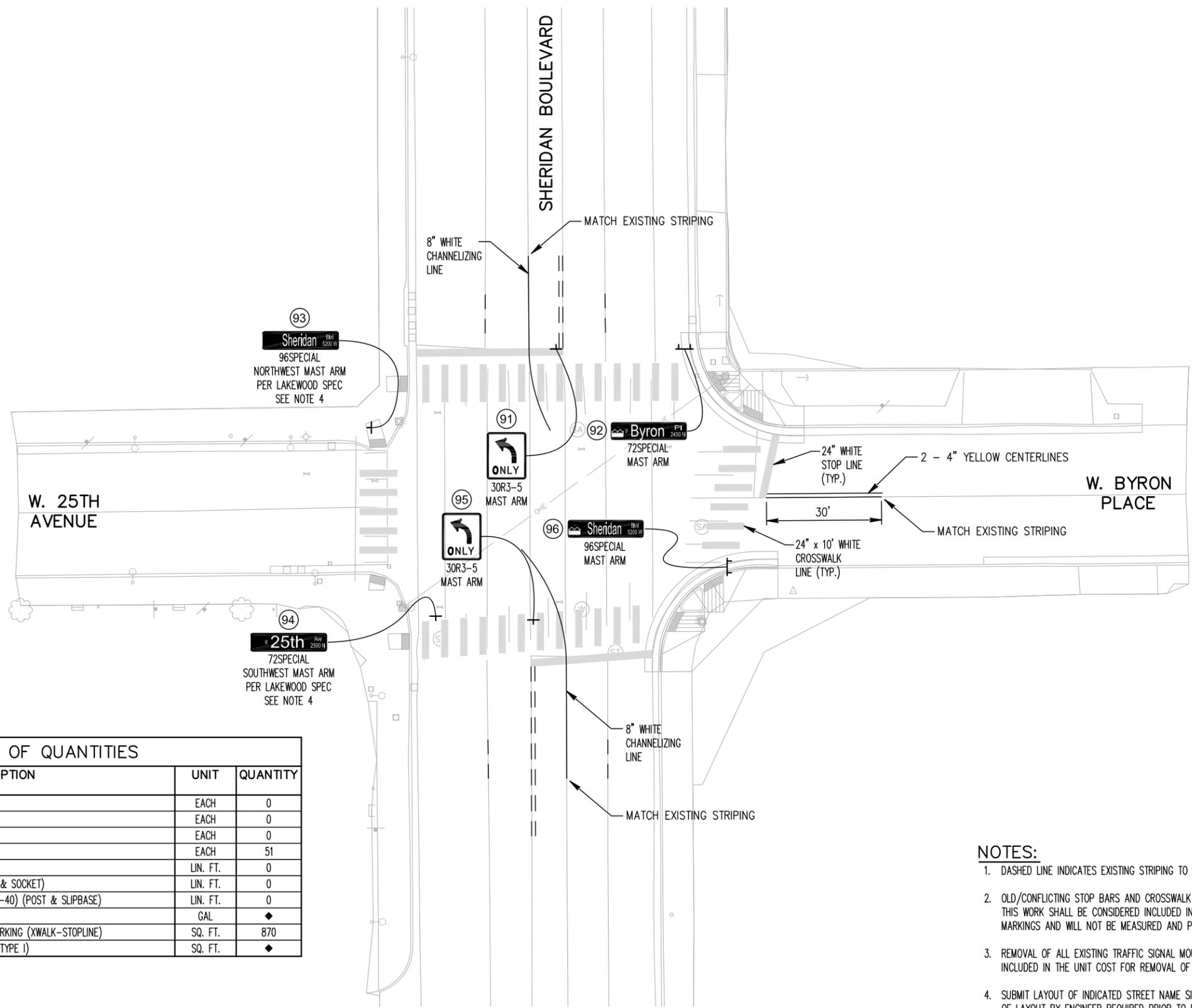
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 Unit Information Unit Leader Initials

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TRAFFIC SIGNAL PLAN SHERIDAN BLVD. & 25TH AVENUE INSTALLATION PLAN	
Designer: SJS	Structure
Detailer: JRM	Numbers
Sheet Subset:	Subset Sheets: TR20 of TR26

Project No./Code
SHE R600-391
18197
Sheet Number 63



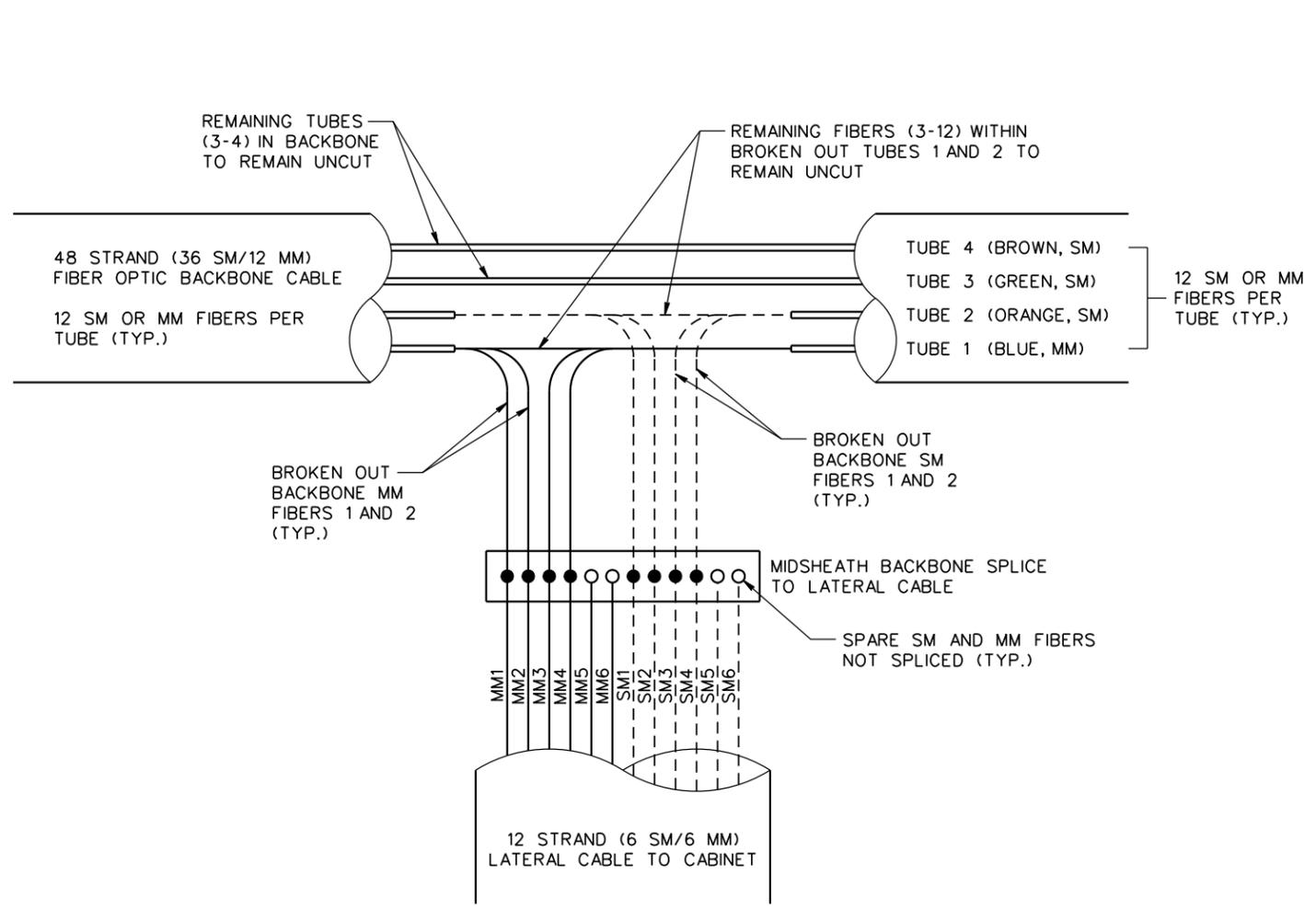
SUMMARY OF QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
202	REMOVAL OF GROUND SIGN	EACH	0
210	RESET GROUND SIGN	EACH	0
612	DELINEATOR (FLEXIBLE) (TYPE III)	EACH	0
614	SIGN PANEL (CLASS I)	EACH	51
614	STEEL SIGN POST (2x2 INCH TUBING)	LIN. FT.	0
614	STEEL SIGN POST (2-INCH ROUND) (POST & SOCKET)	LIN. FT.	0
614	STEEL SIGN POST (2-1/2 INCH ROUND NP-40) (POST & SLIPBASE)	LIN. FT.	0
627	EPOXY PAVEMENT MARKING	GAL	◆
627	PREFORMED THERMOPLASTIC PAVEMENT MARKING (XWALK-STOPLINE)	SQ. FT.	870
627	PREFORMED PLASTIC PAVEMENT MARKING (TYPE I)	SQ. FT.	◆

◆ REFER TO TABULATION OF PAVEMENT MARKINGS

- NOTES:**
- DASHED LINE INDICATES EXISTING STRIPING TO REMAIN.
 - OLD/CONFLICTING STOP BARS AND CROSSWALK LINES SHALL BE REMOVED. THIS WORK SHALL BE CONSIDERED INCLUDED IN THE COST OF NEW PAVEMENT MARKINGS AND WILL NOT BE MEASURED AND PAID SEPARATELY.
 - REMOVAL OF ALL EXISTING TRAFFIC SIGNAL MOUNTED SIGN PANELS IS INCLUDED IN THE UNIT COST FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.
 - SUBMIT LAYOUT OF INDICATED STREET NAME SIGNS TO THE ENGINEER. APPROVAL OF LAYOUT BY ENGINEER REQUIRED PRIOR TO FABRICATION OF PANEL.

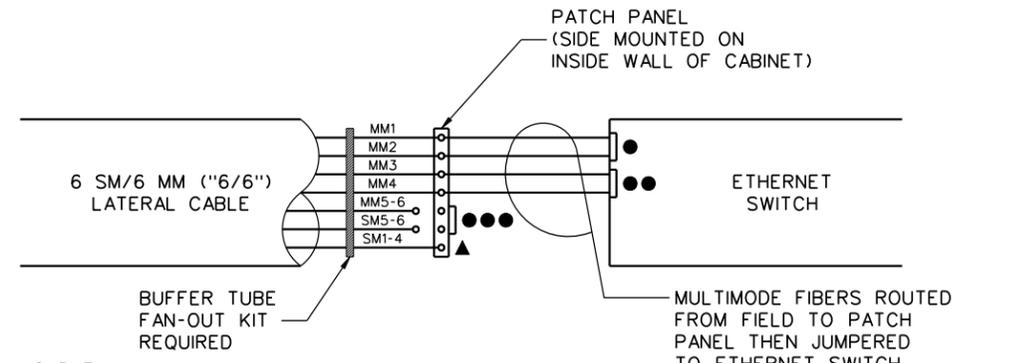
Print Date: 7/11/2012 Drawing File Name: 21-sign_stripe-25th.dgn Horiz. Scale: 1:30 Vert. Scale: As Noted Unit Information Unit Leader Initials	<table border="1"> <thead> <tr> <th colspan="3">Sheet Revisions</th> </tr> <tr> <th>Date:</th> <th>Comments</th> <th>Init.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Sheet Revisions			Date:	Comments	Init.											Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed No Revisions:	TRAFFIC SIGNAL PLAN SHERIDAN BLVD. & 25TH AVENUE SIGNING & STRIPING PLAN		Project No./Code SHE R600-391
		Sheet Revisions																				
Date:	Comments	Init.																				
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CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250



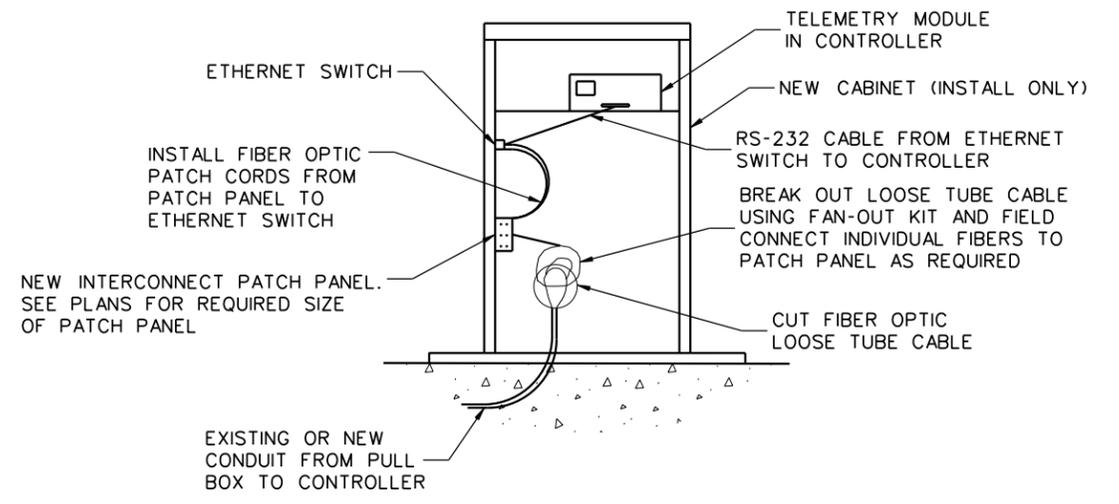
DETAIL A
 BACKBONE CABLE BREAKOUT
 (NOT TO SCALE)
 ● INDICATES FIBERS SPLICED OR LANDED
 ○ INDICATES FIBERS NOT SPLICED OR LANDED

DETAIL A IS INTENDED TO BE SCHEMATIC ONLY. ALTERNATE SPLICE CONFIGURATIONS WILL BE REQUIRED AT LOCATIONS WHERE, FOR EXAMPLE, BACKBONE SPLICE LOCATIONS WILL BE CHANGED, MEANING USE OF BLUE TUBE FIBERS 3/4 OR 5/6 MAY BE REQUIRED. CONTRACTOR SHALL PROVIDE PROPOSED SPLICE AND TERMINATION DETAIL FOR ALL SIX LOCATIONS TO DENVER T.E.S. FOR APPROVAL PRIOR TO DISCONNECTION OF EXISTING INTERCONNECT. PROPOSED DETAILS SHALL BE BASED ON CONTRACTOR'S FIELD VERIFICATION OF EXISTING FIBER CONFIGURATION AT EACH INTERSECTION. ALL COSTS, LABOR AND MATERIALS FOR DEVELOPMENT OF REFERENCED DETAILS, CABLE BREAK-OUT, FAN-OUT AND SPLICING SHALL BE INCLUDED UNDER SECTION 614 - FIBER OPTIC CABLE.



- LATERAL CABLE
 - MULTIMODE FIBERS 1 AND 2 USED FOR UPSTREAM SYSTEM COMMUNICATIONS.
 - LATERAL CABLE
 - MULTIMODE FIBERS 3 AND 4 USED FOR DOWNSTREAM SYSTEM COMMUNICATIONS.
 - LATERAL CABLE
 - MULTIMODE FIBERS 5 AND 6 AND SINGLE MODE FIBERS 5 AND 6 ARE SPARES NOT LANDED ON PATCH PANEL.
 - LATERAL CABLE
 - ▲ SINGLE MODE FIBERS 1 - 4 USED FOR CCTV CONTROL AND DATA; LANDED ON PATCH PANEL WITH JUMPER CONNECTIONS (NOT SHOWN) TO CCTV CONTROLLER.
- 2 SINGLE MODE AND 2 MULTIMODE FIBERS RUN THROUGH FAN-OUT KIT AND NOT LANDED.

DETAIL B
 ALL LABOR AND MATERIALS FOR CONTRACTOR'S WORK INSIDE INDIVIDUAL FIELD CABINETS SHALL BE CONSIDERED INCLUDED UNDER SECTION 614 - TELEMETRY (FIELD).



DETAIL C
 TYPICAL CABINET TERMINATION
 (NOT TO SCALE)

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 4670 N. Holly Denver, CO 80216
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TRAFFIC SIGNAL PLAN CITY & COUNTY OF DENVER COMMUNICATIONS DETAILS			
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Detailer:	JRM		
Sheet Subset:		Subset Sheets: TR22 of TR26	

Project No./Code
SHE R600-391
18197
Sheet Number 65

TABULATION OF SIGNS

SIGN NO.	ACTION	SIGN CODE	LOCATION	POLE/ CORNER	SIGN LEGEND	PANEL SIZE	COLOR	REMOVE GROUND SIGN (EA)	REMOVE SIGN PANEL (EA)	RESET GROUND SIGN (EA)	NUMBER OF POSTS	STEEL SIGN SUPPORT 2" ROUND	STEEL SIGN SUPPORT 2.5" ROUND P1	STEEL SIGN POST 2" x 2" TUBING (LF)	SIGN PANEL CLASS 1 (SF)	
1	New Panel	84 Special	Clay	NW	W Alameda Ave	84" x 22"	Green					No Post; Mast Arm Mount			12.83	
2	New Panel	72 Special	Clay	NW	S Clay St	72" x 22"	Green					No Post; Mast Arm Mount			11	
3	New Panel	30R3-5	Clay	NW	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
4	New Panel	30R3-5	Clay	SE	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
5	New Panel	72 Special	Clay	SE	S Clay St	72" x 22"	Green					No Post; Mast Arm Mount			11	
6	New Panel	84 Special	Clay	SE	W Alameda Ave	84" x 22"	Green					No Post; Mast Arm Mount			12.83	
7-10	Not Used	Alameda & Clay Subtotals							0	0	0	0	0	0	0	51
11	New Panel	72 Special	Lipan	NW	S Lipan St	72" x 22"	Green					No Post; Mast Arm Mount			11	
12	New Panel	84 Special	Lipan	NE	W Alameda Ave	84" x 22"	Green					No Post; Signal Pole Mount			12.83	
13	New Panel	84 Special	Lipan	SW	W Alameda Ave	84" x 22"	Green					No Post; Mast Arm Mount			12.83	
14	New Panel	72 Special	Lipan	SE	S Lipan St	72" x 22"	Green					No Post; Mast Arm Mount			11	
15	New Panel	30R3-5	Lipan	SE	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
16	New Panel	30R3-5	Lipan	NW	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
17-20	Not Used	Alameda & Lipan Subtotals							0	0	0	0	0	0	0	51
21	New Ground Sign		Platte Riv Dr	NW	Bike Route	24" x 18"	Green				1			11.75	3	
	w / #21	21M6-1			Arrow	21" x 15"	Green					With # 21			2.175	
22	New Ground Sign		Platte Riv Dr	NW	Bike Route	24" x 18"	Green				1			11.75	3	
	w / #22				Arrow	21" x 15"	Green					With # 22			2.175	
23	New Panel	108 Special	Platte Riv Dr	NW	S Platte River Dr	108" x 22"	Green					No Post; Signal Pole Mount			16.5	
24	New Panel	84 Special	Platte Riv Dr	NE	W Alameda Ave	84" x 22"	Green					No Post; Signal Pole Mount			12.83	
25	New Ground Sign	24M3-4	Platte Riv Dr	NW	West	24" x 12"	White				1			12	2	
	w / #25	24M1-5A			SH-26	24" x 24"	White					With # 25			4	
26	New Panel	24R14-1	Platte Riv Dr	NW	Truck Route	24" x 18"	White					No Post; Signal Pole Mount			3	
	w / #26	21M6-1	Platte Riv Dr		Arrow	21" x 15"	White					With # 26			2.175	
27	New Panel	30R3-5	Platte Riv Dr	SE	Lt Only	30" x 36"	White					No Post; Span Wire Mount			7.5	
28	Not Used															
29	Not Used															
30	New Panel	Special	Platte Riv Dr	SW	To Jason Street	60" x 30"	Green					No Post; Signal Pole Mount			12.5	
31	Not Used															
32	New Panel	108 Special	Platte Riv Dr	SE	S Platte River Dr	108" x 22"	Green					No Post; Signal Pole Mount			16.5	
33-40	Not Used	Alameda & Platte River Drive Subtotal							0	0	0	3	0	0	35.5	74.525
41	New Panel	96 Special	285 S Ramps	NW	S Sheridan Blvd	96" x 22"	Green					No Post; Mast Arm Mount			14.67	
42	New Panel	30R3-5A	285 S Ramps	NW	Thru Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
43	New Panel	30R3-5	285 S Ramps	NW	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
44	New Panel	30R10-5	285 S Ramps	NE	Lt/Arrow Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
45	New Panel	30R3-5	285 S Ramps	SE	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
46	New Panel	30R3-5A	285 S Ramps	SE	Thru Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
47	New Panel	30R3-5A	285 S Ramps	SE	Thru Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
48	New Panel	30R3-5B	285 S Ramps	SE	Rt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5	
49	Remove/Replace	36R6-1L	285 S Ramps	NE	One Way Left	36" x 12"	Black	1			1	9			3	
	w / #49	36R6-1R			One Way Right	36" x 12"	Black					With #49			3	
50	Remove/Replace	36R6-1L	285 S Ramps	SE	One Way Left	36" x 12"	Black	1			1	9			3	
	w / #50	36R6-1R			One Way Right	36" x 12"	Black					With #50			3	
51	New Panel	96 Special	285 S Ramps	SE	S Sheridan Blvd	96" x 22"	Green					No Post; Mast Arm Mount			14.67	
52	Remove/Replace	24M3-1	285 S Ramps	SE	North	24" x 12"	White	1			1		12.5		2	
	w / #52	24M3-3			South	24" x 12"	White					With #52			2	
	w / #52	30M1-4			US-285 Shield	30" x 24"	White					With #52			5	
	w / #52	30M1-4			US-285 Shield	30" x 24"	White					With #52			5	
	w / #52	21M5-1			Arrow	21" x 15"	White					With #52			2.1875	
	w / #52	21M6-1			Arrow	21" x 15"	White					With #52			2.1875	

Print Date: 7/11/2012

Drawing File Name: 23-tab-signs-1.dgn

Horiz. Scale: 1:1

Vert. Scale: As Noted

Unit Information

Unit Leader Initials



Sheet Revisions

Date:	Comments	Init.



Colorado Department of Transportation
 4670 N. Holly, Denver, CO 80216
 Phone: 303-398-6738 FAX: 303-398-6781
 Region 6

As Constructed

No Revisions:
 Revised:
 Void:

TRAFFIC SIGNAL PLAN
 TABULATION OF SIGNS (1)

Designer: SJS
 Detailer: JRM
 Sheet Subset:
 Structure Numbers
 Subset Sheets: TR23 of TR26

Project No./Code

SHE R600-391
 18197
 Sheet Number 66



5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

TABULATION OF SIGNS

SIGN NO.	ACTION	SIGN CODE	LOCATION	POLE/ CORNER	SIGN LEGEND	PANEL SIZE	COLOR	REMOVE GROUND SIGN (EA)	REMOVE SIGN PANEL (EA)	RESET GROUND SIGN (EA)	NUMBER OF POSTS	STEEL SIGN SUPPORT 2" ROUND	STEEL SIGN SUPPORT 2.5" ROUND P1	STEEL SIGN POST 2" x 2" TUBING (LF)	SIGN PANEL CLASS 1 (SF)
53	New Panel	30R10-5	285 S Ramps	SW	Lt/Arrow Only	30" x 36"	White					No Post; Mast Arm Mount			7.5
54	New Panel	96 Special	285 S Ramps	SW	S Frontage Rd	96" x 22"	Green					No Post; Mast Arm Mount			14.67
55	New Panel	96 Special	285 S Ramps	SW	S Frontage Rd	96" x 22"	Green					No Post; Mast Arm Mount			14.67
56	Remove/Replace	18R1-1	285 S Ramps	NW	Stop (Bike)	18" x 18"	Red	1			1			10.5	2.25
57	Remove/Replace	24R4-7	285 S Ramps	W Median	Keep Right	24" x 30"	White	1			1			11.5	5
58	Remove/Replace	24R4-7	285 S Ramps	S Median	Keep Right	24" x 30"	White	1			1			11.5	5
	w / #58	120M-3R			Object Mkr	12" x 36"	Yellow					With #58			3
59	Remove/Replace	24R4-7	285 S Ramps	N Median	Keep Right	24" x 30"	White	1			1			11.5	5
	w / #59	120M-3R			Object Mkr	12" x 36"	Yellow					With #59			3
60	New Ground Sign	36R3-8c	285 S Ramps	NE Island	Lt/Thru Only	36" x 30"	White				1	10.5			7.5
61	Remove/Replace	36R3-8c	285 S Ramps	E Median	Lt/Thru Only	36" x 30"	White	1			1	10.5			7.5
62	Remove/Replace	24R4-7	285 S Ramps	E Median	Keep Right	24" x 30"	White	1			1		12		5
	w / #62	24R3-3A			No Double Turn	24" x 30"	White					With #62			5
63	New Panel	36R3-8b	285 S Ramps	SW	Lt/Lt Only	36" x 30"	White					No Post; Mast Arm Mount			7.5
64-70	Not Used	Sheridan/S Ramps Subtotals						9	0	0	10	39	24.5	45	188.125
71	Remove/Replace	24M3-1	285 N Ramps	NW	North	24" x 12"	White	1			1		12.5		2
	w / #71	24M3-3			South	24" x 12"	White					With #71			2
	w / #71	30M1-4			US-285 Shield	30" x 24"	White					With #71			5
	w / #71	30M1-4			US-285 Shield	30" x 24"	White					With #71			5
	w / #71	21M1-5			Arrow	21" x 15"	White					With #71			2.1875
	w / #71	21M6-2			Arrow	21" x 15"	White					With #71			2.1875
72	Remove/Replace	18R1-1	285 N Ramps	NW	Stop (Bike)	18" x 18"	Red	1			1			10.5	2.25
73	Reset Sign		285 N Ramps	NE	Dartmouth Guide					1					
74	New Panel	(2)96 Special	285 N Ramps	NW	S Sheridan Blvd	96" x 22"	Green					No Post; Mast Arm Mount			29.33
75	New Panel	30R3-6X	285 N Ramps	NW	Lane Use	30" x 36"	White					No Post; Mast Arm Mount			7.5
76	New Panel	30R3-5	285 N Ramps	NW	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5
77	Not Used														
78	New Ground Sign	12R9-3A	285 N Ramps	SE	No Ped Xing	12" x 18"	White				1			11.5	1.5
	w / #78	18R9-3BP			Use Xwalk	18" x 12"	White					With # 68			1.5
79	New Ground Sign	30R5-1	285 N Ramps	SE	Do Not Enter	30" x 30"	Red				1	10.5			6.25
	w / #79	36R6-1L			One Way	36" x 12"	White					With # 69			3
	w / #79	36R6-1R			One Way	36" x 12"	White					With # 69			3
80	New Ground Sign	30R5-1	285 N Ramps	NE	Do Not Enter	30" x 30"	Red				1	10.5			6.25
	w / #80	36R6-1L			One Way	36" x 12"	White					With # 70			3
	w / #80	36R6-1R			One Way	36" x 12"	White					With # 70			3
81	New Ground Sign	36W4-3	285 N Ramps	NW Island	Merge	36" x 36"	Yellow				1		12.5		9
82	Remove/Replace	24R4-7	285 N Ramps	S Median	Keep Right	24" x 30"	White	1			1			11.5	5
83-90	Not Used	Sheridan/N Ramps Subtotals						3	0	1	7	21	25	33.5	86.125
91	New Panel	30R3-5	25th/Byron	NE	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5
92	New Panel	72 Special	25th/Byron	NE	W Byron Pl	72" x 22"	Green					No Post; Mast Arm Mount			11
93	New Panel	96 Special	25th/Byron	NE	Sheridan Blvd	96" x 22"	Blue					No Post; Mast Arm Mount			14.67
94	New Panel	72 Special	25th/Byron	NE	W 25th Ave	72" x 22"	Blue					No Post; Mast Arm Mount			11
95	New Panel	30R3-5	25th/Byron	SW	Lt Only	30" x 36"	White					No Post; Mast Arm Mount			7.5
96	New Panel	96 Special	25th/Byron	SE	Sheridan Blvd	96" x 22"	Green					No Post; Mast Arm Mount			14.67
97-100	Not Used	Sheridan/Byron Place Subtotals						0	0	0	0	0	0	0	51
PROJECT TOTALS								12	0	1	20	60	49.5	114	590.285

NOTES:

- Existing sign panels attached to old signal equipment shall be removed as part of the lump sum cost for Removal of Traffic Signal Equipment.
- Unit cost for ground signs to be reset shall include new foundation in accordance with CDOT or City standards for the post in question, regardless whether slip-base, socket or other type is required.
- Unit cost per linear foot for new steel sign posts (2" x 2" Tubing) shall include all labor and materials required for installation in accordance with Denver standards.
- Unit cost per linear foot for new 2" Round Steel Sign Post installation shall include all labor and materials required for foundation and socket installation in accordance with S-614-8.

Print Date: 7/11/2012	Sheet Revisions			 DENVER <small>THE MILE HIGH CITY</small>	Colorado Department of Transportation  4670 N. Holly, 80216 Denver, CO Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed		TRAFFIC SIGNAL PLAN TABULATION OF SIGNS (2)		Project No./Code	
Drawing File Name: 24-tab-signs-2.dgn	Date:	Comments:	Init.			No Revisions:	SHE R600-391				
Horiz. Scale: 1:1	Vert. Scale: As Noted					Revised:	Designer: SJS	Structure:	18197		
Unit Information	Unit Leader Initials					Void:	Detailer: JRM	Numbers:	Sheet Number 67		
 5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250						Sheet Subset:		Subset Sheets: TR24 of TR26			

TABULATION OF PAVEMENT MARKINGS AND DELINEATORS													
LOCATION	DELINEATORS (EACH)			PAVEMENT MARKING LINES (LF)				PERFORMED THERMOPLASTIC PAVEMENT MARKINGS (LF/EA)					
		TYPE III		EDGE	LANE	CENTER	CHANNELIZING	CROSS WALK	STOP	PVMT. MARKING ARROW SINGLE	PVMT. SYMBOL BIKE (w/ HELMET)	PVMT. LETTER	
		FLEXIBLE 3 YELLOW		WHITE SOLID 4 INCH	WHITE SOLID 4 INCH	YELLOW SOLID 4 INCH	WHITE SOLID 8 INCH	WHITE DASHED 8 INCH	WHITE SOLID 24 INCH	WHITE SOLID 24 INCH	EACH	EACH	EACH
Alameda & Clay						152▲	130			32	105		
Alameda & Lipan													
Alameda & Platte River Drive													
Sheridan & US-285 South Ramp Intersection		2					170		60	170			
Sheridan & US-285 North Ramp Intersection		2					380		24	100			
Sheridan & 25th/Byron Place						60	100		35	85			
Total LF Epoxy						212	780						
Total SF Epoxy						71	520						
Total Gallons Epoxy						1●	6●						
Total LF or EA Performed Markings									151	460			
Total SF Performed Markings									3020	920			
Total Delineators (Each)		4											

● ADDITIONAL QUANTITY NOT SHOWN IN PLANS TO ACCOMMODATE ADDITIONAL STRIPING THAT MAY BE DIRECTED BY THE ENGINEER.
 ■ 300 SF LANE LINE MARKINGS NOT SHOWN IN PLANS TO ACCOMMODATE LANE LINE AND/OR CAT TRACK REPLACEMENT AS MAY BE DIRECTED BY THE ENGINEER.
 ▲ INCLUDES DASHED "CAT TRACKS" ACROSS INTERSECTION.

SUMMARY OF DELINEATORS	
COLOR	TYPE III (EACH)
3 YELLOW	4
TOTAL	4

SUMMARY OF PAVEMENT MARKING QUANTITIES					
COLOR	PAVEMENT MARKING PAINT (GAL.)	EPOXY PAVEMENT MARKING (GAL.)	PERFORMED PLASTIC PAVEMENT MARKING (TYPE I) (SF)	PERFORMED THERMOPLASTIC (NON-PREHEAT SURFACE) (XWALK-STOPLINE) (SF)	SANDBLASTING (SF) ▲
YELLOW		1		0	
WHITE		6	300	3940	
TOTAL		7	300	3940	

▲ NEW CONCRETE PAVEMENT SHALL BE SANDBLASTED TO PREPARE SURFACE FOR INSTALLATION OF PERFORMED MARKINGS AS PER MANUFACTURER'S RECOMMENDATION.

- NOTES:**
- REMOVAL OF EXISTING DELINEATORS IS CONSIDERED INCLUDED IN THE UNIT COST FOR NEW DELINEATORS AND IS NOT MEASURED AND PAID SEPARATELY.
 - REMOVAL OF EXISTING PAVEMENT MARKINGS IS CONSIDERED INCLUDED IN THE UNIT COST FOR NEW PAVEMENT MARKINGS AND IS NOT MEASURED AND PAID SEPARATELY.
 - SURFACE PREPARATION FOR INSTALLATION OF NEW PAVEMENT MARKINGS IS CONSIDERED INCLUDED IN THE UNIT COST FOR NEW PAVEMENT MARKINGS AND IS NOT MEASURED AND PAID SEPARATELY.

Print Date: 7/11/2012	 5420 Ward Road, Suite 125 Arvada, CO 80002 (720) 279-7250	Sheet Revisions Date: Comments Init.			 DENVER THE MILE HIGH CITY	Colorado Department of Transportation  4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781 Region 6	As Constructed No Revisions:		TRAFFIC SIGNAL PLAN TABULATION OF PAVEMENT MARKINGS AND DELINEATORS		Project No./Code SHE R600-391	
Drawing File Name: 25-tab-pavemrks-1.dgn							Revised:	Designer: SJS			Structure:	18197
Horiz. Scale: 1:1 Vert. Scale: As Noted							Void:	Detailer: JRM	Numbers:	Sheet Number 68		
Unit Information Unit Leader Initials								Sheet Subset:	Subset Sheets: TR25 of TR26			

SUMMARY OF CONSTRUCTION TRAFFIC CONTROL DEVICES (FOR INFORMATION ONLY)

SIGNS / CONSTRUCTION PHASE			SHE R600-391								PROJECT TOTALS					
CODE	LEGEND	DIMENSIONS	PANEL SIZE				PANEL SIZE				PANEL SIZE					
			A	B	C	SPECIAL	A	B	C	SPECIAL	A	B	C	SPECIAL		
W20-1	Road Work Ahead	48" x 48"		6									0	6		
W4-2L	Left Lane Closed (Symb)	48" x 48"		2									0	2		
W4-2R	Right Lane Closed (Symb)	48" x 48"		2									0	2		
W20-7a	Flagger	48" x 48"		2									0	2		
R3-1	No Right Turn	36" x 36"	2										2	0		
R3-2	No Left Turn	36" x 36"	2										2	0		
48W8-1	Bump	48" x 48"		1									0	1		
G20-10	XYZ Construction Thanks You	48" x 24"		6									0	6		
R9-9	Sidewalk Closed	24" x 12"	4										4	0		
R9-11A	Sidewalk Closed Cross Here (Left)	24" x 12"	3										3	0		
R9-11A	Sidewalk Closed Cross Here (Right)	24" x 12"	3										3	0		
W1-8	Chevron	12" x 18"	6										6	0		
M4-9A	Bicycle Pedestrian Detour	30" x 24"	2										2	0		
30R3-7R	Right Lane Must Turn Right	30" x 30"	1										1	0		
30R3-7L	Left Lane Must Turn Left	30" x 30"	1										1	0		
24R4-7	Keep Right	24" x 30"	2										2	0		
36R1-2	Yield	36" x 36" x 36"	1										1	0		
	Type II Barricades	n/a	5										5	0		
SIGN TOTALS			27	19									27	19		

OTHER DEVICES / ITEMS			
CODE	LEGEND	UNIT	QUANTITY
630	Flagging	Hour	800
630	Uniformed Traffic Control ●	Hour	80
630	Traffic Control Management	Day	120
630	Barricade (Type 3 M-B) (Temporary)	Each	2
630	Construction Traffic Sign (Panel Size A)	Each	26
630	Construction Traffic Sign (Panel Size B)	Each	19
630	Advance Warning Sequencing or Flashing Arrow Panel (B Ty)	Each	2
630	Drum Channelizing Device	Each	30
630	Drum Channelizing Device (with Light) (Flashing)	Each	10
630	Traffic Cone	Each	150
630	Tubular Marker	Each	50

● Two officers assumed for Sheridan at South US-285 Ramps; one officer assumed all other locations

NOTES:

1. Pedestrian movements shall be fully addressed in the Contractor's TCP and MHT. No plan will be approved that unreasonably impedes or restricts pedestrian movements. No devices required to implement the contract requirements will be permitted to be installed on or above sidewalk surface areas unless otherwise approved in the respective TCP or MHT.
2. Pedestrian movement through all intersections shall be provided along at least one side of each street at all times.

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Print Date: 4/25/2012	Sheet Revisions			 DENVER <small>THE MILE HIGH CITY</small>	 Region 6	Colorado Department of Transportation 4670 N. Holly Denver, CO 80216 Phone: 303-398-6738 FAX: 303-398-6781	As Constructed		TRAFFIC SIGNAL PLAN SUMMARY OF CONSTRUCTION TRAFFIC CONTROL DEVICES			Project No./Code	
Drawing File Name: 26-tab-ctcd-1.dgn	Date:	Comments:	Init.				No Revisions:	SHE R600-391					
Horiz. Scale: 1:1							Revised:	Designer: SJS	Structure Numbers	18197			
Unit Information							Void:	Detailer: JRM		Sheet Number 69			
Unit Leader Initials							Sheet Subset:	Subset Sheets: TR26 of TR26					


CENTENNIAL ENGINEERING, INC.
 5420 Ward Road, Suite 125
 Arvada, CO 80002
 (720) 279-7250

CITY & COUNTY OF DENVER TRAFFIC ENGINEERING SERVICES

TRAFFIC SIGNAL STANDARDS

SHEET NAME	STD DWG NO
2011 TRAFFIC ENGINEERING SERVICES	16.1.0
TRAFFIC SIGNAL NOTES	16.1.1
LEGEND/KEY NOTES	16.1.2
SPAN WIRE SIGNAL DESIGN	16.1.3
MOUNTING HARDWARE	16.1.4
LOOP DETECTION	16.1.5
CONDUIT DETAILS	16.1.6
PULL BOXES	16.1.7
SIGNAL POLE FOUNDATION	16.1.8
MAST ARM POLE LOADS	16.1.9
MOUNTING DETAILS	16.1.10
TABLE DATA	16.1.11
LUMINAIRE DETAILS	16.1.12
PEDESTAL POLE DETAILS	16.1.13
POLE FOUNDATION DETAILS	16.1.14
FOUNDATIONS FOR XCEL FACILITIES	16.1.15
"P" CABINET BASE	16.1.16
"P" CABINET & BASE	16.1.17
"M" CABINET BASE	16.1.18
METER PEDESTAL CABINET DETAILS	16.1.19
METER PEDESTAL CABINET FOUNDATION AND BASE	16.1.20
FLASHING BEACON DETAILS	16.1.21
DRIVER'S FEEDBACK SIGN DETAILS	16.1.22
FLASHING BEACON & SIGN SHEET 1	16.1.23
FLASHING BEACON & SIGN SHEET 2	16.1.24

SIGN & MARKINGS STANDARDS

SHEET NAME	STD DWG NO
CROSSWALK LAYOUT DETAILS	16.2.1
PAVEMENT MARKING DETAILS SHEET 1	16.2.2
PAVEMENT MARKING DETAILS SHEET 2	16.2.3
BIKE LANE TYPICAL MARKING DETAILS	16.2.4
CENTRAL BUSINESS DISTRICT PAVEMENT MARKING DETAILS	16.2.5
SINGLE SIGN POST MOUNTING DETAILS	16.2.6
MULTIPLE SIGN POST MOUNTING DETAILS	16.2.7
ONE-WAY SIGN PLACEMENT DETAILS	16.2.8
TRAFFIC SIGN UTILITY POLE MOUNTING DETAIL	16.2.9
GROUND MOUNT STREET NAME SIGN INSTALLATION DETAIL	16.2.10
GROUND MOUNT STREET NAME SIGN DETAIL	16.2.11
OVERHEAD STREET NAME SIGNS (INSTALLED PRIOR TO APRIL, 2011)	16.2.12
OVERHEAD STREET NAME SIGNS (INSTALLED AFTER APRIL, 2011)	16.2.13
PARKING METER POST INSTALLATION	16.2.14
BARRICADE DETAILS	16.2.15

APPROVED:

B. R. Mee
CITY TRAFFIC ENGINEER

1-12-12
DATE

CITY & COUNTY OF DENVER

2011 TRAFFIC ENGINEERING SERVICES



STD DWG NO
16.1.0

DATE
1/12/12

TRAFFIC SIGNAL NOTES

GENERAL

- ITEM NUMBER REFERS TO THE APPROPRIATE SECTION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION – COLORADO DEPARTMENT OF TRANSPORTATION 2011.
- 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 TRAFFIC SIGNAL POLES WITH STREET LIGHTS ATTACHED AND STREET LIGHT POLES ARE OWNED AND MAINTAINED BY XCEL ENERGY. THEREFORE ALL SUBMITTALS FOR TRAFFIC SIGNAL POLES AND STREET LIGHT POLES SHALL BE MADE TO XCEL ENERGY AND CITY & COUNTY OF DENVER TRAFFIC ENGINEERING SERVICES. 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 TRAFFIC ENGINEERING SERVICES.
- XCEL ENERGY TO REMOVE ALL POLES WITH EXISTING STREET LIGHTING ATTACHED. THE CONTRACTOR SHALL REMOVE ALL OTHER SIGNAL EQUIPMENT INCLUDING SIGNAL POLES 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 THE TRAFFIC ENGINEERING SERVICES ENGINEER.
- ALL SALVAGED SIGNAL EQUIPMENT REMOVED REMAINS THE PROPERTY OF CITY & COUNTY OF DENVER AND MUST BE DELIVERED TO TRAFFIC ENGINEERING SERVICES AT 5440 ROSLYN STREET. COORDINATE WITH TRAFFIC ENGINEERING SERVICES PROJECT INSPECTOR AT 720-865-4000 PRIOR TO DELIVERY.
- NO TRAFFIC SIGNAL SHALL BE TURNED ON OR TURNED OFF ON A FRIDAY OR PRIOR TO A HOLIDAY WITHOUT PRIOR NOTIFICATION TO TRAFFIC ENGINEERING SERVICES (720-913-0801).

HARDWARE

- ALL OVERHEAD SIGNAL HEADS SHALL BE CONSTRUCTED OF DIE CAST ALUMINUM AND PAINTED DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056 (12" DIAMETER ONLY).
- POLY SIGNAL HEADS ARE REQUIRED FOR ALL SIDE MOUNT SIGNALS AND PEDESTRIAN SIGNALS. ALL POLY HEADS SHALL BE DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
- ALL HARDWARE INCLUDING SPACERS, ELBOWS, POLE PLATES AND PLUMBIZERS SHALL BE PAINTED DARK OLIVE GREEN IN CONFORMANCE WITH FEDERAL SPECIFICATION 14056.
- 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 SECTIONS).
- EXACT LOCATION OF THE SIGNAL POLES AND PEDESTALS SHALL BE DETERMINED IN THE FIELD BY CITY & COUNTY OF DENVER TRAFFIC ENGINEERING SERVICES.

CONSTRUCTION

- CONDUIT RUNS SHOWN AS $\langle 3D \rangle$ (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.
- TWO PULL BOXES TO BE INSTALLED AT LOCATIONS SHOWN AS $\langle 3H \rangle$ (2). DESIGNATE ON LID "TRAFFIC" FOR SIGNAL CABLES AND "ELECTRIC" FOR ELECTRIC UTILITY CABLES BY PHYSICALLY EMBOSsing, NOT PAINTING. PULL BOX LIDS FOR COMMUNICATION CONDUITS $\langle 3H \rangle$ (SPECIAL) SHALL BE DESIGNATED "TRAFFIC COMM" BY PHYSICALLY EMBOSsing, NOT PAINTING. SEE STD. DWG. NO. 16.1.7 FOR PULL BOX DIMENSIONS.
- 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.
- INTERCONNECT CONDUIT PULL BOXES SHALL BE PLACED AT 500 FOOT MAXIMUM SPACING, OR OTHERWISE DIRECTED BY CITY & COUNTY OF DENVER ENGINEER.
- INSTALL WATER VALVE PULL BOX $\langle 3P \rangle$ AND 2 INCH SCHEDULE 80 PVC CONDUIT FOR LOOP DETECTION INTERCEPT WHERE SHOWN ON PLANS. SEE STD DWG NO 16.1.5.
- ALL HOLES IN TRAFFIC SIGNAL POLES TO BE DRILLED OR SAWED. INSTALLING HOLES BY BURNING WITH A TORCH IS NOT APPROVED.
- THE BOTTOM OF ALL SPAN WIRE 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 THE CROWN OF PAVEMENT SURFACE, UNLESS OTHERWISE SPECIFIED BY TRAFFIC ENGINEERING SERVICES. ALL SPAN WIRE SHALL INCLUDE A BOTTOM WIRE OR WIND TETHER.
- 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.
- ANCHOR BOLTS SHALL NOT BE TRIMMED UNTIL SIGNAL POLE BASE ELEVATION IS APPROVED BY CITY & COUNTY OF DENVER ENGINEER.

WIRING

- ALL TRAFFIC SIGNAL WIRE CONNECTORS SHALL BE OF THE BUCHANNAN COMPRESSION TYPE WITH COPPER NONFERROUS CONNECTORS AND IDEAL WRAP-CAPS OR APPROVED EQUAL.
- 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.
- THREE (3) SPARE CONDUCTORS SHALL BE PROVIDED TO EACH PULL BOX AND TO THE END OF EACH MAST ARM.
- ALL SOLDERLESS CONNECTORS SHALL BE USED.
- BARE WIRE IN OPTICOM CABLE SHALL BE SHRINK TUBED ON BOTH ENDS FOR TOTAL INSULATION.

SIGNING

- 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 BOLTED ON 18 INCH TELSPAR EXTENSION WHICH CONNECTS TO MAST ARM BY USE OF ADAPTER SCREWED INTO HOUSING.
- CONTRACTOR SHALL NOT REMOVE ANY REGULATORY TRAFFIC SIGNS UNLESS SPECIFIED ON PLANS. CITY AND COUNTY OF DENVER, TRANSPORTATION DIVISION TO BE NOTIFIED 48 HOURS PRIOR TO ANY SIGNING CHANGES AT 720-865-3150
- 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.

CITY & COUNTY OF DENVER

TRAFFIC SIGNAL NOTES

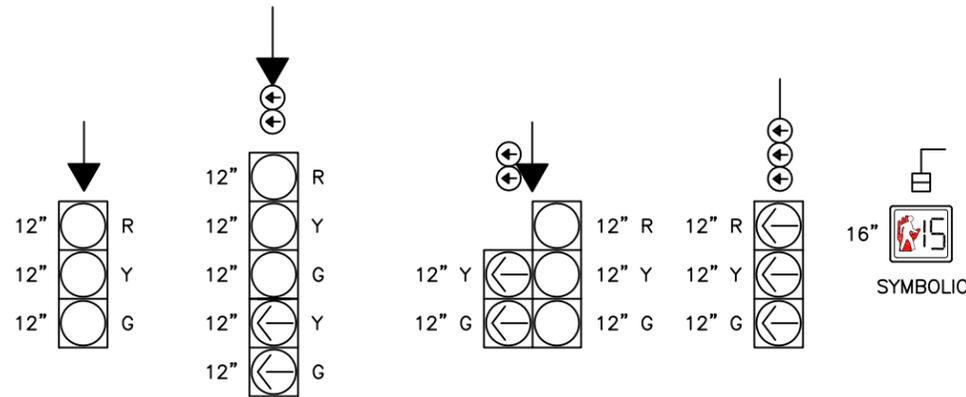


STD DWG NO
16.1.1

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ELECTRICAL SERVICE LEGEND

- CONTROLLER CABINET-EXISTING
- CONTROLLER CABINET-NEW (DARKENED PORTION INDICATES DOOR SIDE OF CABINET)
- PULL BOX-EXISTING
- PULL BOX-NEW
- ⊗ WATER VALVE PULL BOX
- ▭ LOOP DETECTOR (LENGTH AS SPECIFIED)
- POLE-EXISTING
- POLE OR PEDESTAL-NEW
- OPTICOM
- ← DOWN GUY
- UNDERGROUND CONDUIT-EXISTING
- UNDERGROUND CONDUIT-NEW
- LUMINAIRE
- PBW-L or R PEDESTRIAN PUSH BUTTON, LEFT OR RIGHT ARROW."WAIT FOR WALK SIGNAL"
- ↓ MAST ARM (LENGTH AS SPECIFIED, SHOWING SIGNAL WITH BACKPLATE)
- ↔ SPAN-WIRE MOUNTED (SHOWING SIGNAL WITH BACKPLATE)
- ↔ ↓ PEDESTAL OR SIDE BRACKET MOUNTED (SHOWING SIGNAL WITHOUT BACKPLATE)
- VD VIDEO DETECTION CAMERA
- ⊥ RADIO ANTENNA
- ⊥ MICROWAVE DETECTOR
- ⊥ POLE MOUNTED SIGN
- ⊥ SPAN WIRE MOUNTED SIGN
- ⊥ MAST ARM MOUNTED SIGN
- CCTV CLOSED CIRCUIT TELEVISION CAMERA
- BOS BLANK OUT SIGN
- VMS VARIABLE MESSAGE SIGN
- EM ELECTRIC METER



KEY NOTES

REMOVALS

- 1A REMOVE SIGNAL HEAD
- 1B REMOVE SIGNAL POLE
- 1D REMOVE SIGNAL CABINET, CONTROLLER, PULL BOXES & WATER VALVE PULL BOXES
- 1E REMOVE MAST ARM
- 1F REMOVE SPAN WIRE, CABLE AND ALL ATTACHED SIGNAL HEADS AND EQUIPMENT
- 1G REMOVE PUSH BUTTON
- 1H ELECTRIC UTILITY COMPANY TO REMOVE EXISTING POLE

RESETS

- 2A RESET SIGNAL HEAD
- 2B RESET SIGNAL POLE
- 2C RESET SIGNAL CONTROLLER, CABINET AND ASSOCIATED EQUIPMENT
- 2D RESET PUSH BUTTON
- 2G RESET SPAN WIRE
- 2H RESET SPAN WIRE AND ALL ATTACHED SIGNAL EQUIPMENT
- 2J RESET DETECTOR
- 2K ELECTRIC UTILITY COMPANY TO RESET EXISTING POLE

INSTALLATIONS

- 3A INSTALL SIGNAL HEAD OR HEADS
- 3B INSTALL SIGNAL CABINET, CONTROLLER AND ASSOCIATED EQUIPMENT
- 3C INSTALL PUSH BUTTON
- 3D INSTALL CONDUIT
- 3D (3) INSTALL THREE CONDUITS (TWO 3-INCH CONDUITS AND ONE 2-INCH CONDUIT)
- 3E INSTALL SIGNAL POLE
- 3F INSTALL MAST ARM - (LENGTH AS SHOWN)
- 3G INSTALL SPAN WIRE
- 3H (SPECIAL) INSTALL PULL BOX MARKED "TRAFFIC COMM" ON LID
- 3H (2) INSTALL TWO PULL BOXES ONE MARKED "TRAFFIC" ONE MARKED "ELECTRIC" ON LIDS
- 3J INSTALL DETECTOR
- 3K ELECTRIC UTILITY COMPANY TO INSTALL SIGNAL POLE
- 3L ELECTRIC UTILITY COMPANY TO INSTALL POWER FEED. CONTRACTOR TO EXTEND TO CONTROLLER
- 3M ELECTRIC UTILITY COMPANY TO INSTALL LUMINAIRE
- 3N INSTALL LUMINAIRE
- 3P INSTALL WATER VALVE PULL BOX
- 3Q NO CHANGE
- 3S INSTALL STREET LIGHT STANDARD
- 3T INSTALL OPTICOM
- 3U INSTALL INTERCONNECT (SIZE & TYPE AS SHOWN)
- 3V INSTALL VIDEO DETECTION CAMERA
- 3W INSTALL ELECTRIC METER

CITY & COUNTY OF DENVER

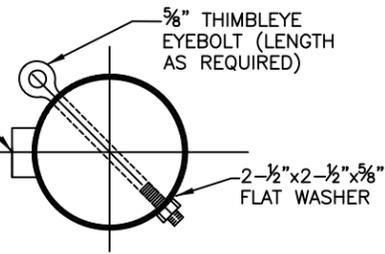
LEGEND/KEY NOTES



STD DWG NO
16.1.2

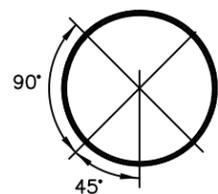
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3" CLOSE COUPLING FOR SIGNAL CABLE WEATHER HEAD (FOR MULTIPHASE INSTALLATIONS PROVIDE AN ADDITIONAL COUPLING ON POLE ADJACENT TO CONTROL CABINET)



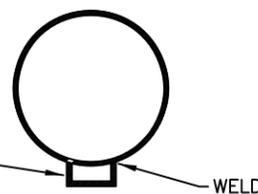
HOLE SPACING

CONTRACTOR TO DRILL OR TORCH (IF APPROVED) ALL HOLES REQUIRED FOR COMPLETE SIGNAL INSTALLATION.



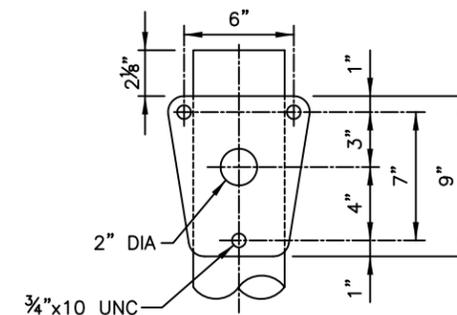
SECTION A-A

3" CLOSE NIPPLE AND WEATHER HEAD FOR SIGNAL CABLE



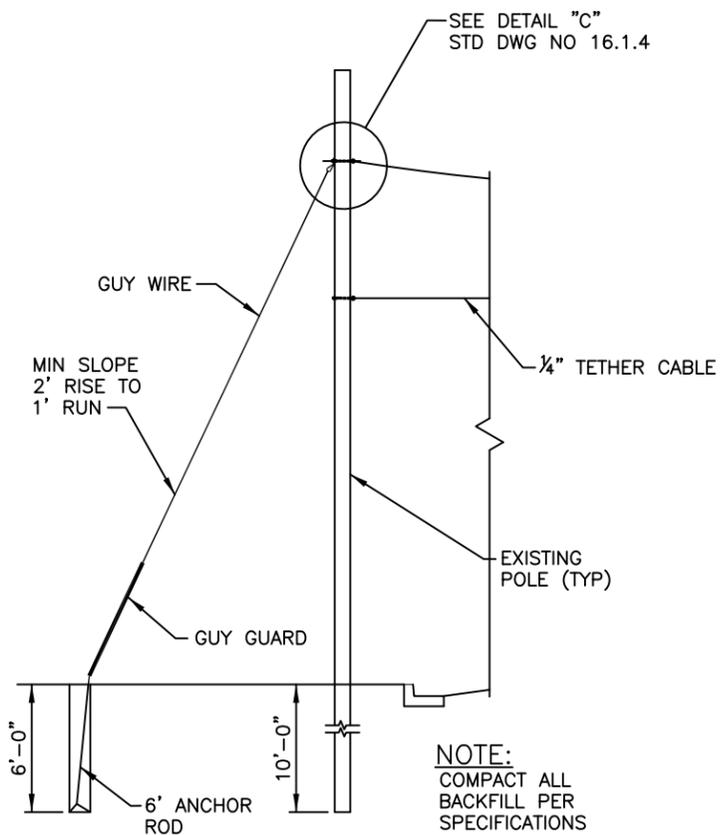
SECTION B-B

NOTE:
SEE SECTION 614.10 (C) OF CDOT STANDARD SPECIFICATIONS FOR BONDING AND GROUNDING SPECIFICATIONS

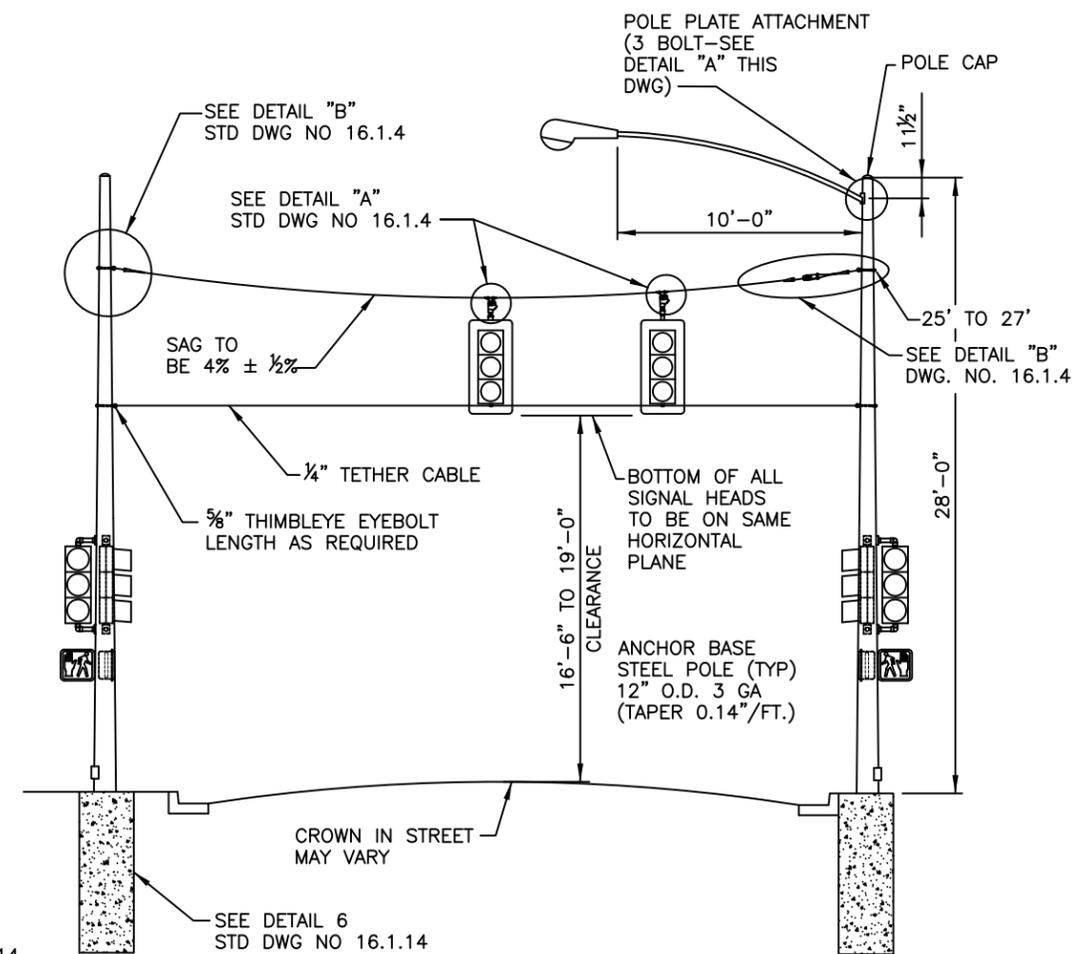
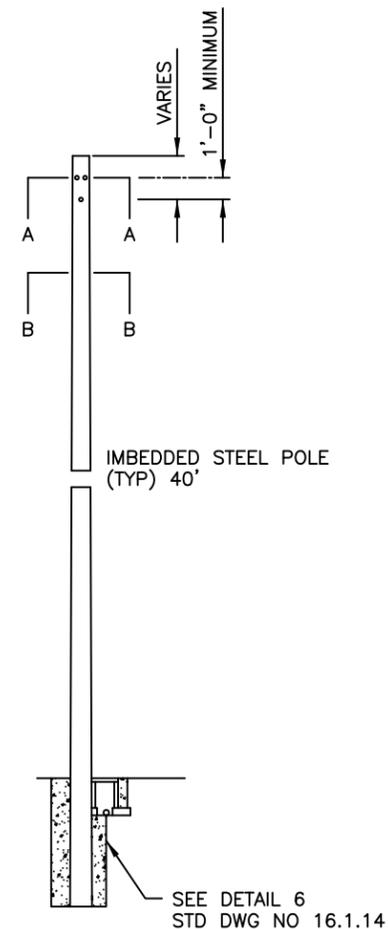


DETAIL "A"
LUMINAIRE POLE PLATE ATTACHMENT

TYPICAL STRAIN POLE



EXISTING STRAIN POLE WITH SPAN WIRE



STEEL POLE WITH SPAN WIRE FOR BOX DESIGN

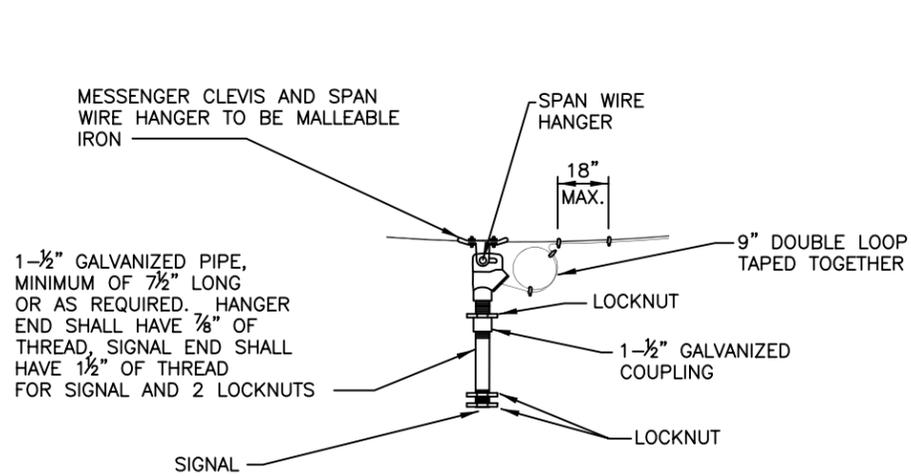
CITY & COUNTY OF DENVER

SPAN WIRE SIGNAL DESIGN

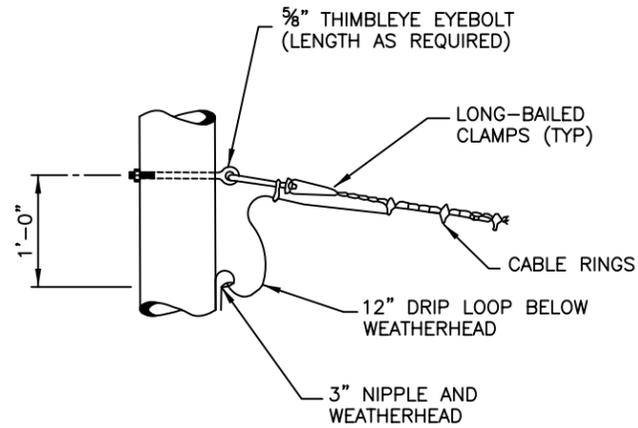


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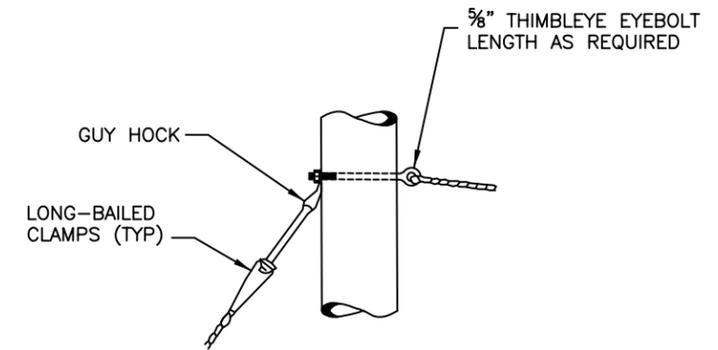
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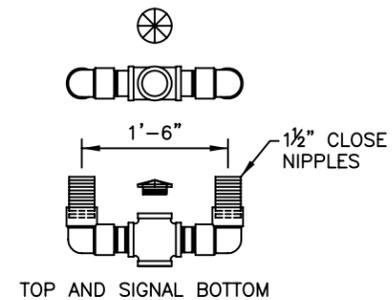
DETAIL "A"
SPAN WIRE MOUNTING



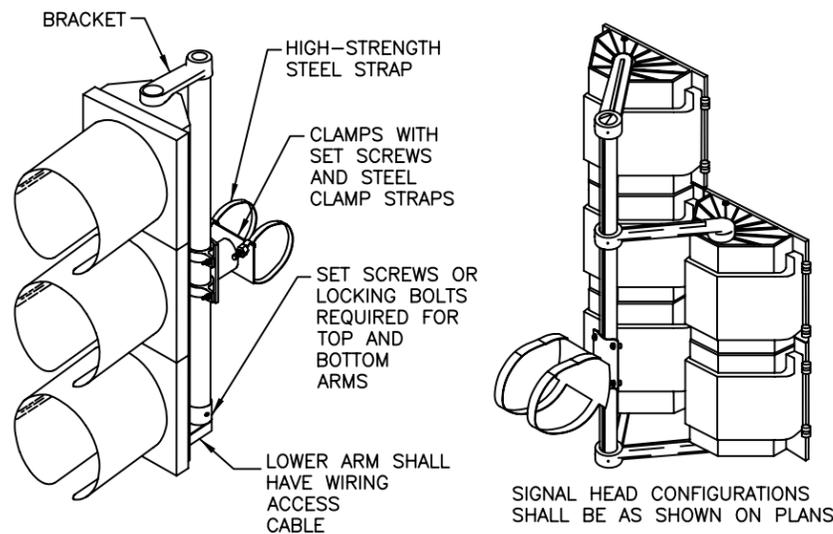
DETAIL "B"
CABLE INSTALLATION WITHOUT
INSULATOR-STEEL POLE



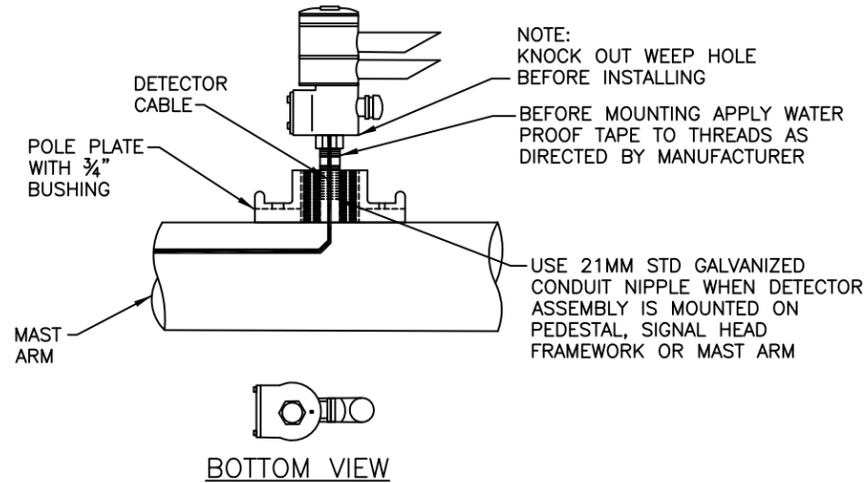
DETAIL "C"
CABLE INSTALLATION
ELECTRIC UTILITY POLE



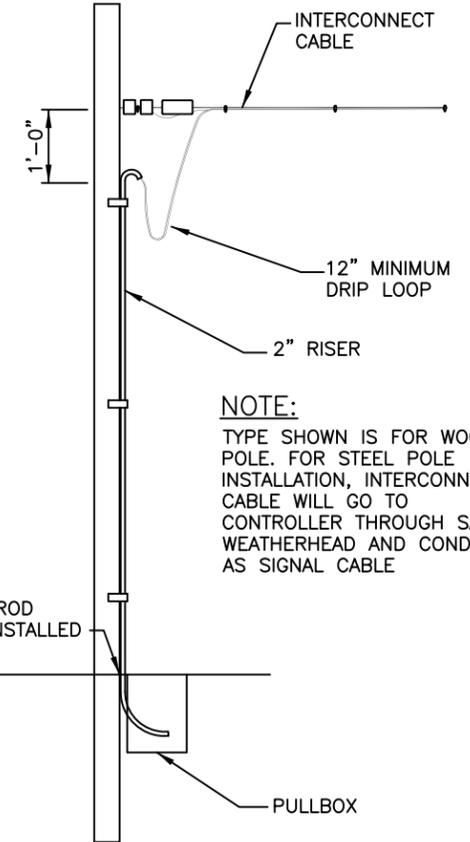
2 WAY "L" HOLLOW SPACER



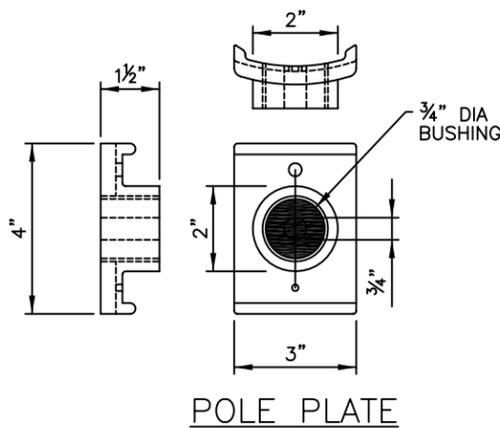
ASTRO-TYPE MOUNTING BRACKET



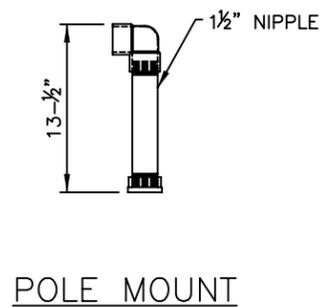
FIRE PRE-EMPTION DETECTION UNIT
MASTARM MOUNTING



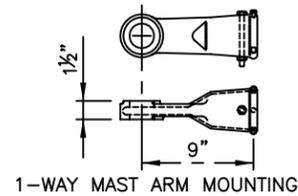
RISER INSTALLATION
FOR INTERCONNECT CABLE



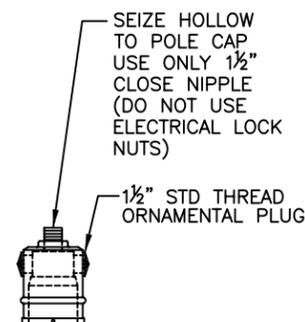
POLE PLATE



POLE MOUNT



ELEVATOR PLUMBIZER



SLIP FITTER

CITY & COUNTY OF DENVER

MOUNTING HARDWARE



STD DWG NO
16.1.4

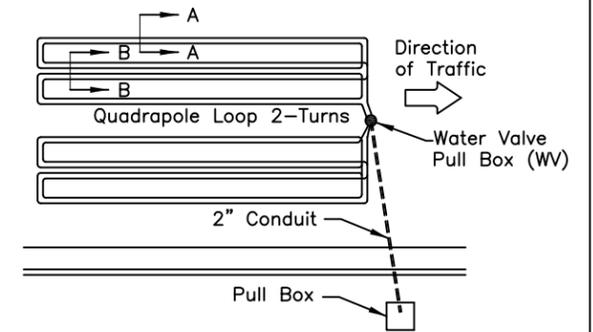
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GENERAL NOTES

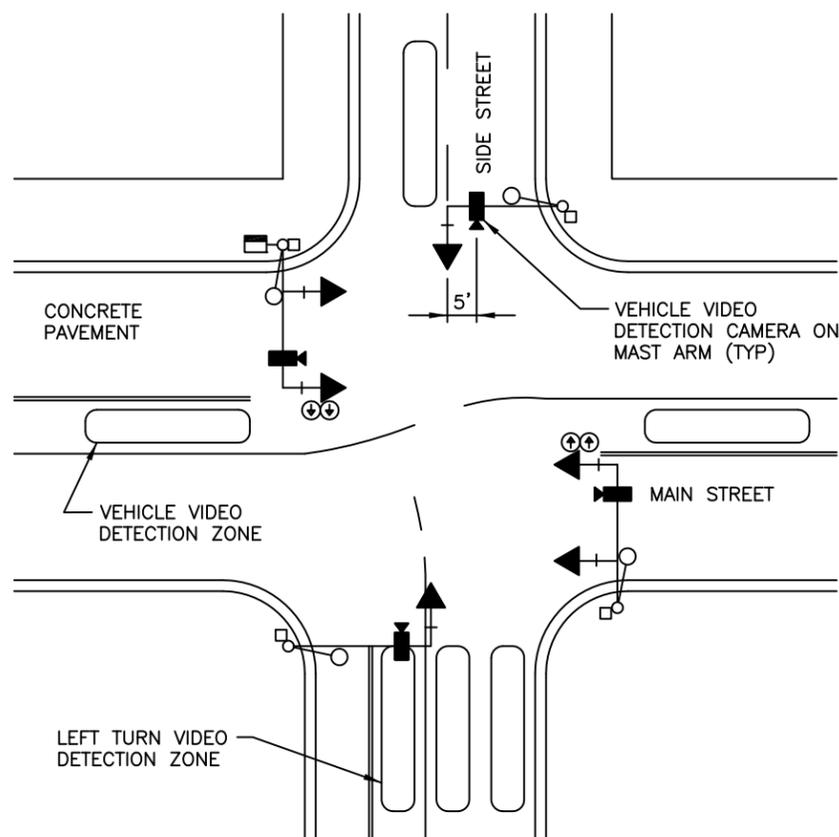
1. LOOP DETECTORS SHALL BE INSTALLED WITH THE NUMBER OF TURNS OF WIRE AND IN THE CONFIGURATION SHOWN ON SCHEMATIC. A COMPLETE INSTALLATION CONSISTS OF A LOOP OR GROUP OF LOOPS INSTALLED IN THE ROADWAY, LEAD-IN CABLE, AND A DETECTOR UNIT INSTALLED IN A TRAFFIC SIGNAL CONTROLLER CABINET.
2. LOOP WIRES SHALL BE BROUGHT OUT TO THE NEAREST SIGNAL POLE OR PULL BOX AND EXISTING UNDERGROUND CONDUIT OR OVERHEAD MESSENGER WIRE USED FOR LEAD-IN CABLE TO CONTROL CABINET.
3. THE LOOP DETECTOR WIRES SHALL BE SPLICED TO THE LEAD-IN CABLE USING WATER PROOF SPLICE DEVICES.
4. ALL LOOP WIRES SHALL BE CLEARLY IDENTIFIED AT THE CONNECTION POINT BY LETTERING FROM THE ROADWAY CENTER.
5. NO BACKER ROD OR FILLER MATERIAL SHALL BE USED IN THE SAW CUT.
6. THE SAW CUT SHALL BE MADE $\frac{3}{8}$ -INCHES WIDE AND A MINIMUM OF 3 INCHES DEEP. THE SLOT SHALL BE AS STRAIGHT AS POSSIBLE AND SHALL NOT VARY MORE THAN $\frac{1}{2}$ -INCH WHEN CHECKED WITH A 10 FOOT STRAIGHTEDGE. NO SAWING SHALL BE STARTED UNTIL LAYOUT OF LOOP IS CHECKED AND APPROVED BY THE ENGINEER'S REPRESENTATIVE.
7. SAW CUTS SHALL BE WASHED AND BLOWN DRY AND CLEANED PRIOR TO PLACEMENT OF WIRE. CORNERS OF LOOPS SHALL BE DRILLED 3-INCHES DEEP WITH 2-INCH DIAMETER. SEE DRILLED CORNER DETAIL.
8. AFTER SAW CUT IS CLEANED OF DEBRIS THE WIRE SHALL BE PLACED BY PUSHING IT INTO THE SLOT WITH A BLUNT NON-METALLIC OBJECT. A SCREWDRIVER OR OTHER SHARP TOOL SHALL NOT BE USED.
9. BEFORE THE LOOP SYSTEM IS SEALED THE LOOP SHALL BE CHECKED FOR ELECTRICAL CONTINUITY BY TESTING FOR INDUCED AC VOLTAGE, INDUCTANCE, AND RESISTANCE.
10. LOOPS SHALL BE SEALED USING SEALER AS DESCRIBED IN THE MATERIAL REQUIREMENTS AND SHOWN IN THE DETAILS.
11. WHEN POSSIBLE INSTALL LOOP UNDER CONCRETE PAVING BY STAKING WITH PLASTIC TENT STAKES OR REBAR CHAIRS AT THE DIRECTION OF THE ENGINEER.
12. LOOPS SHALL BE INSTALLED PRIOR TO FINAL LIFT OF ASPHALT.
13. PREFORMED LOOPS MAY BE USED AT THE DIRECTION OF THE ENGINEER.
14. BICYCLE DETECTION LOOPS SHALL BE LAYOUT AND INSTALLED IN THE SAME MANNER AS A VEHICLE LOOPS.

MATERIAL REQUIREMENTS

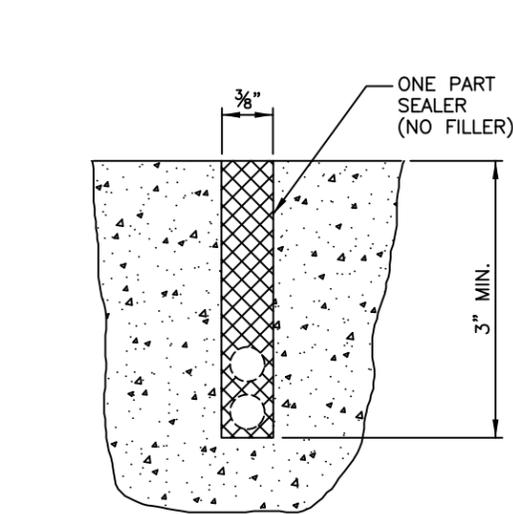
1. THE LOOP WIRE SHALL BE NO. 14 AWG, STRANDED SINGLE CONDUCTOR, CROSSLINKED POLYETHYLENE INSULATION WHICH IS PROTECTED BY A CONTINUOUS FLEXIBLE VINYL OR POLYETHYLENE PLASTIC TUBING.
2. LOOP LEAD-IN CABLE SHALL BE 4/C AWG#18 STRANDED COPPER WIRE SHIELDED WITH POLYETHYLENE JACKET AND INSULATION IN ACCORDANCE WITH 3M SPECIFICATION NO 30003.
3. ROADWAY LOOP EMBEDDING SEALER SHALL BE USED TO ENCAPSULATE THE LOOP WIRES. THE SEALER SHALL BE ONE PART COMPONENT SYSTEM WHICH IS PLACED UNDER PRESSURE USING A CONVENTIONAL CARTRIDGE GUN OR BULK HANDLING PUMP EQUIPMENT. SEALER SHALL HAVE A VISCOSITY WHICH WILL COMPLETELY ENCAPSULATE THE WIRES AND WILL REMAIN PERMANENTLY FLEXIBLE WITH AGE. SEALER SHALL BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING WORK.



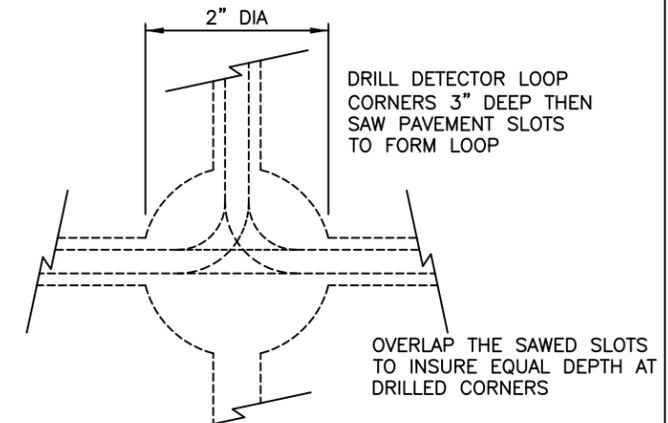
TYPICAL LOOP WIRING SCHEMATIC



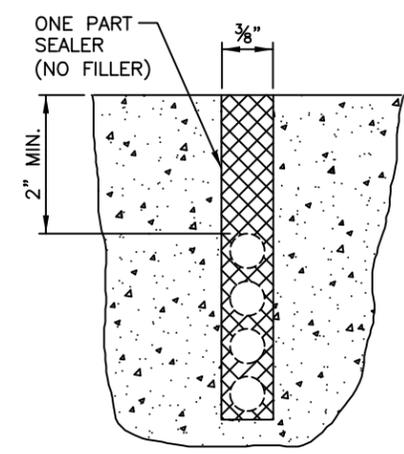
TYPICAL VIDEO CAMERA LOCATION DETAIL



SECTION A-A

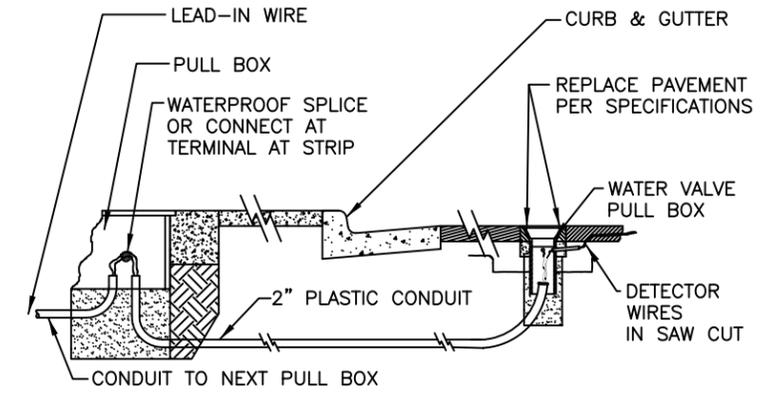


DRILLED CORNER DETAIL



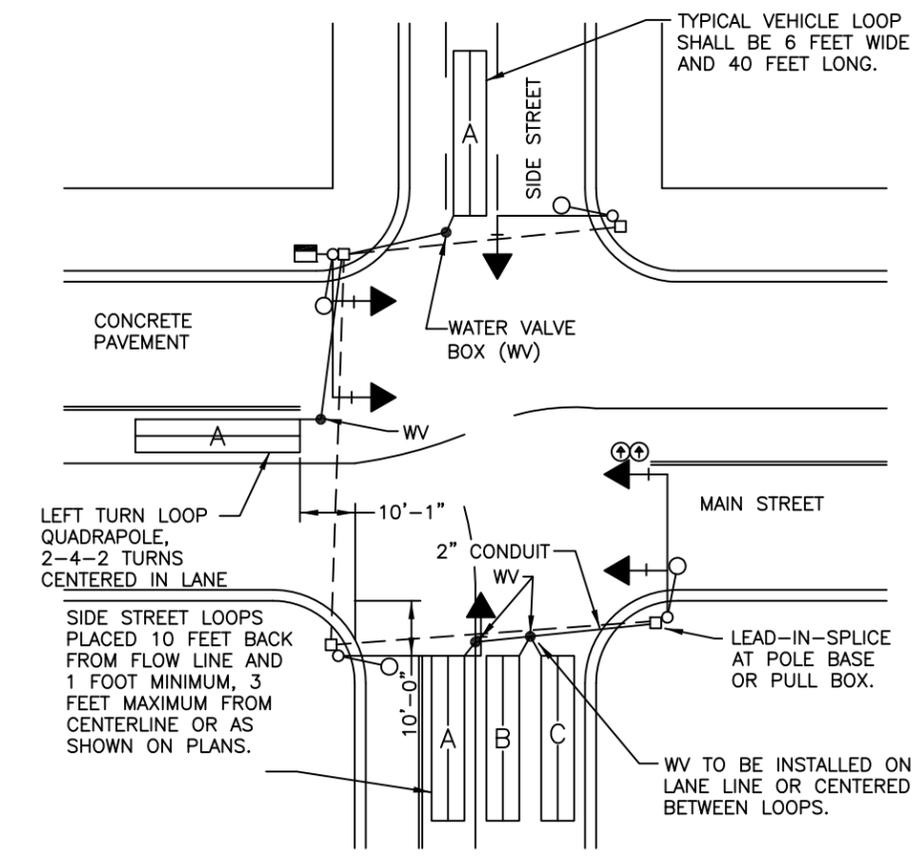
SECTION B-B

SAWED SLOT DETAILS



EACH PAIR OF LOOP LEAD-IN DETECTOR WIRES SHALL BE TWISTED 3 TURNS PER FOOT THROUGH CONDUIT.

LOOP DETECTOR LEAD-IN FOR WATER VALVE PULL BOX



TYPICAL LOOP LOCATION DETAIL

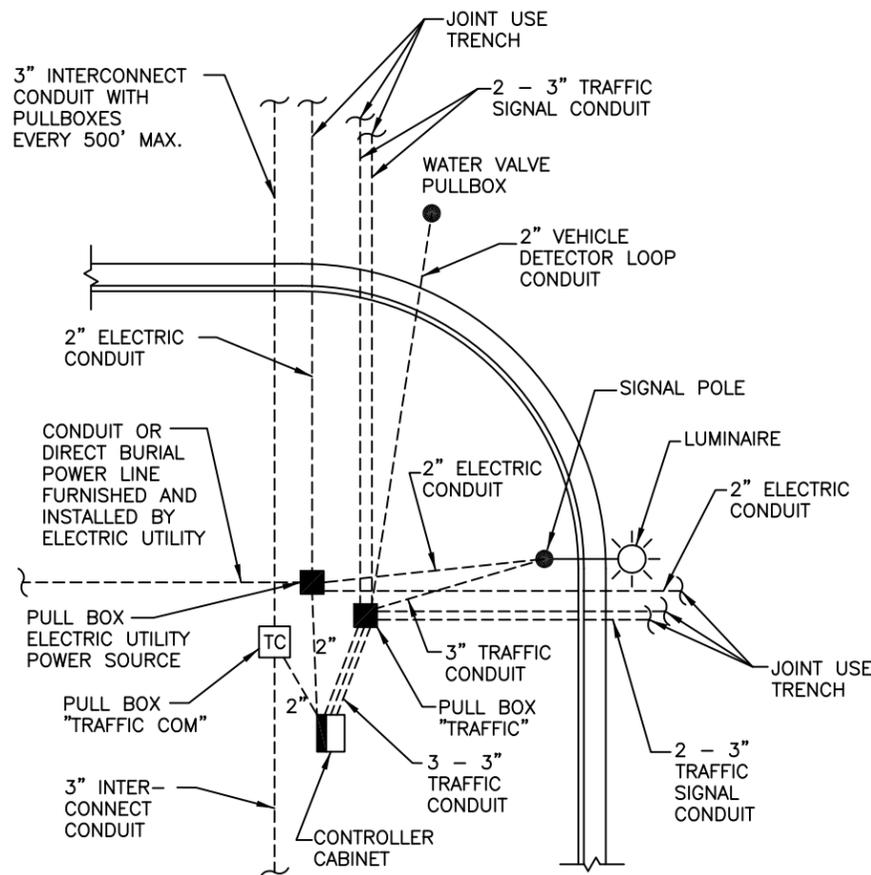
CITY & COUNTY OF DENVER

LOOP DETECTION

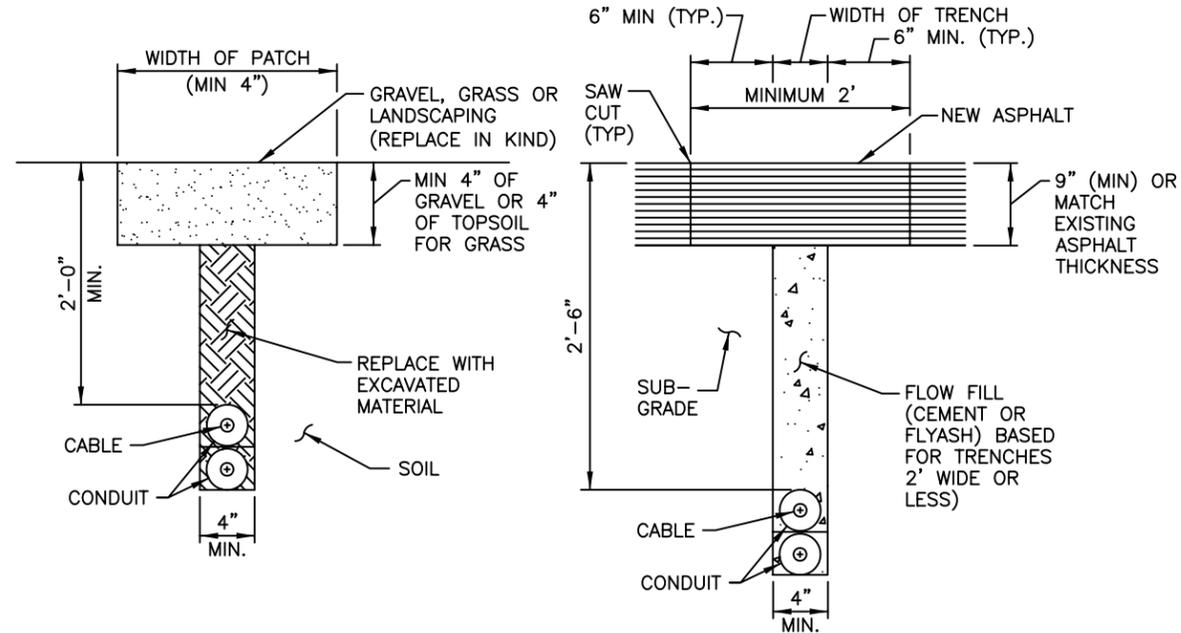


STD DWG NO
16.1.5

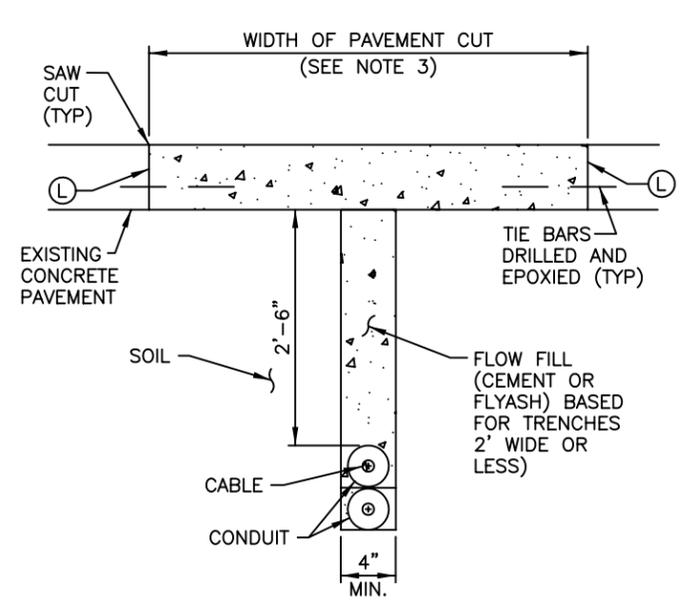
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POWER SOURCE DETAILS



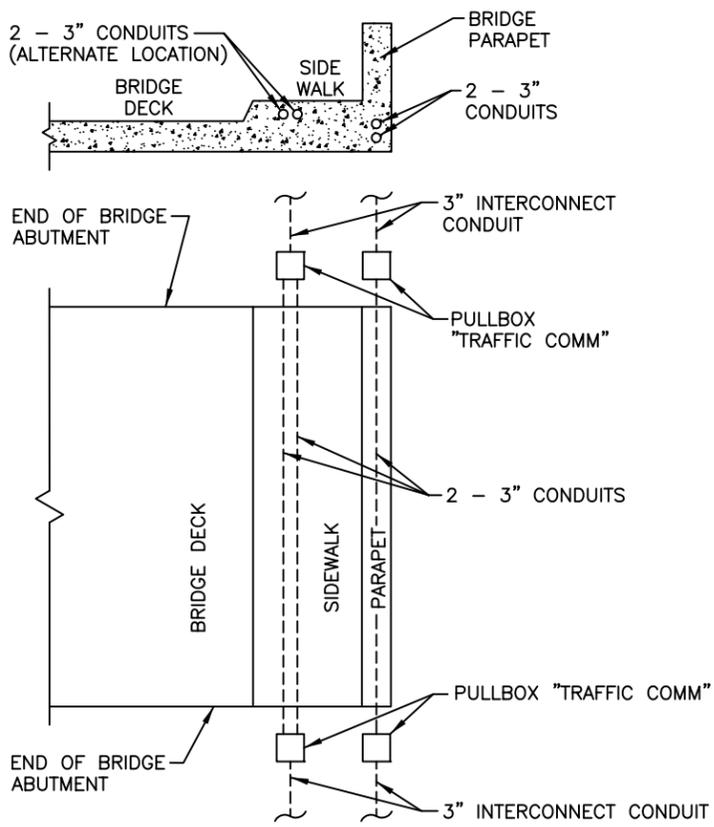
TRENCH PATCH (GRAVEL OR LANDSCAPED) TRENCH PATCH (ASPHALT)
TRENCH PATCH (ASPHALT/MISC MATERIALS)



TRENCH PATCH (CONCRETE)

NOTES:

1. WHEREVER POSSIBLE CONDUIT OR CABLE SHALL BE INSTALLED BY BORING, DRIVING OR ANY OTHER ACCEPTABLE MEANS UNDER CONCRETE UNITS AND OPEN CUTTING SHALL BE USED ONLY UNDER SPECIAL CIRCUMSTANCES AND ONLY AFTER APPROVAL BY THE CITY.
2. THIS DETAIL APPLIES TO ALL CONCRETE STREETS, ALLEYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAYS.
3. LIMITS OF CONCRETE PAVEMENT REMOVAL:
 - A. FOR CONCRETE PAVEMENT LESS THAN 3 YEARS OLD, ENTIRE PANEL SHALL BE REMOVED.
 - B. FOR PAVEMENT OLDER THAN 3 YEARS, THE FOLLOWING APPLIES:
 - ONE REMOVAL LIMIT SHALL FOLLOW AN EXISTING JOINT, WHEN POSSIBLE.
 - IF NEITHER LIMIT OF REMOVAL FOLLOWS AN EXISTING LINE, THE LIMITS OF REMOVAL SHALL BE 4' FROM AN EXISTING JOINT, OR THE REMOVAL SHALL BE EXTENDED TO THE EXISTING JOINT.
 - THE MINIMUM WIDTH OF PAVEMENT REMOVAL SHALL BE 4'.
4. A CONSTRUCTION JOINT SHALL BE USED TO TIE THE CONCRETE PATCH TO EXISTING CONCRETE ON ALL SIDES EXCEPT WHERE LIMITS MATCH AN EXISTING TRANSVERSE CONSTRUCTION JOINT. TIE BARS SHALL BE ELIMINATED AT TRANSVERSE CONTRACTION JOINTS.
5. THE LIMITS OF CONCRETE PATCHING SHALL BE PERPENDICULAR OR PARALLEL TO THE CENTERLINE OF THE STREET. SKEWED TRENCHES ARE NOT PERMITTED.

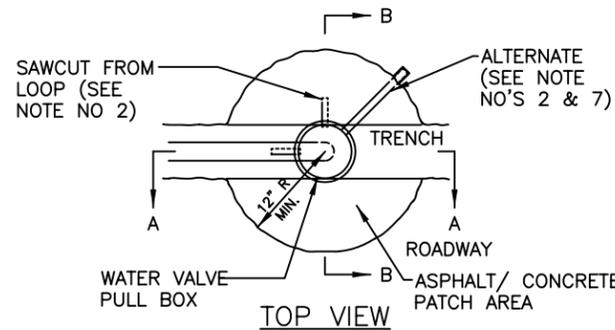


INTERCONNECT CONDUIT PLACEMENT ON BRIDGE

NOTE:
PULLBOXES SHALL BE PLACED AS CLOSE AS PRACTICAL TO THE ENDS OF THE BRIDGE AND BE FLUSH WITH SIDEWALK OR FINISHED GRADE SURFACE.

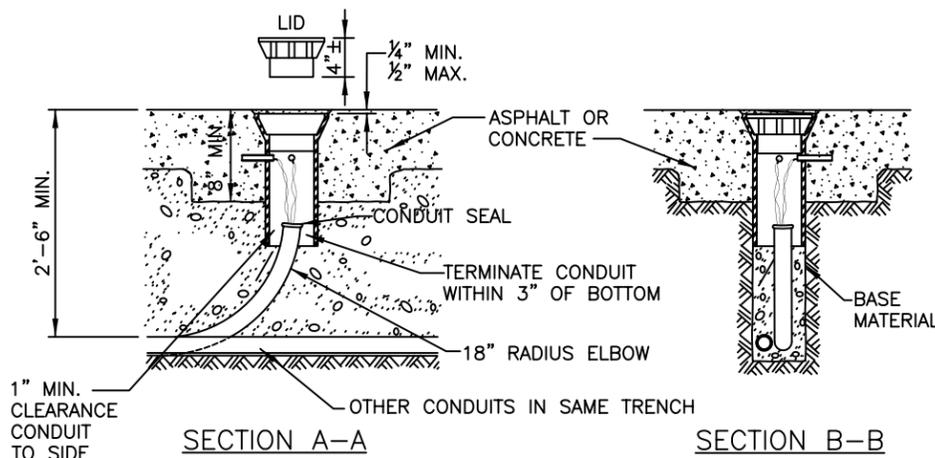
NOTES:

1. SEE CDOT STANDARDS M-613-1 AND S-614-10(C).
2. FOR STREET LIGHT LUMINAIRES ON SPAN WIRE INSTALLATIONS - TWO (2) NUMBER 12 AGW COPPER TW INSULATED BUILDING WIRES SHALL BE INSTALLED BY THE CONTRACTOR FROM THE END OF THE LUMINAIRE ARM, THROUGH THE POLE, ALONG THE SPAN WIRE CABLE TO THE SIGNAL POLE NEAREST THE CONTROLLER CABINET, THRU THE POLE WITH APPROXIMATELY 5 FEET OF EXTRA WIRING COILED IN THE PULL BOX AT THE BASE OF THE POLE.
3. FOR STREET LIGHT LUMINAIRES ON MAST ARM INSTALLATION - TWO (2) NUMBER 12 AGW COPPER TW INSULATED BUILDING WIRES SHALL BE INSTALLED BY THE CONTRACTOR FROM THE END OF THE LUMINAIRE ARM, THROUGH THE POLE WITH APPROXIMATELY 5 FEET OF EXTRA WIRING COILED IN THE PULL BOX AT THE BASE OF POLE. THE CONTRACTOR SHALL ALSO INSTALL #4 ALUMINUM TRIPLEX FROM THE PULL BOX AT THE BASE OF THE SIGNAL POLE NEAREST THE CONTROLLER CABINET THROUGH CONDUIT NETWORK TO THE PULL BOXES AT OTHER SIGNAL POLES WITH LUMINAIRES.
4. ALL WIRING FOR LUMINAIRES SHALL BE INCLUDED IN WORK AND NOT PAID FOR SEPARATELY.
5. SPLICES OF LUMINAIRE WIRING SHALL BE DONE BY ELECTRIC UTILITY AT THE POWER SOURCE.
6. WIRING FOR STREET LIGHT LUMINAIRES SHALL BE TAGGED PER STANDARD SPECIFICATIONS.
7. ALL POLES SHALL BE GROUNDED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC).
8. ALL HDPE CONDUITS SHALL BE JOINED WITH THE APPROPRIATE HDPE COUPLINGS.
9. ALL ELECTRICAL SYSTEMS SHALL BE PROPERLY GROUNDED IN ACCORDANCE WITH THE SPECIFICATIONS. A 5/8" X 8" COPPER GROUND ROD SHALL BE INSTALLED IN ALL PULL BOXES. CONTROLLER CABINETS SHALL BE GROUNDED TO NEAREST TRAFFIC SIGNAL PULL BOX.
10. ALL CONDUITS AND POLES SHALL BE ELECTRICALLY BONDED WITH #10 COPPER WIRE AND CONTAIN A PULL STRING LOCATE WIRE. INTERCONNECT CONDUITS SHALL HAVE INSTALLED A SINGLE #14 INSULATED CONDUCTOR AND MULE TAPE.

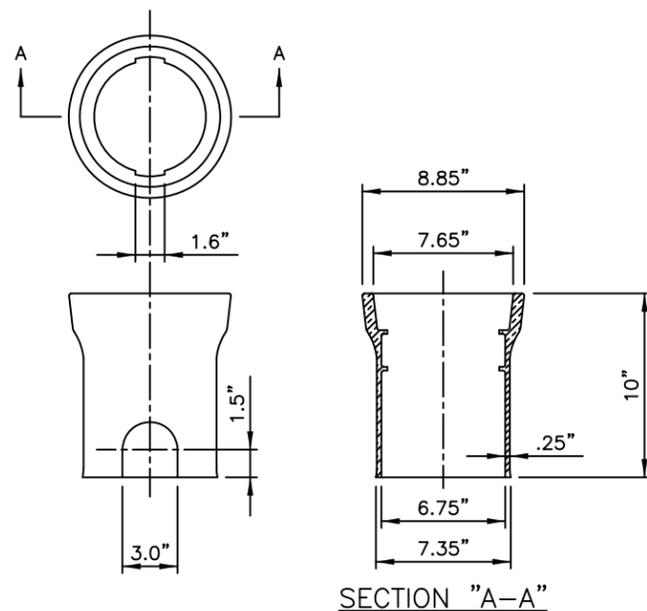


WATER VALVE PULL BOX NOTES:

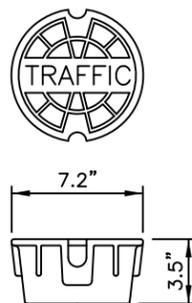
1. WATER VALVE PULL BOX SHALL BE A WATER VALVE STEM TYPE PULL BOX MADE OF CAST IRON. THE PULL BOX ITSELF SHALL HAVE CAPABILITY OF ACCEPTING RISER RINGS FOR FUTURE OVERLAYS. THE LID SHALL BE CAST IRON OR STEEL AND HAVE THE WORD "TRAFFIC" PRINTED ON IT.
2. PULL BOXES SHALL HAVE 3/4" TO 1" DIAMETER HOLES DRILLED OR TORCHED 3". FROM TOP TO ACCEPT A LOOP DETECTOR WIRE FLEXIBLE VINYL OR POLYETHYLENE TUBING. THE NUMBER OF HOLES SHALL BE AS PER PLANS OR AS DIRECTED BY THE ENGINEER.
3. CARE SHALL BE TAKEN DURING BACK FILL COMPACTION TO PREVENT COLLAPSE OF THE TUBES.
4. A MINIMUM 2 FEET OF SLACK IS TO BE PROVIDED ON BOTH FEED AND LOOP WIRES SO THAT ALL TESTING AND SPLICING CAN BE DONE OUTSIDE THE PULL BOX.
5. PULL BOX IS TO BE LOCATED IN AN AREA OF THE STREET NOT HEAVILY TRAVELED, IF POSSIBLE, AND A MINIMUM OF 12" FROM THE CONCRETE GUTTER PAN.
6. IF HOT ASPHALT IS NOT AVAILABLE, A CONCRETE RING (12" MINIMUM RADIUS AND 8" MINIMUM DEPTH) MAY BE USED AT THE DIRECTION OF THE ENGINEER.



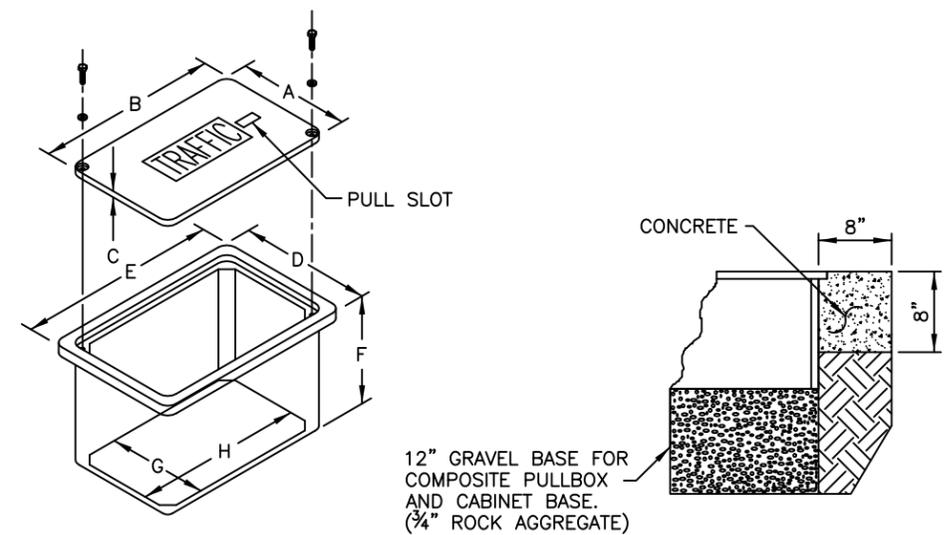
WATER VALVE PULL BOX FOR LOOP DETECTOR WIRE



WATER VALVE PULL BOX



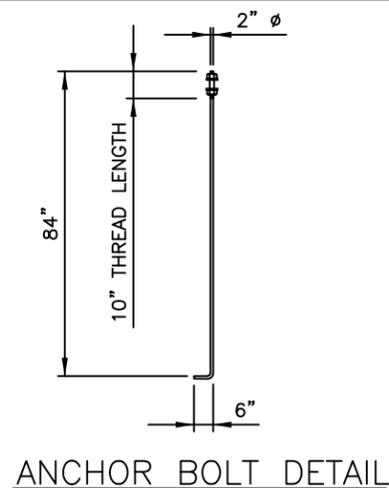
WATER VALVE PULL BOX LID



PULL BOXES AND COVERS SHALL BE COMPLETELY MADE OF FIBERGLASS REINFORCED POLYMER CONCRETE DESIGNED TO ANSI/SCTE 77 2007 TIER 22 "SPECIFICATIONS FOR UNDERGROUND ENCLOSURES INTEGRITY".

PRECAST PULL BOX

DESCRIPTION	TABLE OF DIMENSIONS FOR PRECAST PULL BOX								COMMENTS
	DIMENSIONS (IN.)								
	A	B	C	D	E	F	G	H	
TYPE A (ELECTRIC)	13-3/4"	23-1/4"	2"	15-1/2"	25"	12"	10-1/4"	19-1/4"	
TYPE B (TRAFFIC)	17-1/2"	30-1/2"	2"	19-1/4"	32-1/4"	12"	13-1/2"	26-1/2"	
TYPE C (COMM)	22-1/4"	34-1/4"	2"	24"	36"	24"	19-3/4"	30-1/4"	



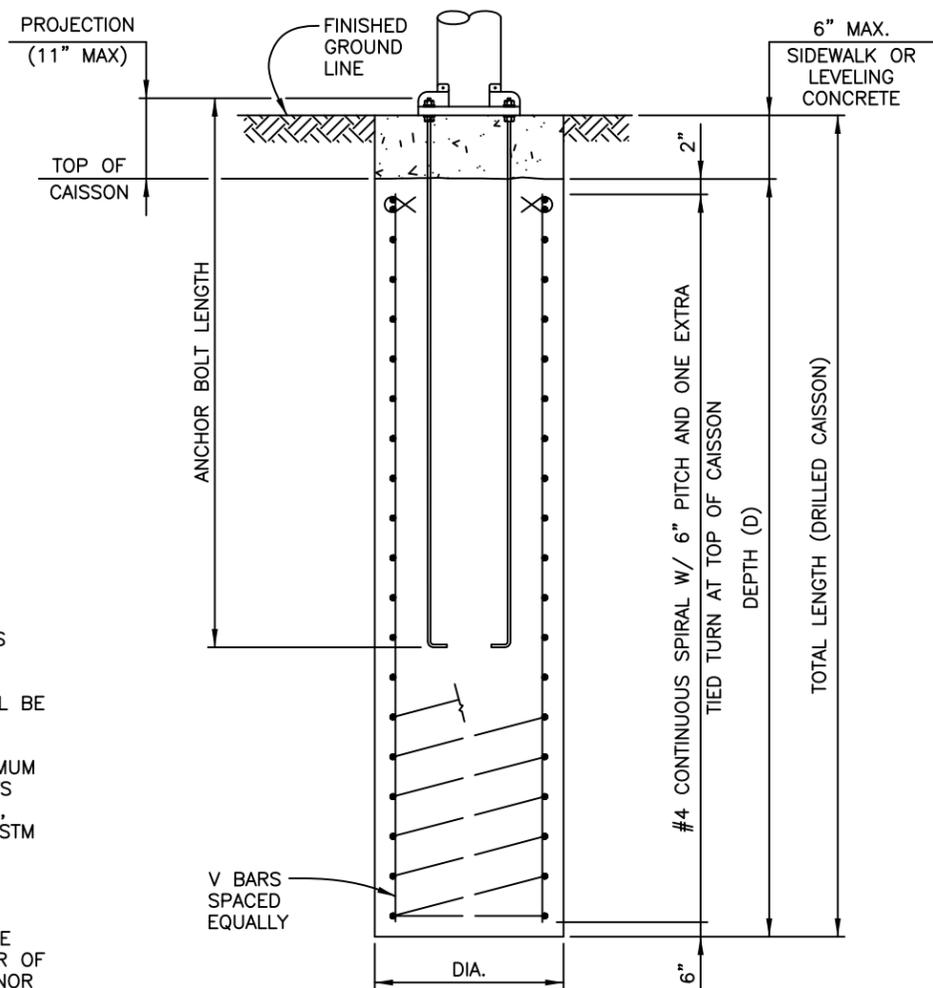
NOTES:

ANCHOR BOLTS

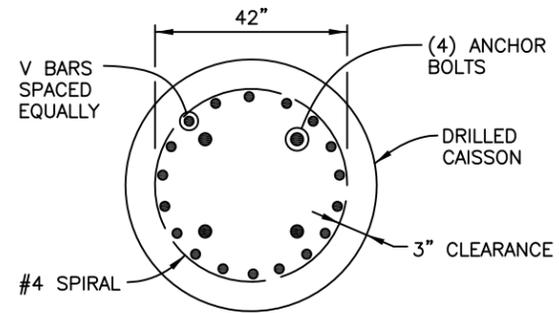
1. (4) 2" DIAMETER ANCHOR BOLTS PER CAISSON WITH (2) 2" HEX AND (2) 2" WASHERS PER BOLT WITH THREADED END GALVANIZED TO AT LEAST 12" FROM END.
2. LENGTH, THREAD LENGTH, HOOK LENGTH, AND DIAMETER OF EACH ANCHOR BOLT SHALL BE AS NOTED ABOVE IN DETAIL.
3. ANCHOR BOLTS SHALL BE MEDIUM STRENGTH, MILD STEEL OR ALLOY STEEL WITH MINIMUM DESIGN YIELD STRENGTH OF ASTM F1554 GRADE 55, OR 55 KSI. ALLOY ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A193 GRADE B7. MEDIUM STRENGTH, MILD STEEL ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF A MODIFIED ASTM A36 (WITH 55 KSI YIELD STRENGTH), OR ASTM A572 GRADE 55.
4. WELDED SPlicing OF A ROD MATERIAL FOR ANCHOR BOLTS WILL NOT BE PERMITTED.
5. THREADS FOR ANCHOR BOLTS SHALL BE ROLLED OR CUT THREADS OF UNIFIED COARSE THREAD SERIES IN ACCORDANCE WITH ANSI B1.1. FOR ROLLED THREADS, THE DIAMETER OF THE UNTHREADED PORTION SHALL NOT BE LESS THAN THE MINIMUM PITCH DIAMETER NOR MORE THAN THE MAXIMUM MAJOR DIAMETER OF THE THREADS.
6. ALL THREADS FOR BOLTS AND NUTS SHALL HAVE CLASS 2 FIT TOLERANCES IN ACCORDANCE WITH ANSI B1.1.

NUTS AND WASHERS

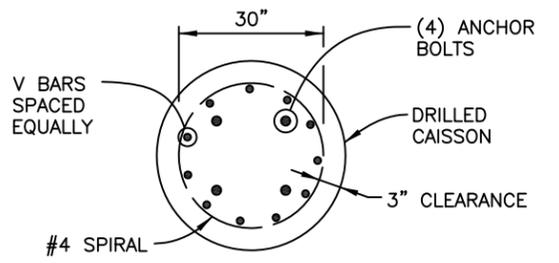
7. NUTS FOR ALLOY STEEL ANCHOR BOLTS SHALL CONFORM TO ASTM A194 GRADE 2H OR ASTM A563, HEAVY HEX, GRADE DH CLASS 12. NUTS FOR MEDIUM STRENGTH, MILD STEEL ANCHOR BOLTS SHALL CONFORM TO ASTM A194 GRADE 2H OR ASTM A563, GRADE D OR BETTER. ALL THREADS FOR NUTS SHALL HAVE A CLASS 2B TOLERANCE IN ACCORDANCE WITH ANSI B1.1. WHEN NUTS ARE TO BE GALVANIZED, THE UNTAPPED BLANKS SHALL BE GALVANIZED PRIOR TO CUTTING THE THREADS.
8. EXPOSED NUTS SHALL BE GALVANIZED OR COATED WITH A ZINC-RICH COATING IF THE ANCHOR BOLTS ARE NOT GALVANIZED.
9. WASHERS INSTALLED WITH ANCHOR BOLTS OF ANY TYPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F436 AND SHALL HAVE THE SAME FINISH OR COATING AS THE BOLT AND NUT.



CAISSON PROFILE



TRAFFIC SIGNAL POLE CAISSON - 48" DIA.



TRAFFIC SIGNAL POLE CAISSON - 36" DIA.

GENERAL NOTES

1. DESIGN OF FOUNDATIONS IS BASED ON TRAFFIC SIGNAL POLE CONFIGURATIONS PROVIDED BY VALMONT INDUSTRIES, INC. DRAWING NO. DB00714 REV. C FOR THE CITY & COUNTY OF DENVER AND XCEL ENERGY OF COLORADO. REFER TO CITY & COUNTY OF DENVER TRAFFIC STANDARD DRAWINGS FOR ANY ADDITIONAL TRAFFIC POLE INFORMATION.
2. DESIGN CRITERIA: AASHTO - STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 2001 EDITION.
3. A DESIGN WIND VELOCITY OF 100 MPH HAS BEEN USED FOR THE DESIGNS HEREIN.
4. ALL FOUNDATIONS ON THIS SHEET ARE FOR SINGLE MAST ARM POLES, EXCEPT AS NOTED.
5. THE DESIGNS HEREIN ASSUME THAT SIGNALS ARE INSTALLED WITHIN THE ROADWAY PRISM WITH THE FOLLOWING SOIL PARAMETERS:
 SOIL DENSITY $\gamma = 110$ LB./CU.FT.
 SOIL COHESION = 750 LB./SQ.FT. FOR MEDIUM STIFF COHESIVE SOIL
 SOIL ϕ ANGLE = 30° FOR MEDIUM DENSE COHESIONLESS SOIL
 SF = 1.25 FOR TORSIONAL RESISTANCE AND 3.0 FOR FLEXURAL RESISTANCE
6. CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
 (A) SIGNALS WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM
 (B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY
 (C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG
 (D) THE FOUNDATION SOILS ARE NOT HOMOGENOUS
 (E) FIRM BEDROCK IS ENCOUNTERED
 (F) CAVING SOILS
 (G) GROUNDWATER
 (H) EXPANSIVE SOILS
 (I) TRASH
 (J) BOTTOM OF CAISSON WILL EXTEND BELOW BOTTOM OF ANY ADJACENT BUILDING OR RETAINING WALL FOUNDATION
 (K) SLOPES GREATER THAN 10%
7. CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH.
8. CAISSONS SHALL BE CONSTRUCTED WITH AIR ENTRAINED CDOT CLASS BZ CONCRETE IN ACCORDANCE WITH SECTION 503 OF THE STANDARD SPECIFICATIONS. REINFORCING STEEL SHALL BE GRADE 60.
9. CAISSON CONCRETE SHALL REACH THE SEVEN DAY PREDICTED STRENGTH PRIOR TO INSTALLING THE SIGNAL STRUCTURE.
10. FOUNDATION TO BE PROVIDED WITH 3 CONDUIT STUB OUTS (2 - 3" & 1 - 2"). DIRECTION TO BE DETERMINED BY CITY & COUNTY OF DENVER ENGINEER AND IS TO BE CONSIDERED AS PART OF THE FOUNDATION BID ITEM.
11. BASE PLATE, NUTS AND NUT COVERS TO BE FURNISHED BY POLE MANUFACTURER. ANCHOR BOLTS ARE TO BE FURNISHED BY THE CONTRACTOR AND ARE INCLUDED IN THE COST OF THE FOUNDATION.
12. FOUNDATION SHALL BE PAID BY THE FEET OF DEPTH DRILLED. USE OF THE SHORTER FOUNDATION FOR COHESIONLESS SOIL SHALL BE ALLOWED ONLY BY APPROVAL OF THE CCD TRAFFIC ENGINEER.
13. PLUMBING OF POLES SHALL BE ACCOMPLISHED BY ADJUSTING NUTS AFTER LOADING OF MAST ARM.
14. EACH END OF CAISSON TIES TO BE TERMINATED WITH A 135° HOOK AROUND A LONGITUDINAL BAR.
15. DESIGN IS BASED ON A HORIZONTAL GROUND SURFACE CONDITION IN THE VICINITY OF THE CAISSON. CAISSONS SHOULD NOT BE INSTALLED AT SITES WITH A SLOPE EXCEEDING 10 PERCENT.
16. LEVELING CONCRETE SHALL BE 4,000 PSI CLASS B AIR ENTRAINED CONCRETE.
17. YIELD STRESS OF REINFORCING STEEL SHALL BE MINIMUM 60,000 PSI.

FOUNDATION SCHEDULE						
MAST ARM LENGTH (FT.)	CAISSON DATA					
	DIA. (IN.)	DEPTH (D) (FT.)		BOLT CIRCLE DIA. (IN.)	V BARS	
		COHESIVE SOIL	COHESIONLESS SOIL		SIZE	TOTAL
10 TO 40	36	13.0	12.0	20	#9	11
45	36	18.0	14.0	22	#9	11
50	36	18.0	14.0	22	#9	11
55	36	18.0	14.0	22	#9	11
60	48	17.0	14.5	25	#9	18
65	48	17.0	14.5	25	#9	18
70	48	17.0	14.5	25	#9	18
40 (DBL ARM)	36	16.0	13.5	22	#9	11

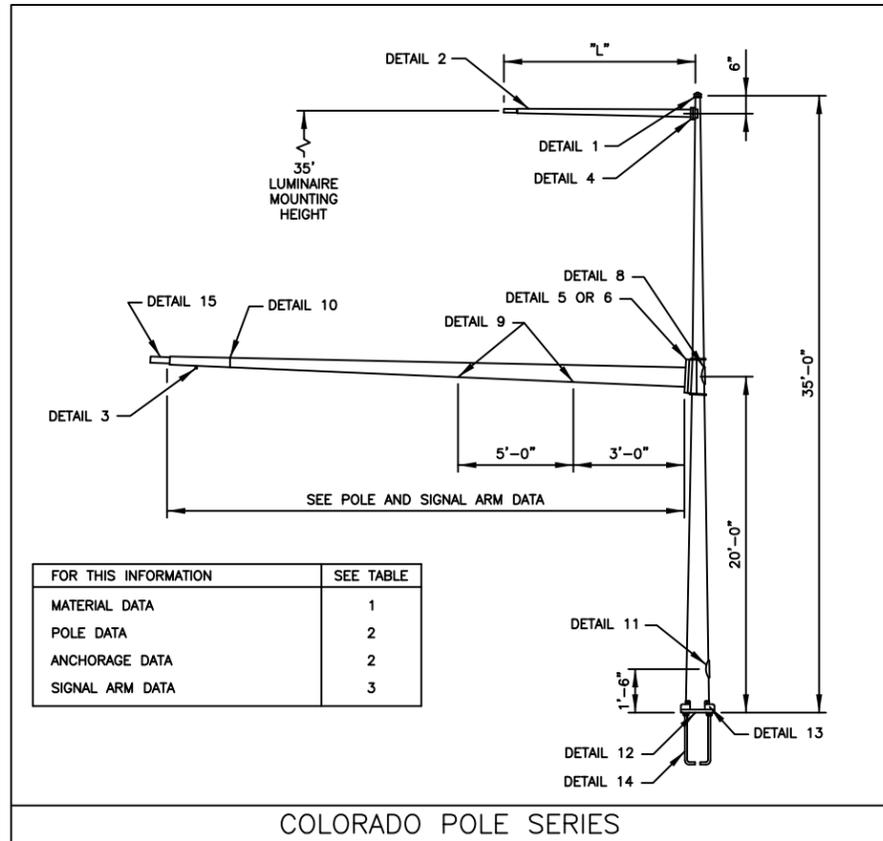
CITY & COUNTY OF DENVER

SIGNAL POLE FOUNDATION



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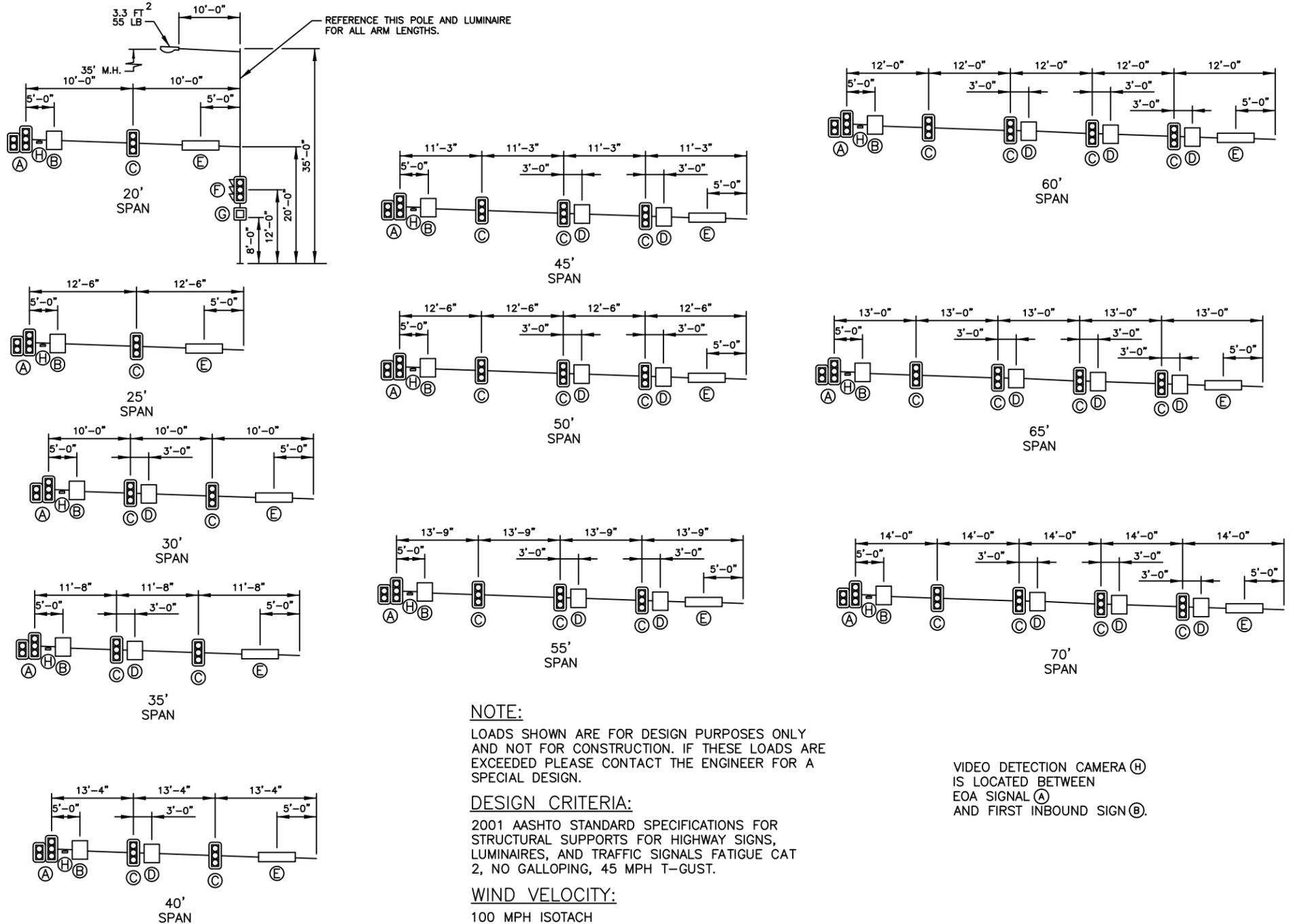
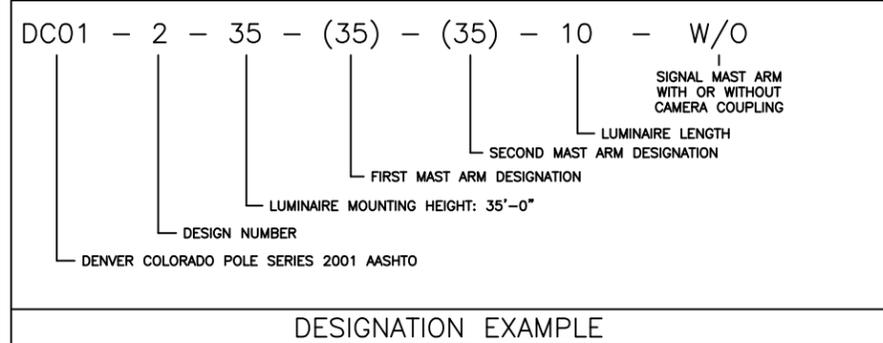


COLORADO POLE SERIES

TABLE 1: MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFTS - .188,.219 .250,.281,.313	A572 GR. 65	65	ANCHOR BOLTS	F1554	55
	A572 GR. 55	55	POLE BASE	A572	50
POLE SHAFTS - 3 GA.	A595 GR. A	55	LUMINAIRE ARM ATTACHMENTS	A36	36
	A572 GR. 55	55	MAST ARM ATTACHMENTS	A572	50
POLE SHAFTS - 7, 5 GA.	A595 GR. A	55	MAST CONNECTION BOLT	A325	-
	A595 GR. A	55	LUMINAIRE CONNECTION BOLT	A325	-
			GALVANIZING HARDWARE	A153	-

FINISH NOTES:
 BASE COAT - HOT DIP GALVANIZE TO ASTM A123.
 PRIME COAT - NEW HIGH BUILD EPOXY POWDER
 FINISH COAT - TGIC OR SUPER DURABLE POLYESTER POWDER
 VALMONT SPECIFICATION - F-540AC
 COLOR - DARK OLIVE/FEDERAL GREEN #14056

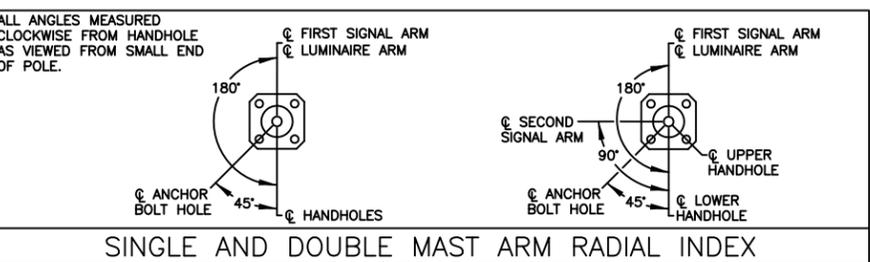


NOTE:
 LOADS SHOWN ARE FOR DESIGN PURPOSES ONLY AND NOT FOR CONSTRUCTION. IF THESE LOADS ARE EXCEEDED PLEASE CONTACT THE ENGINEER FOR A SPECIAL DESIGN.

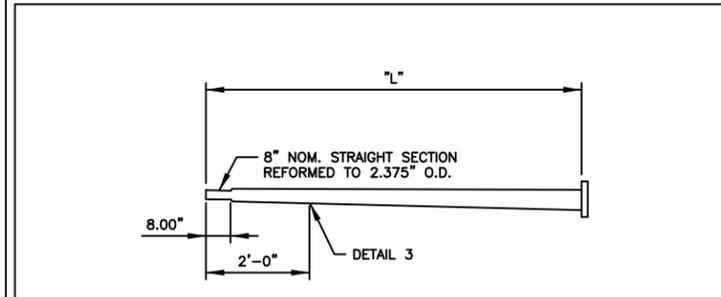
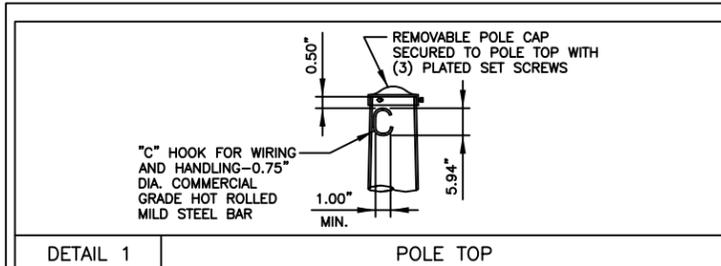
DESIGN CRITERIA:
 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS FATIGUE CAT 2, NO GALLOPING, 45 MPH T-GUST.

WIND VELOCITY:
 100 MPH ISOTACH

VIDEO DETECTION CAMERA (H) IS LOCATED BETWEEN EOA SIGNAL (A) AND FIRST INBOUND SIGN (B).

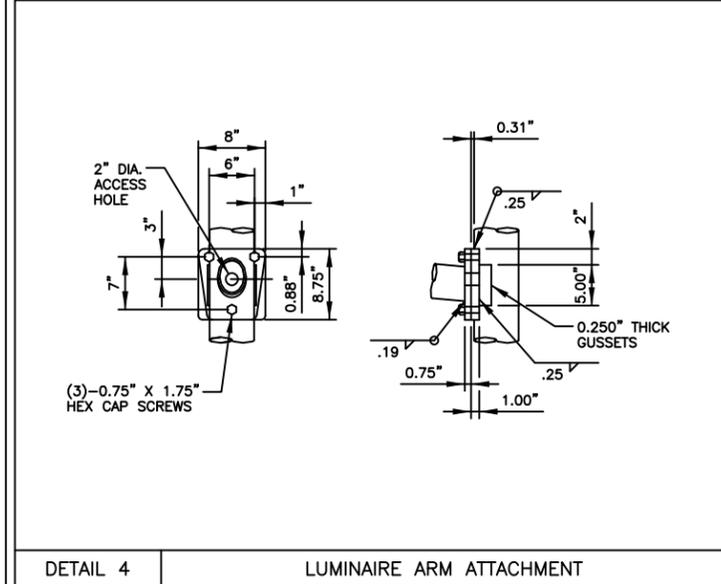
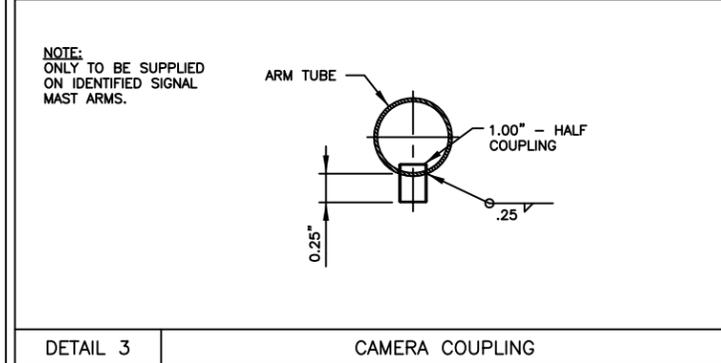


DEVICE	DESCRIPTION	PROJ. AREA (FT ²)	WEIGHT (LBS)
(A)	12" - 5 SEC. SIGNAL WITH BACKPLATE	13.72	75
(B)	36" x 60" REGULATORY SIGN	15.00	45
(C)	12" - 3 SEC. SIGNAL WITH BACKPLATE	8.67	45
(D)	30" x 36" REGULATORY SIGN	7.50	23
(E)	18" x 72" STREET NAME SIGN	9.00	27
(F)	DUAL 12" - 3 SEC. SIGNAL WITH BACKPLATE	6.50	90
(G)	SINGLE 16" PED. SIGNAL	2.25	30
(H)	CAMERA	1.00	20

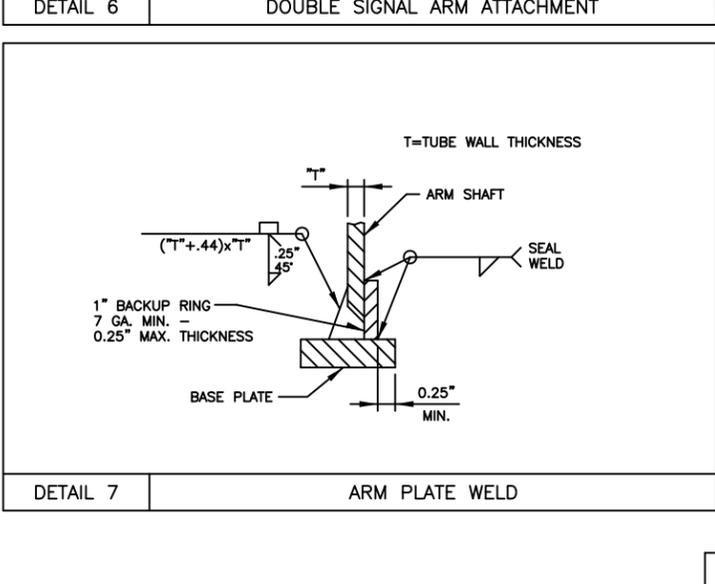
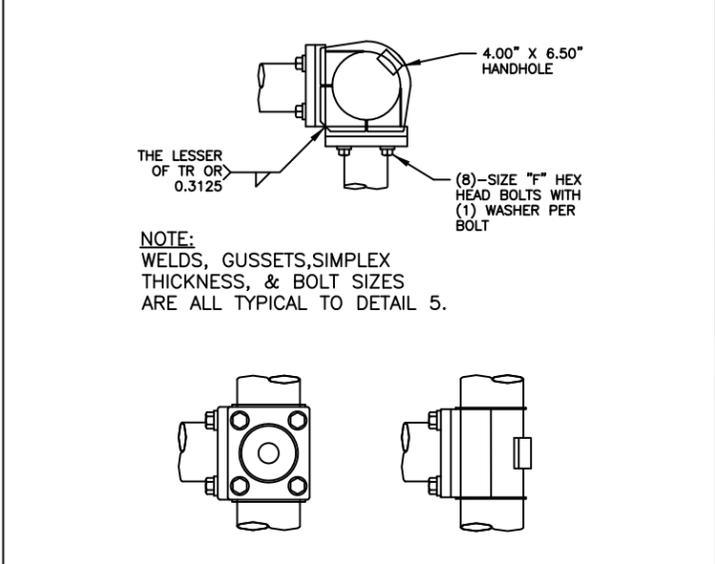
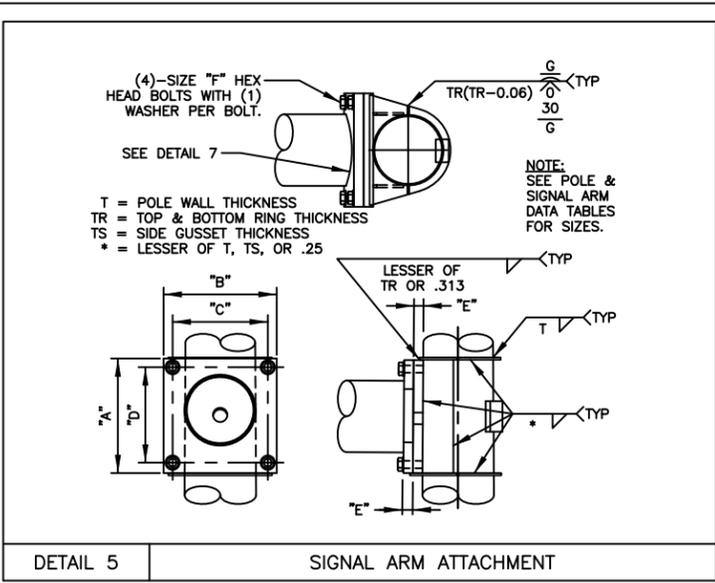


ARM RISE AFTER LOADING IS BETWEEN -0° DEG. +2° DEG FROM THE HORIZONTAL.

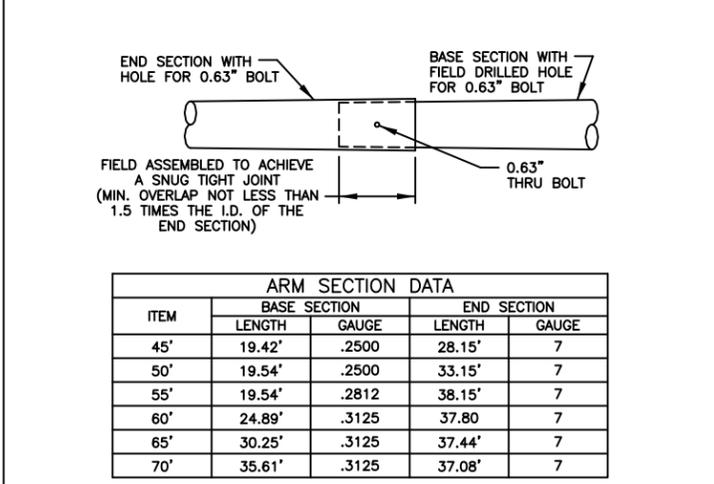
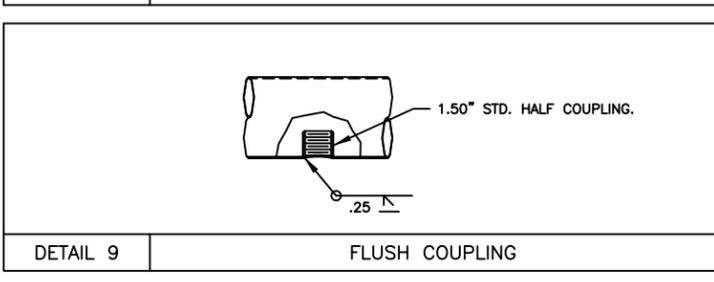
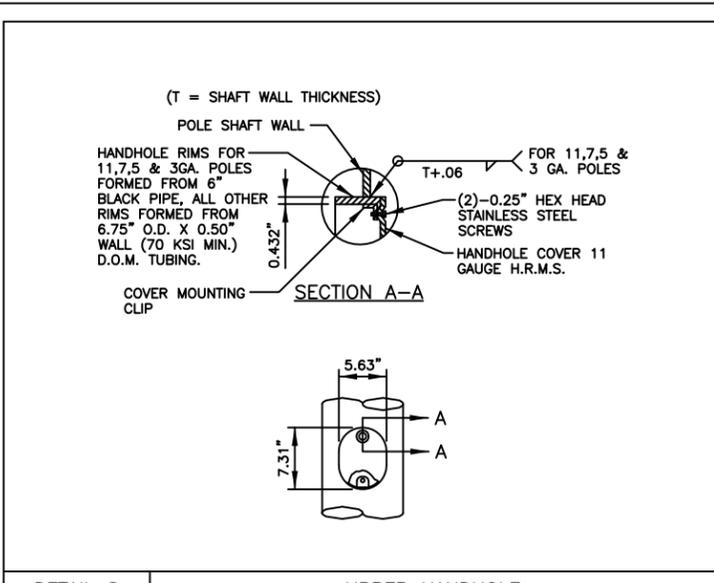
ARM SPAN L (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GA.
10	3.80	2.38	11



DETAIL 4 LUMINAIRE ARM ATTACHMENT



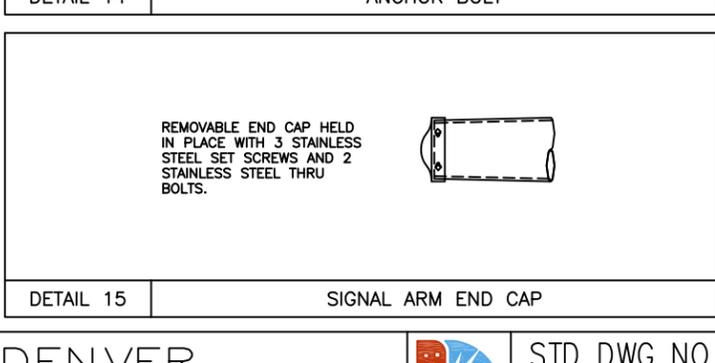
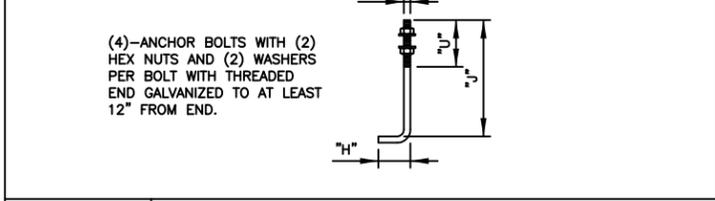
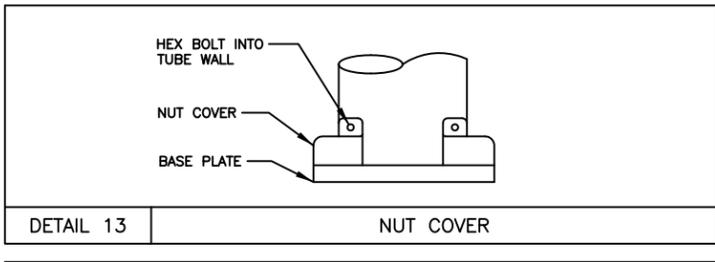
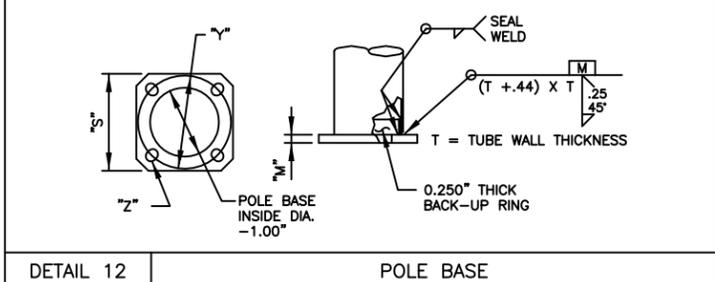
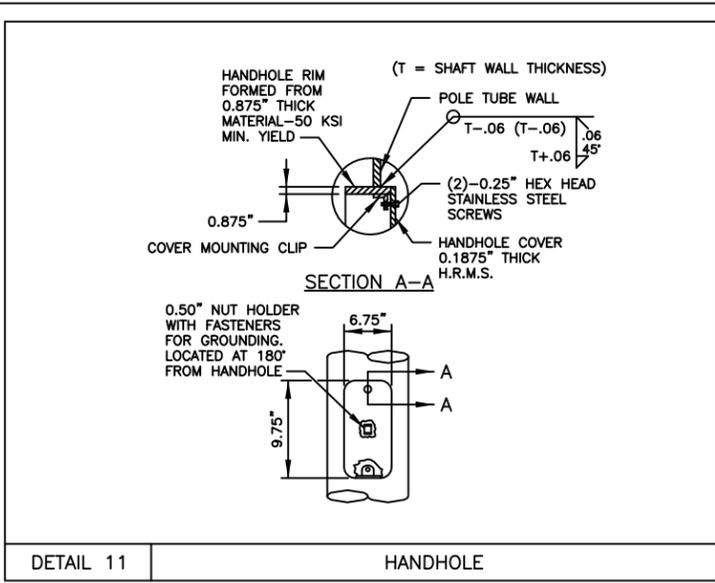
DETAIL 7 ARM PLATE WELD



ARM SECTION DATA

ITEM	BASE SECTION		END SECTION	
	LENGTH	GAUGE	LENGTH	GAUGE
45'	19.42'	.2500	28.15'	7
50'	19.54'	.2500	33.15'	7
55'	19.54'	.2812	38.15'	7
60'	24.89'	.3125	37.80'	7
65'	30.25'	.3125	37.44'	7
70'	35.61'	.3125	37.08'	7

DETAIL 10 SIGNAL ARM SLIP JOINT



DETAIL 15 SIGNAL ARM END CAP

TABLE 2: POLE DATA

POLE SERIES	DESIGN NUMBER	SINGLE ARM SPAN (FT)	DOUBLE MAST ARMS		POLE TUBE				POLE BASE				ANCHOR BOLT			
			1st ARM SPAN (FT)	2nd ARM SPAN (FT)	BASE O.D. (IN)	TOP O.D. (IN)	LENGTH (FT)	THICK (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE OR SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)
DC01	1	20,25,30,35, & 40	N.A.	N.A.	15.50	10.60	35.00	.1875	21.00	20.00	2.00	2.25	2.00	84.00	6.00	10.00
DC01	2	45,50 & 55	N.A.	N.A.	17.00	12.10	35.00	.2188	23.00	22.00	2.00	2.25	2.00	84.00	6.00	10.00
DC01	3	60,65, & 70	N.A.	N.A.	19.50	14.60	35.00	.2500	26.00	25.00	2.00	2.25	2.00	84.00	6.00	10.00
DC01	4	N.A.	20 THRU 40	20 THRU 40	15.50	10.60	35.00	.2500	23.00	22.00	2.00	2.25	2.00	84.00	6.00	10.00

MAXIMUM ARM LENGTH COMBINATION FOR DUAL CONFIGURATION ARE 40'-0" / 40'-0". ARM LENGTHS EXCEEDING THESE WILL REQUIRE A SPECIAL POLE DESIGN.

TABLE 3: SIGNAL ARM DATA

SIGNAL ARM TUBE				SIGNAL ARM SIMPLEX					
MAXIMUM ARM SPAN (FT)	FIXED END DIA. (IN)	SMALL END DIA. (IN)	GAUGE	A X B (IN)	C X D (IN)	THICKNESS "E" (IN)	BOLT SIZE "F" (IN)	GUSSET THICKNESS (IN)	ANGLE OF RISE IN ARM
20.00	9.00	6.20	7	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	0.00°
25.00	10.00	6.50	7	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	0.50°
30.00	12.00	7.80	5	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	0.50°
35.00	12.50	7.60	5	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	1.00°
40.00	13.00	6.90	3	21.75 X 21.75	18.00 X 18.00	1.75	1.50 X 3.75	.375	1.50°
45.00	14.00	8.06	SEE DETAIL 10 SHEET 16.10	23.25 X 23.25	19.50 X 19.50	2.00	1.50 X 4.25	.500	1.50°
50.00	15.00	8.36	SEE DETAIL 10 SHEET 16.10	23.25 X 23.25	19.50 X 19.50	2.00	1.50 X 4.25	.500	1.50°
55.00	15.00	7.66	SEE DETAIL 10 SHEET 16.10	23.25 X 23.25	19.50 X 19.50	2.00	1.50 X 4.25	.500	2.00°
60.00	15.75	7.71	SEE DETAIL 10 SHEET 16.10	26.25 X 26.25	22.50 X 22.50	2.00	1.50 X 4.25	.500	2.00°
65.00	16.50	7.76	SEE DETAIL 10 SHEET 16.10	26.25 X 26.25	22.50 X 22.50	2.00	1.50 X 4.25	.500	2.00°
70.00	17.25	7.81	SEE DETAIL 10 SHEET 16.10	26.25 X 26.25	22.50 X 22.50	2.00	1.50 X 4.25	.500	2.50°

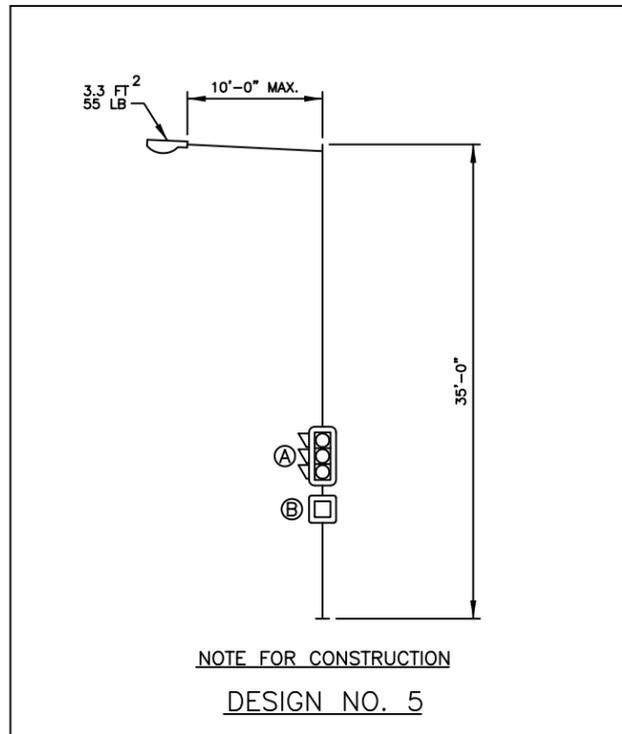
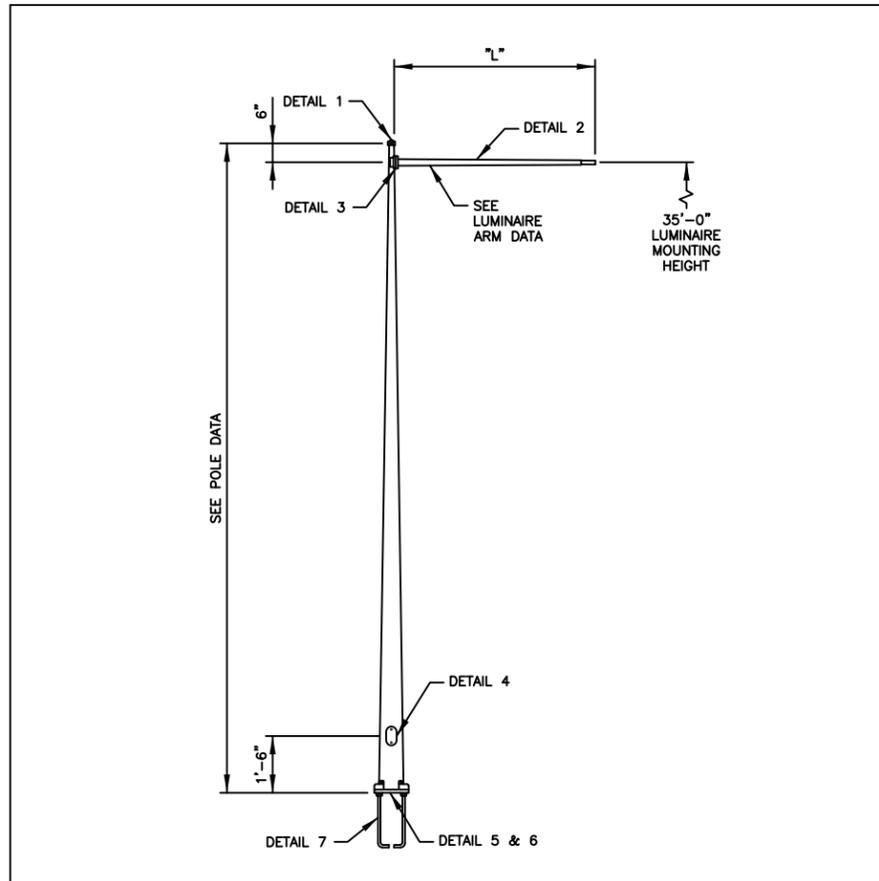
CITY & COUNTY OF DENVER

TABLE DATA

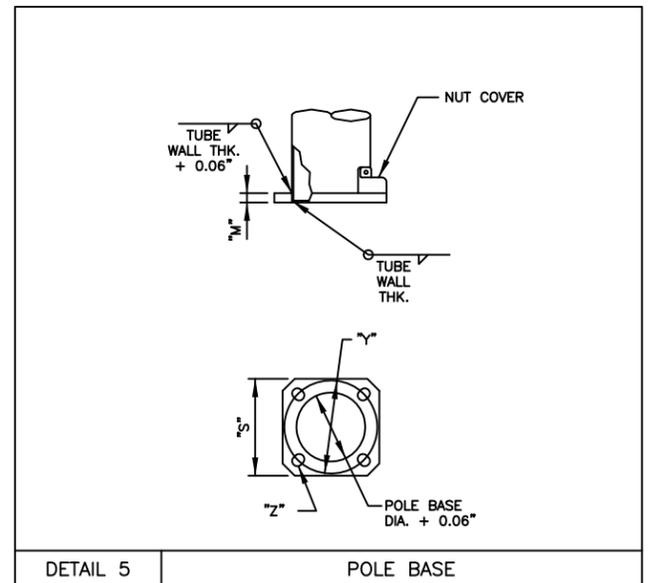
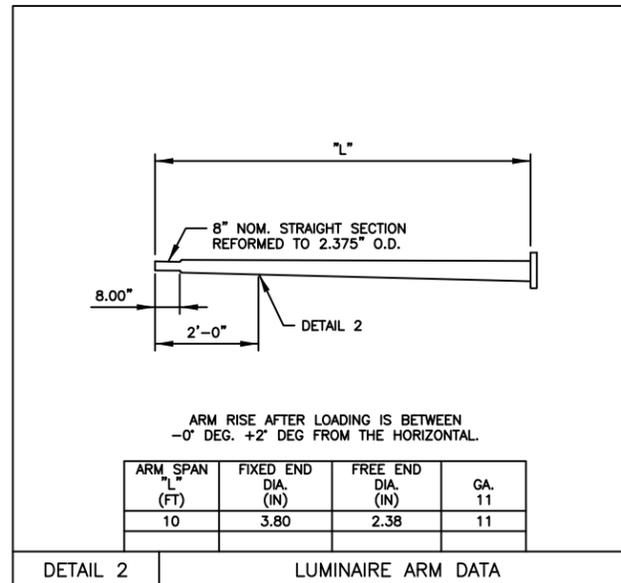


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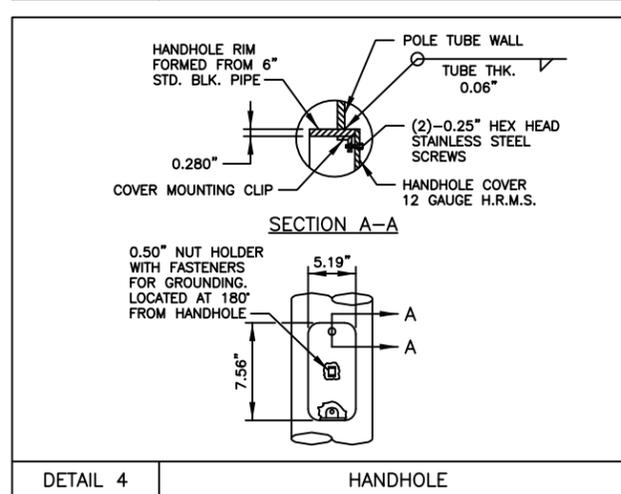
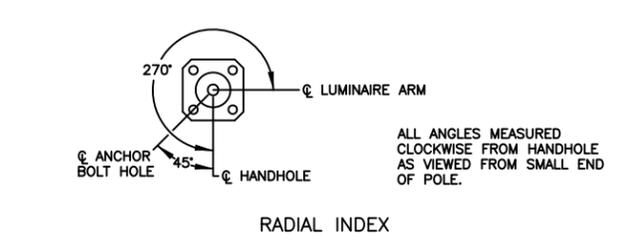
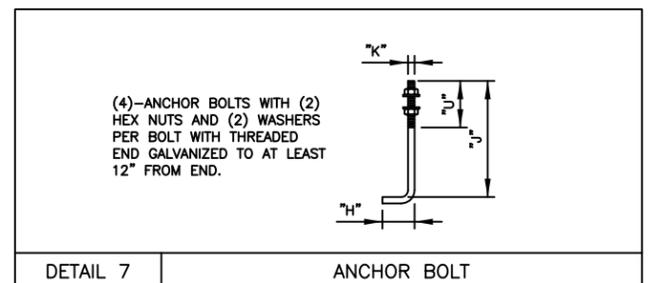
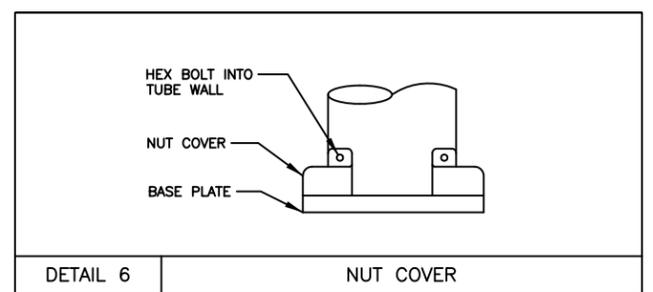
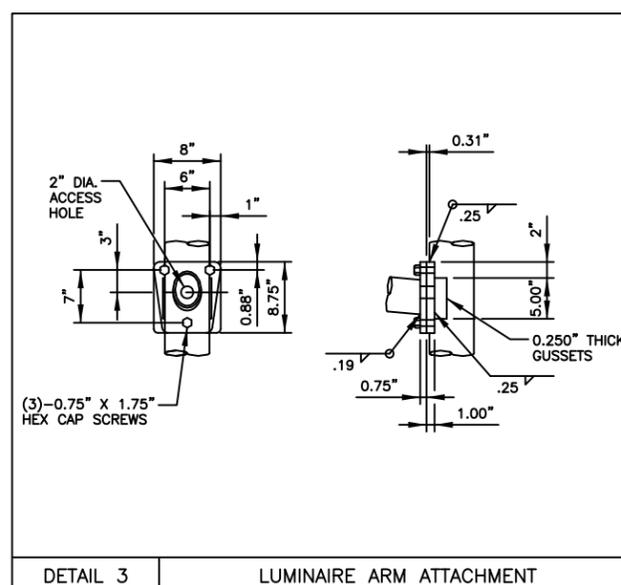
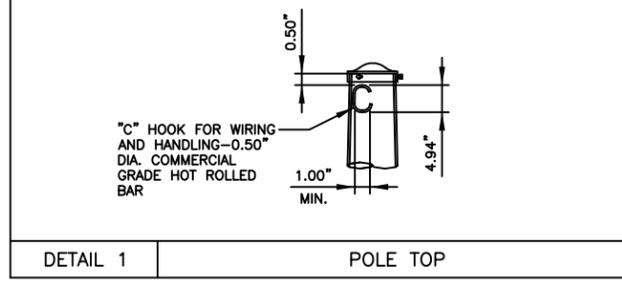


DEVICE	DESCRIPTION	PROJ. AREA (FT ²)	WEIGHT (LBS)
A	DUAL 12"-3 SEC. SIGNAL WITH BACKPLATE	17.34	90
B	SINGLE 16" PED SIGNAL	2.25	30



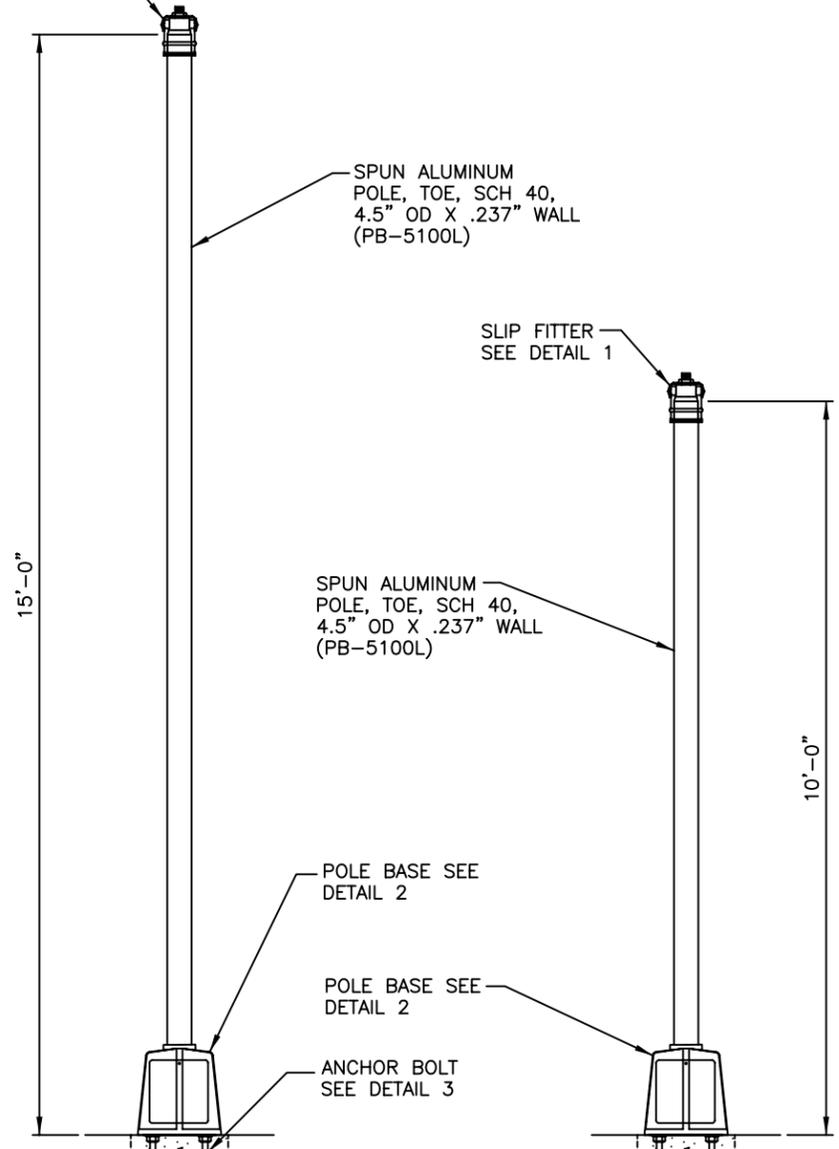
MATERIAL DATA					
COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFT	A595 GR. A	55	GALVANIZING - HARDWARE	A153	
ARM SHAFT	A595 GR. A	55	LUM. CONNECTION BOLT	A325	
POLE BASE	A36	36	LUM. ARM ATTACHMENTS	A36	36
			ANCHOR BOLTS	F1554	55

FINISH NOTES:
 BASE COAT - HOT DIP GALVANIZE TO ASTM A123.
 PRIME COAT - NEW HIGH BUILD EPOXY POWDER
 FINISH COAT - TGIC OR SUPER DURABLE POLYESTER POWDER
 VALMONT SPECIFICATION - F-540AC
 COLOR - GREEN



QTY.	POLE SERIES	DESIGN NUMBER	SINGLE ARM SPAN (FT)	POLE TUBE				POLE BASE				ANCHOR BOLT				
				BASE O.D. (IN)	TOP O.D. (IN)	LENGTH (FT)	THICK (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE OR SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD	THREAD LENGTH "U" (IN)
	DC01	5		8.75	3.85	35.00	.1793	12.00	12.50	1.25	1.38 X 1.94	1.25	42.00	6.00	7.00	6.00

SLIP FITTER
SEE DETAIL 1



10' PEDESTAL POLE FOUNDATION SEE DETAIL 4

15' PEDESTAL POLE FOUNDATION SEE DETAIL 5

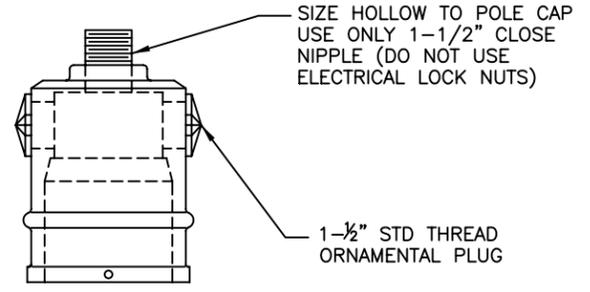
ANCHOR BOLT SEE DETAIL 3

ANCHOR BOLT SEE DETAIL 3

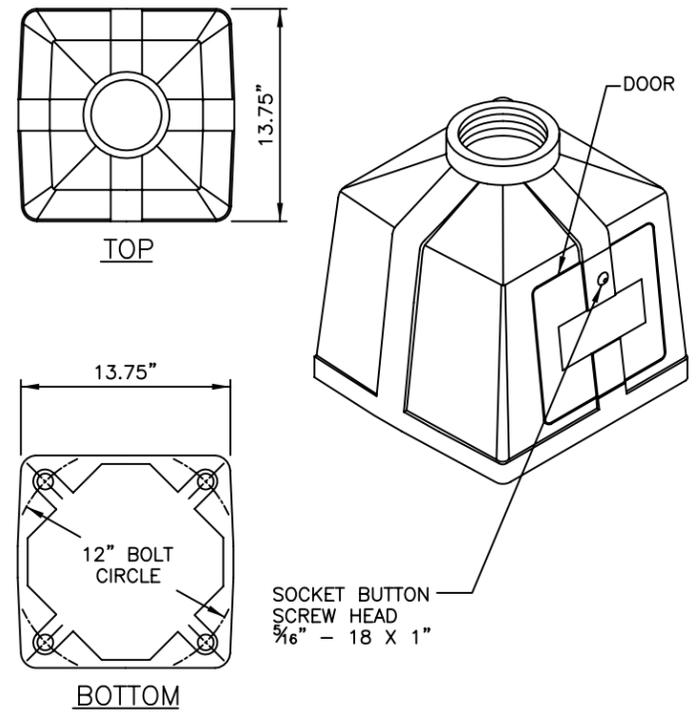
15' PEDESTAL POLE

10' PEDESTAL POLE

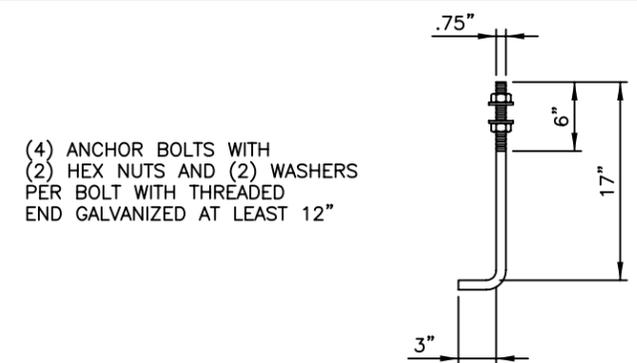
10' AND 15' PEDESTAL POLES AND BASES



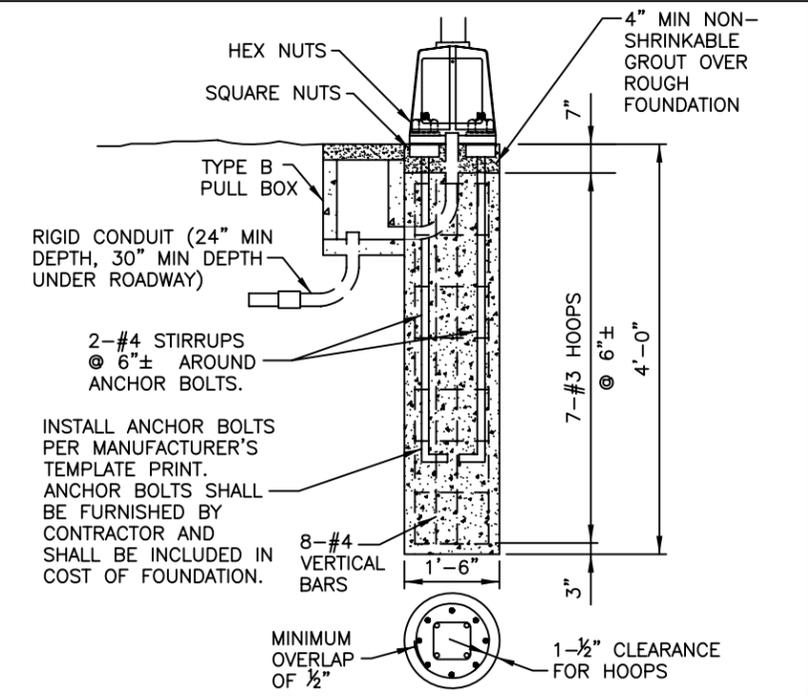
DETAIL 1 SLIP FITTER



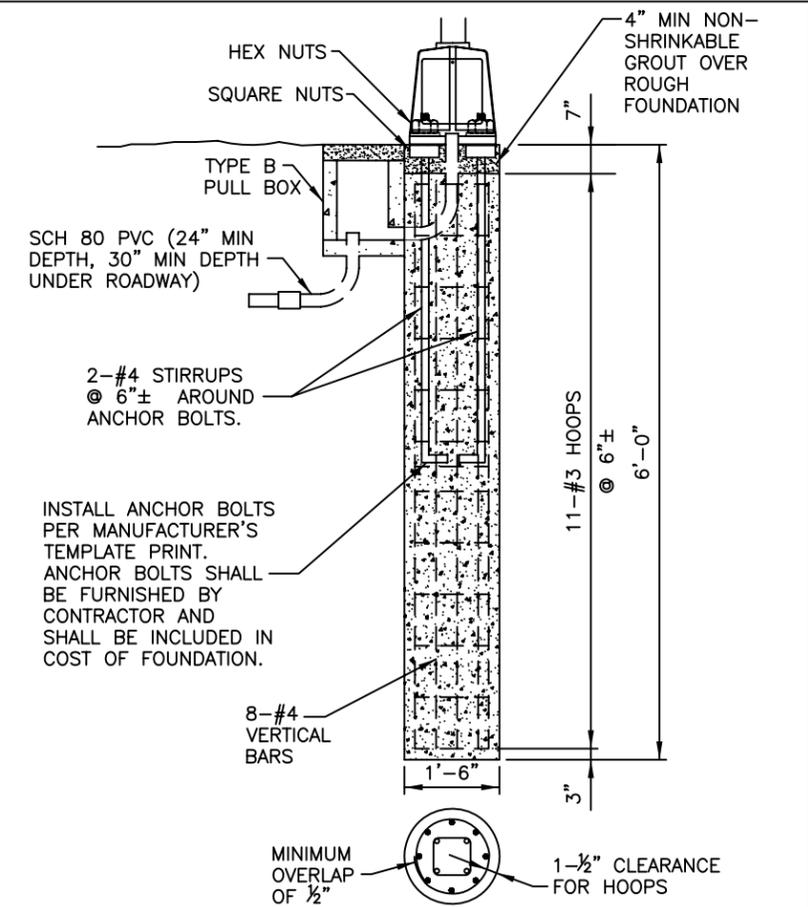
DETAIL 2 SQUARE ALUMINUM POLE BASE



DETAIL 3 ANCHOR BOLT



DETAIL 4 FOUNDATION BASE - 10' PEDESTAL POLE



DETAIL 5 FOUNDATION BASE - 15' PEDESTAL POLE

NOTE: COST OF FOUNDATION IS INCIDENTAL TO THE COST OF THE POLE.

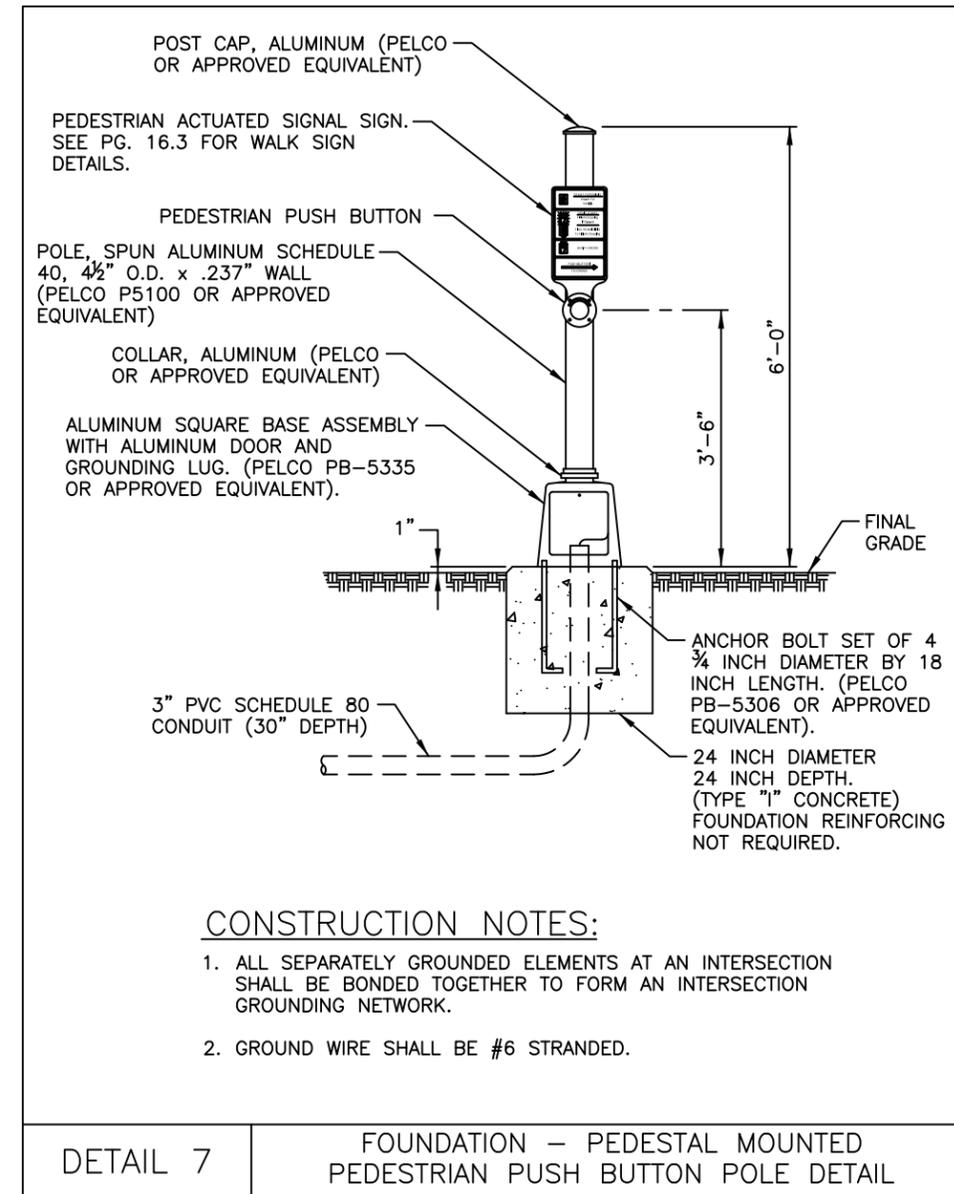
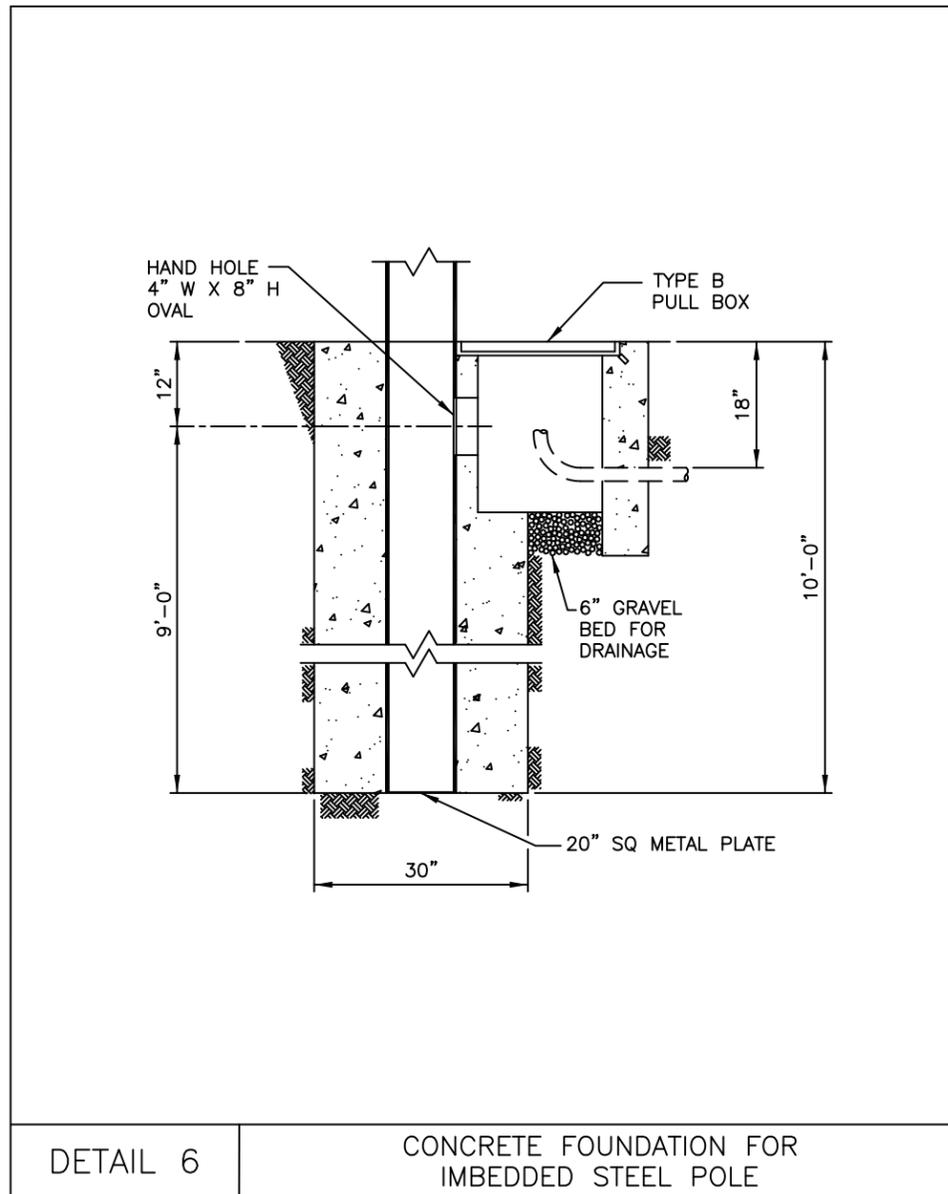
CITY & COUNTY OF DENVER

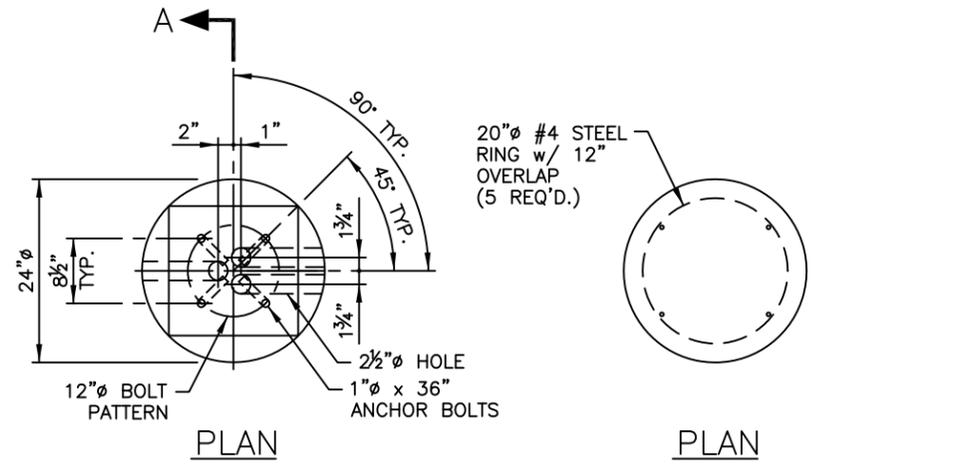
PEDESTAL POLE DETAILS



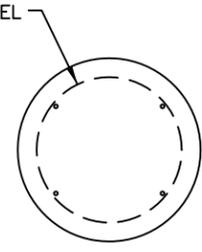
STD DWG NO
16.1.13

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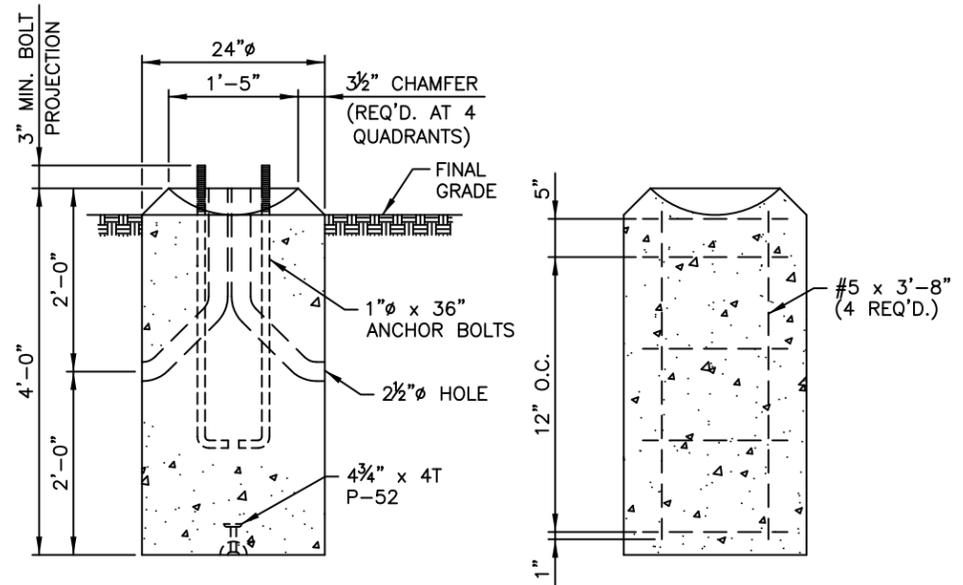




PLAN



PLAN



SECTION A-A

SECTION A-A

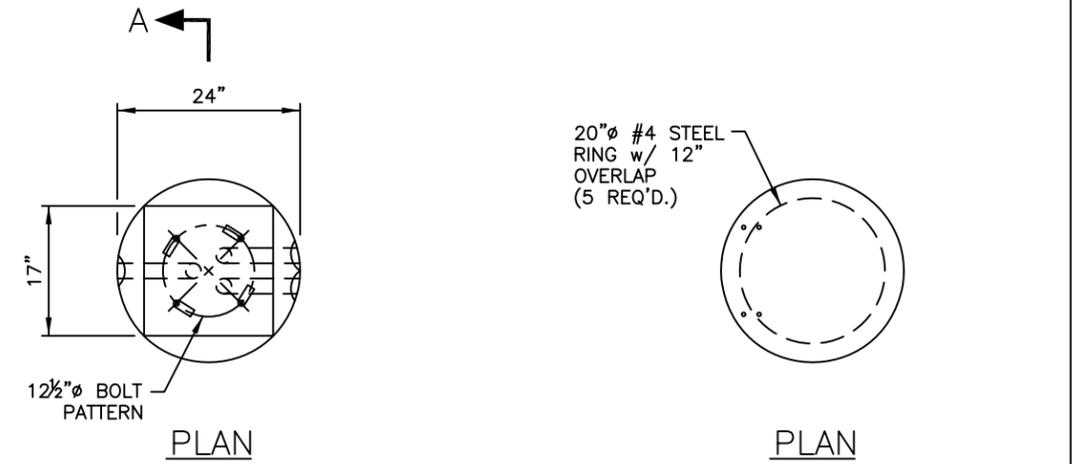
MATERIALS

1. 4 - #5 VERTICAL REINFORCING BARS 3'-8" LONG.
2. 5 - #4 HOOPS, 20" DIAMETER w/ 12" OVERLAP.
3. 4 - 1" x 36" ANCHOR BOLTS w/ 3" BEND PER XCEL SPEC. 12520000-5.
4. CONCRETE SHALL BE 6000 PSI. FINISH SHALL BE SMOOTH FINISH.
5. CONCRETE VOLUME SHOULD BE APPROX. 0.459 CY.
6. 3 - 2" POLYETHYLENE TUBING OR 2 1/2" CABLE ENTRANCES.

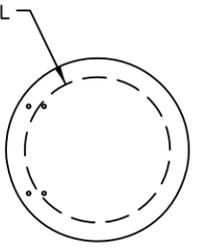
DETAIL 8

STREET LIGHT POLE BASE

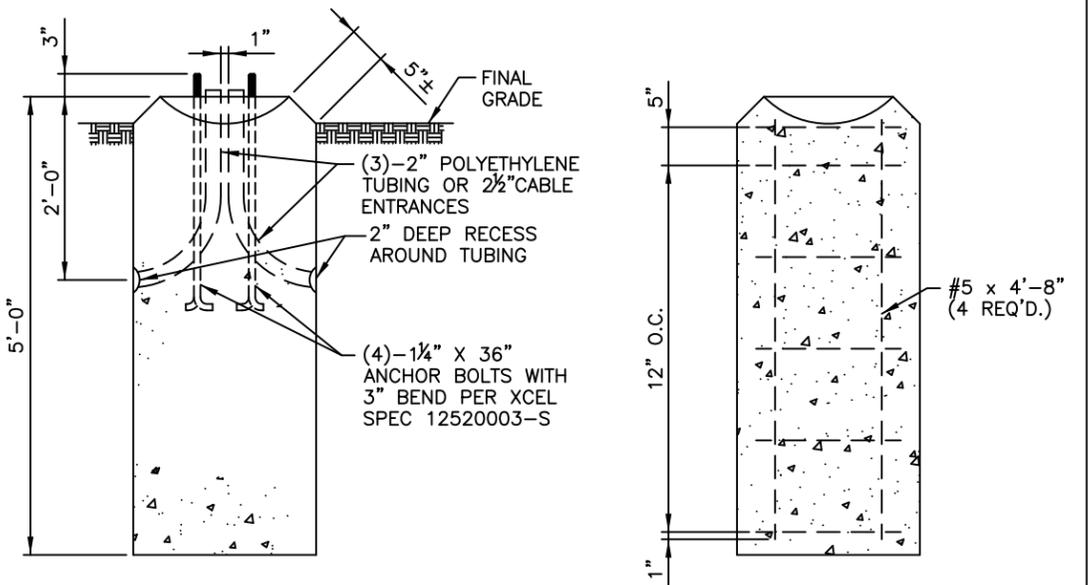
* FOR INFORMATION ONLY *



PLAN



PLAN



SECTION A-A

SECTION A-A

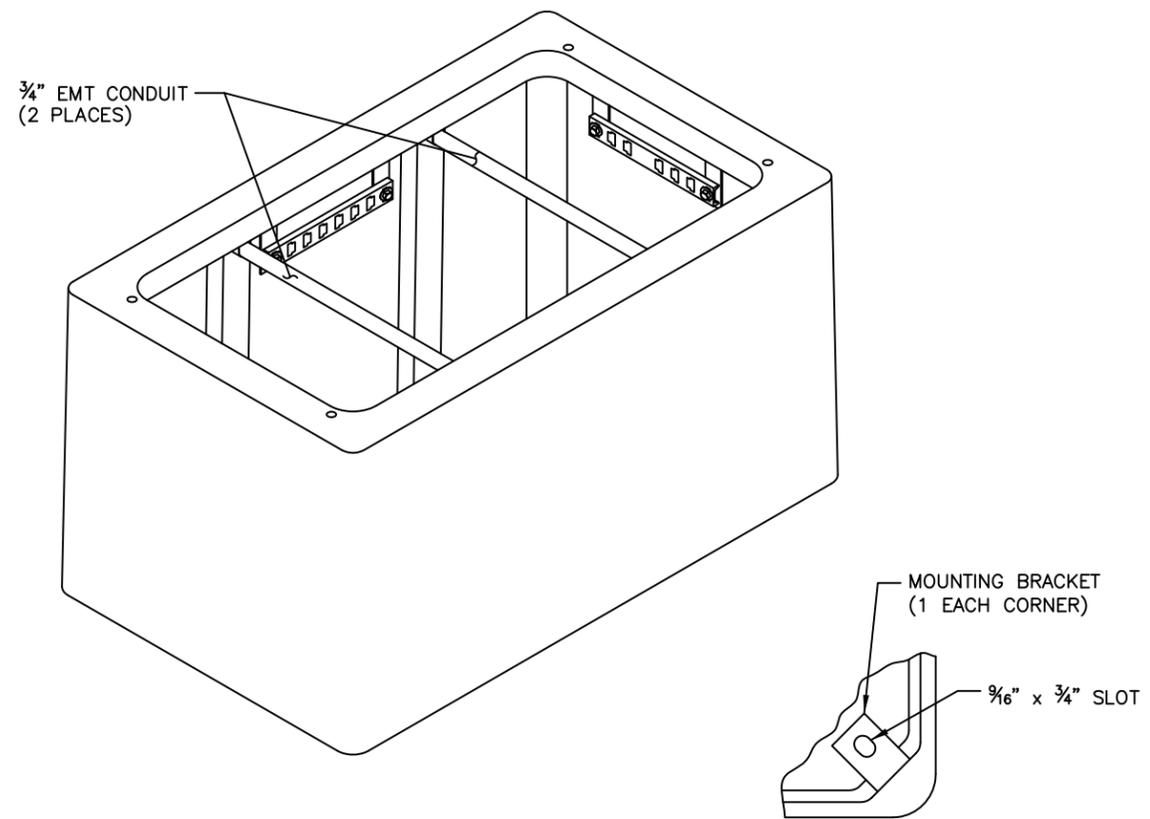
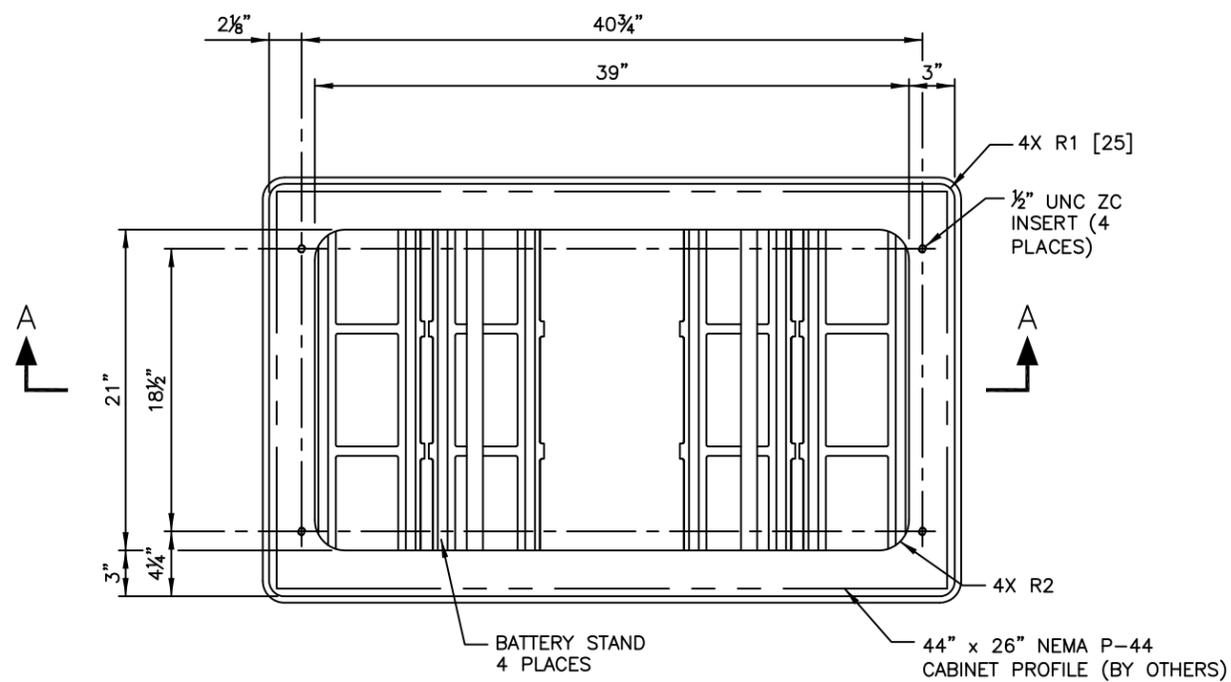
NOTES:

1. ALL FOUNDATION DETAILS SHALL BE SUBMITTED TO XCEL ENERGY AND CITY & COUNTY OF DENVER TRAFFIC ENGINEERING SERVICES. NO FOUNDATIONS SHALL BE INSTALLED UNTIL SUBMITTALS HAVE BEEN ACCEPTED BY XCEL ENERGY.
2. ALL FOUNDATIONS INSTALLED FOR XCEL FACILITIES BECOME THE PROPERTY OF XCEL ENERGY UPON ACCEPTANCE OF THE PROJECT.
3. ALL FOUNDATIONS SHALL BE PRECAST PER THE DETAILS PROVIDED.
4. FOR CITY PROJECTS WITH FEDERAL MONEY ATTACHED, THE CONTRACTOR SHALL PROVIDE AND INSTALL FOUNDATIONS PER XCEL ENERGY REQUIREMENTS.

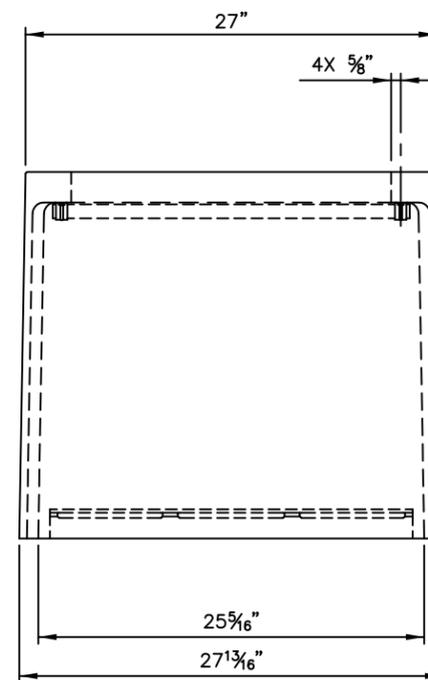
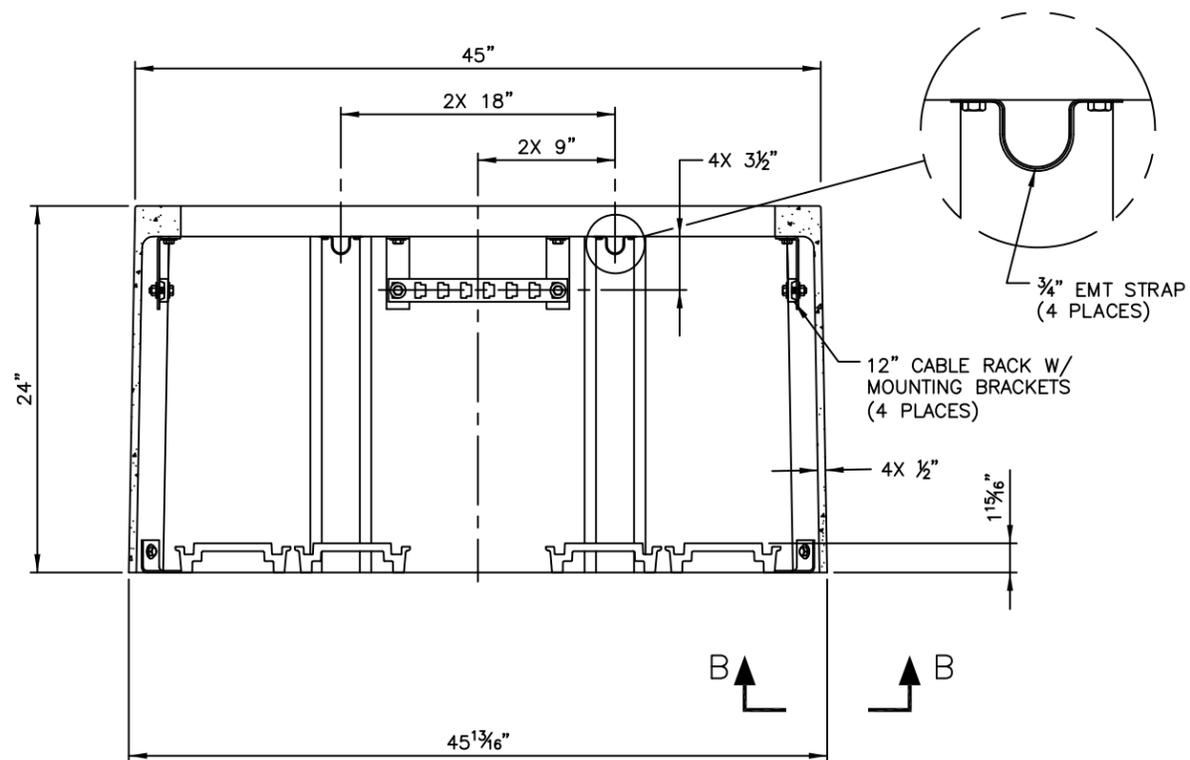
DETAIL 9

PRECAST STREET LIGHT FOUNDATION WITH POLE MOUNTED TRAFFIC SIGNAL HEADS (NO MAST ARM)





VIEW B-B
4 PLACES



NOTES:

1. BASE DETAILS ARE FOR A NEMA P-44 CABINET ONLY.
2. BASE SHALL BE CONSTRUCTED FROM LIGHTWEIGHT POLYMER CONCRETE ONLY.
3. BASE SHALL MEET OR EXCEED ASTM D-2444 IMPACT RESISTANCE TESTING.
4. BASE SHALL MEET OR EXCEED ASTM METHOD D-543, SECTION 7, PROCEDURE 1 FOR CHEMICAL RESISTANCE.
5. BASE SHALL BE "UL" LISTED.

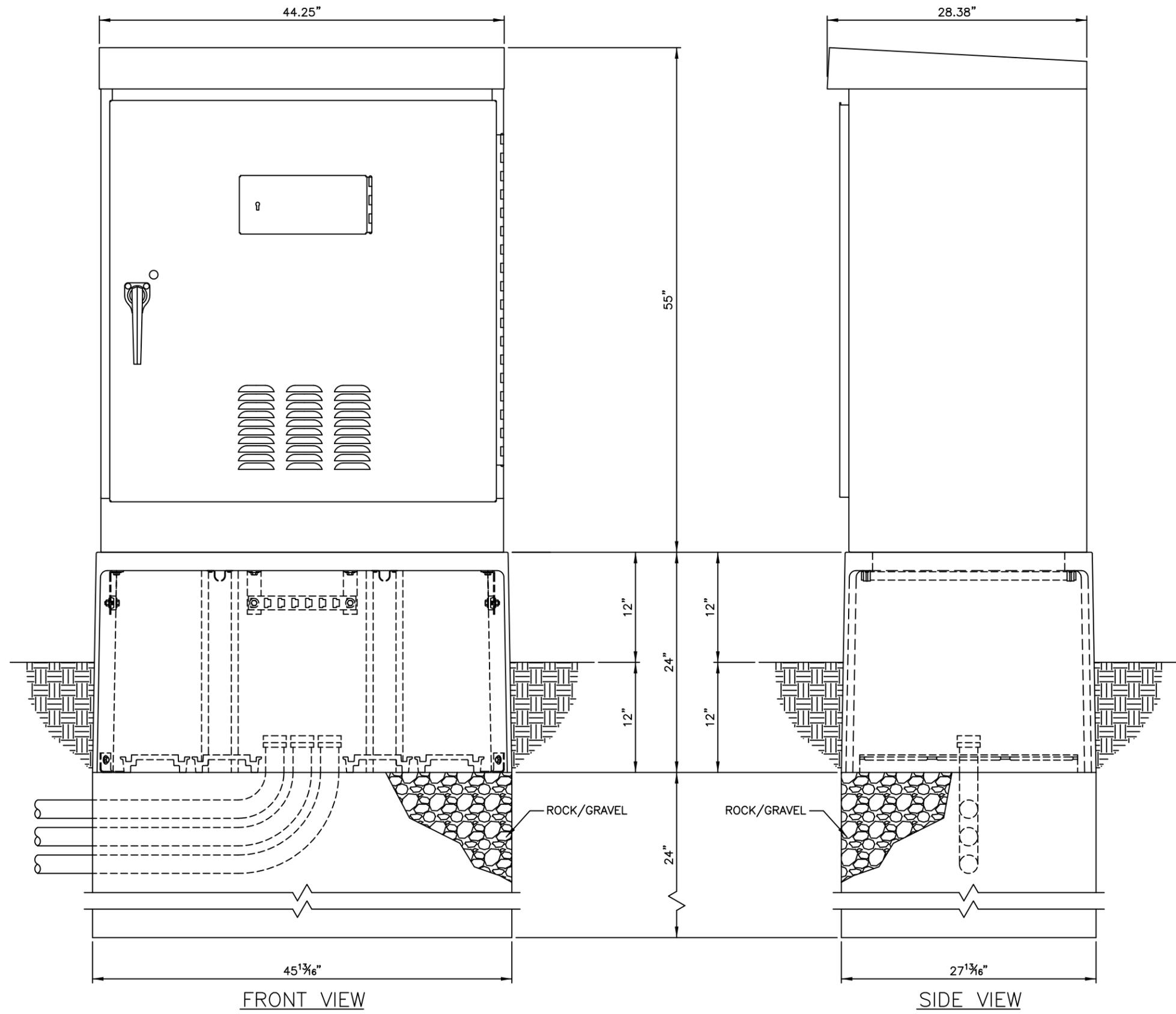
CITY & COUNTY OF DENVER

"P" CABINET BASE



STD DWG NO
16.1.16

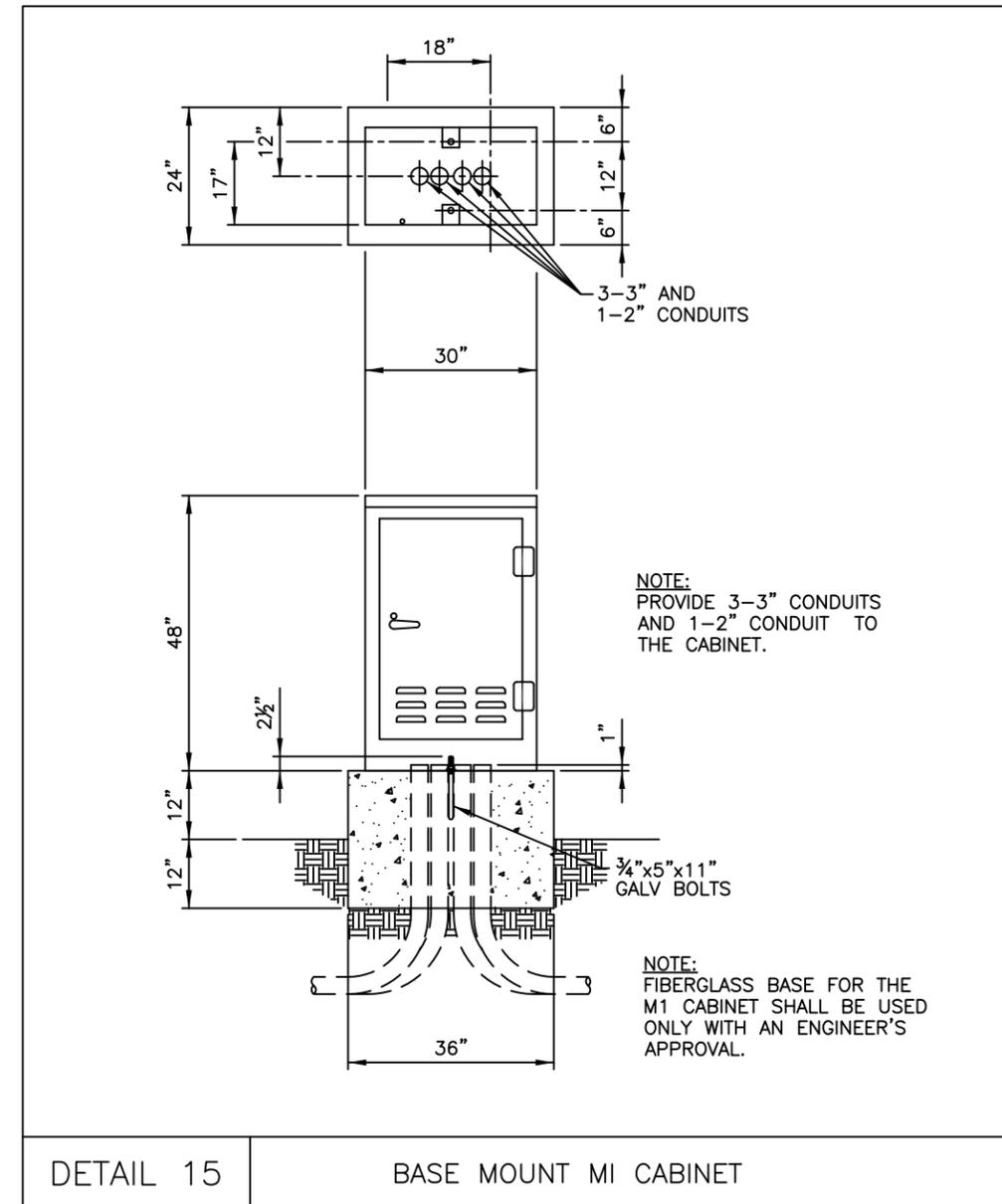
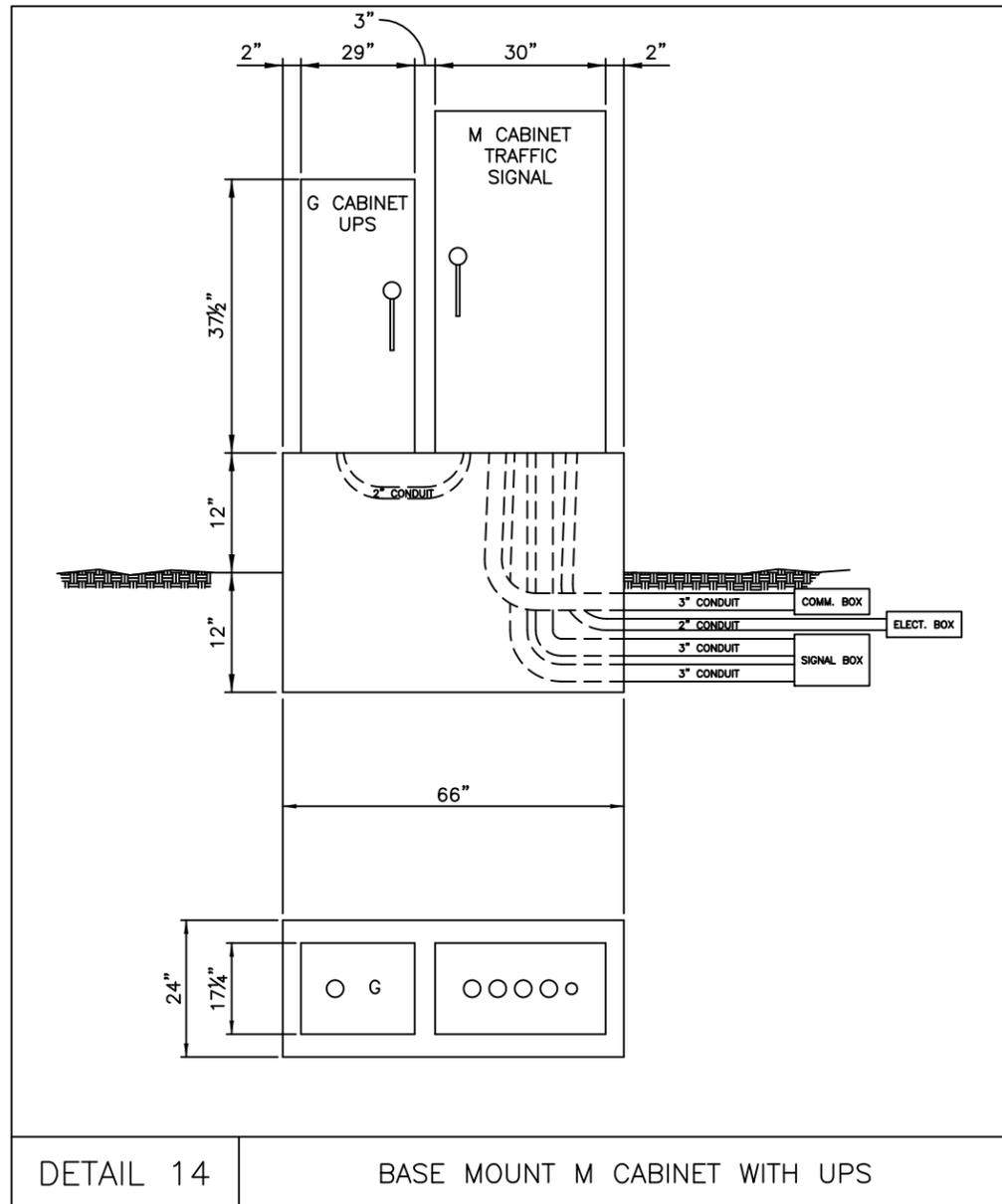
DATE
1/12/12

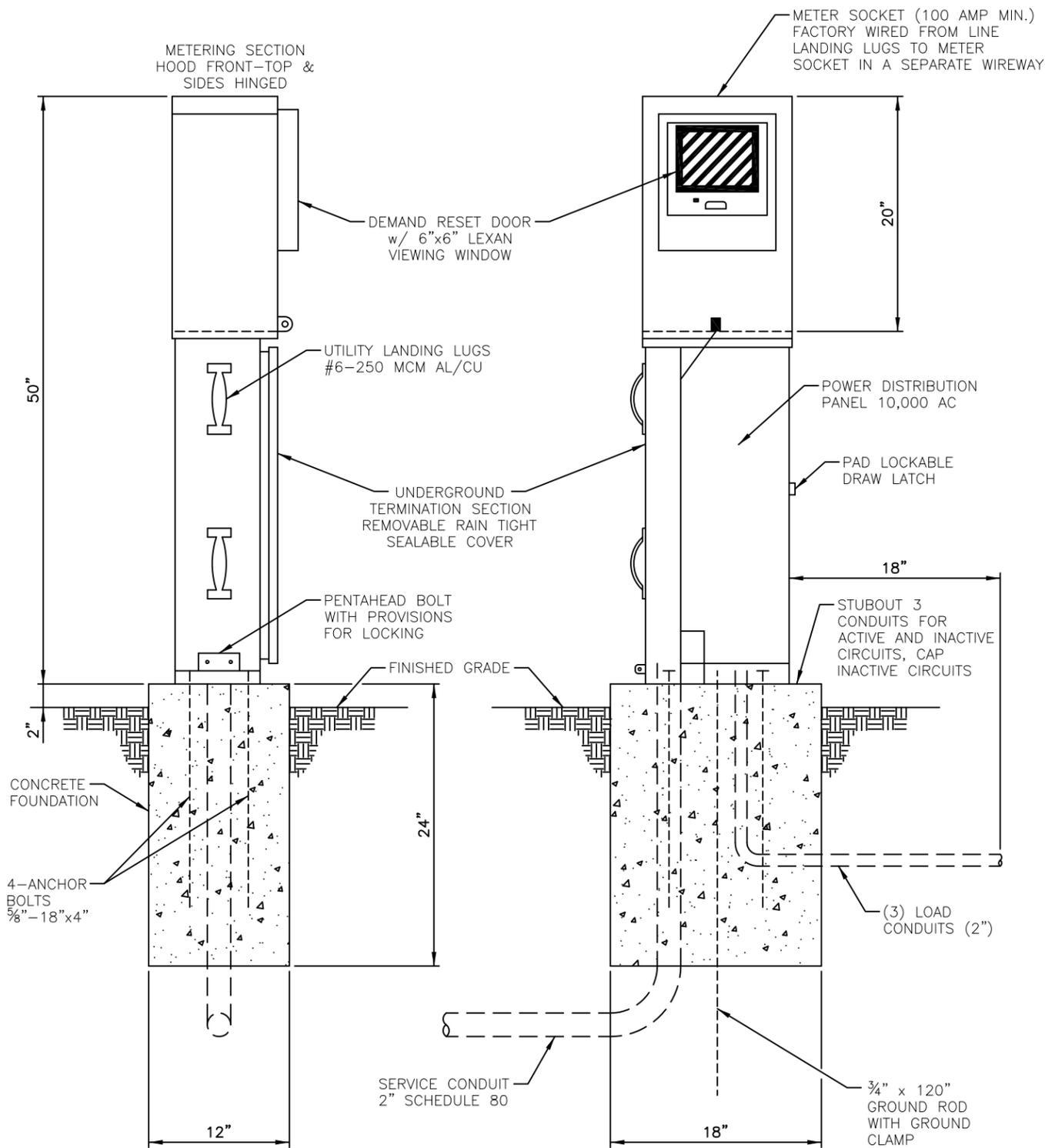


FRONT VIEW

SIDE VIEW

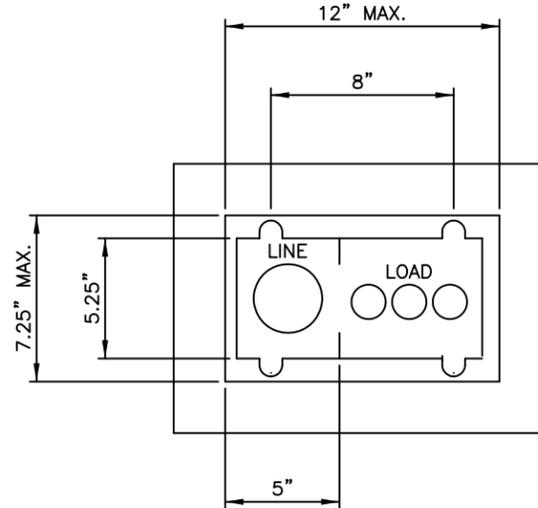
CITY & COUNTY OF DENVER		 STD DWG NO 16.1.17 DATE 1/12/12
"P" CABINET & BASE		



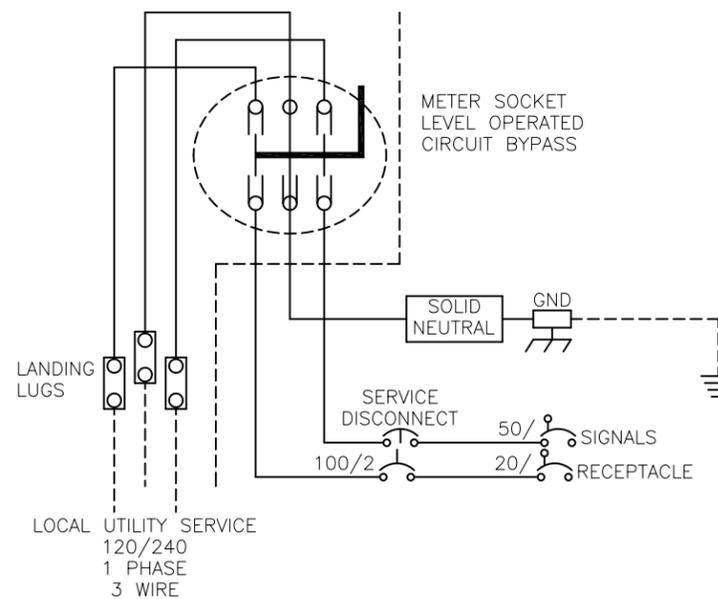


LEFT SIDE VIEW

FRONT VIEW



BASE PLAN



SERVICE EQUIPMENT WIRING DIAGRAM "A"

METER PEDESTAL CONSTRUCTION NOTES:

1. METER PEDESTAL SHALL BE UL LISTED "INDUSTRIAL CONTROL PANEL" PER UL 508.
2. METER PEDESTAL SHALL MEET THE ELECTRIC UTILITY SERVICE EQUIPMENT REQUIREMENTS COMMITTEE (EUSERC) GUIDELINES.
3. CONSTRUCTION SHALL BE NEMA 3R AND 12, RAIN TIGHT AND DUST TIGHT. ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
4. ALL NUTS, BOLTS, SCREWS AND HINGES SHALL BE STAINLESS STEEL.
5. NUTS, BOLTS AND SCREWS SHALL NOT BE VISIBLE FROM OUTSIDE OF METER PEDESTAL.
6. PHENOLIC NAME PLATES SHALL BE PROVIDED AS REQUIRED.
7. CIRCUIT BREAKERS SHALL BE CABLE IN-CABLE OUT WITH LINE ON TOP & LOAD ON THE BOTTOM. HANDLE POSITION UP="ON", MIDDLE="TRIPPED", DOWN="OFF".
8. A PLASTIC COVERED WIRING DIAGRAM SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
9. METER PEDESTAL SHALL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA STANDARDS.
10. 0.125" ALUMINUM SHEET
11. CONCRETE FOUNDATIONS INCLUDING EXCAVATION, BACKFILL, CONDUIT AND ANCHOR BOLTS, COMPLETE-IN PLACE, WILL BE CONSIDERED INCIDENTAL TO THE METER PEDESTAL.

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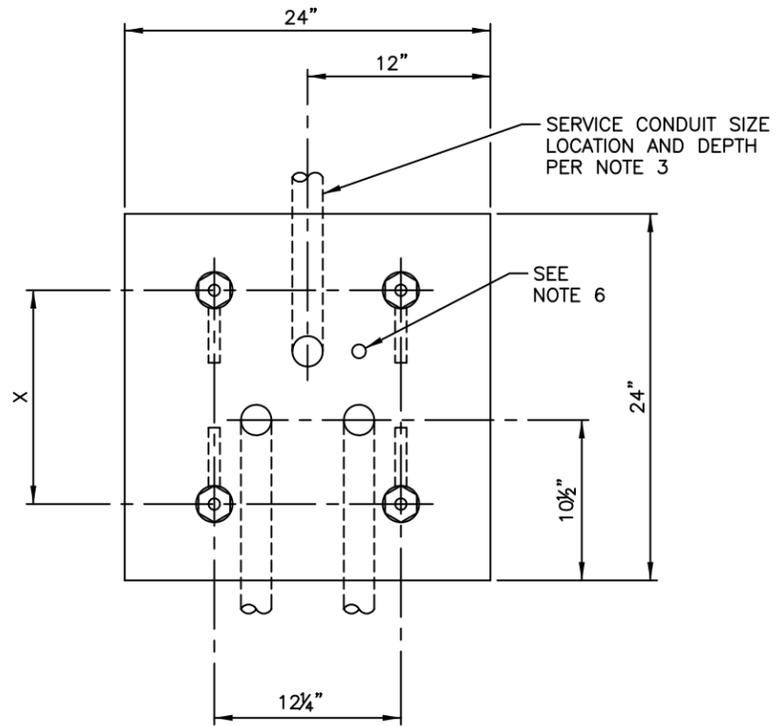
METER PEDESTAL CABINET DETAILS



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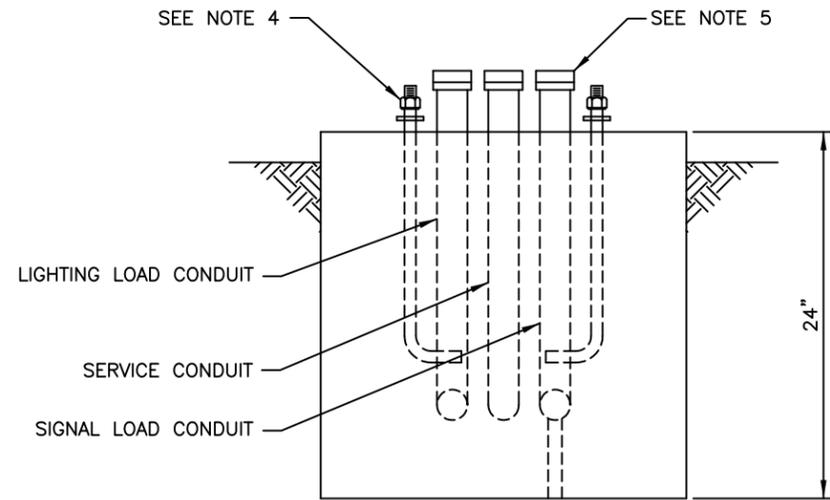
MAKE	X
TESCO	14"
MILBANK	14½"
MYERS	14¾"
PUP	14¾"



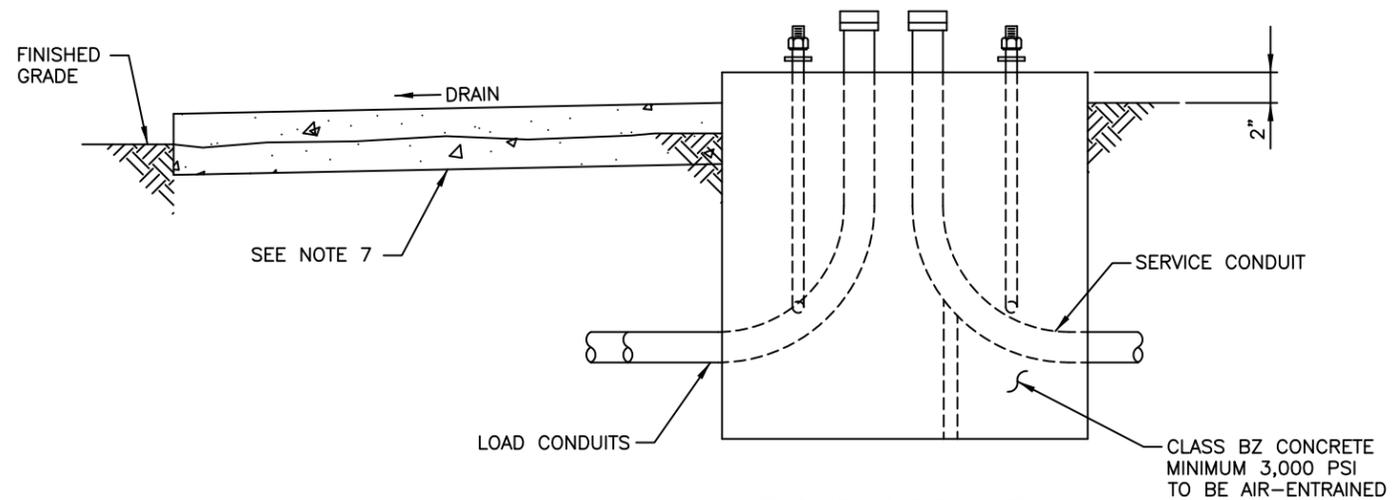
FOUNDATION PLAN

NOTES:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE SPECIFICATIONS.
2. UNSTABLE SOIL OR STEEP SLOPE MAY REQUIRE DEEPER FOUNDATIONS. SEE SPECIFICATIONS. CABINETS SHALL NOT BE LOCATED IN DRAINAGE AREAS, UNLESS THEY ARE ELEVATED.
3. CONDUIT SIZE SHALL BE 2" SCHEDULE 80 PVC.
4. ANCHOR BOLTS SHALL BE GALVANIZED, 5/8" x 18" x 4" COMPLETE WITH NUTS AND WASHERS.
5. CONDUIT PROJECTS ABOVE FOUNDATION SHALL BE 2" MIN. TO 4" MAX. CONDUITS SHALL BE CAPPED.
6. 1" SLEEVE FOR GROUND ROD, EXACT LOCATION PER CABINET MANUFACTURERS REQUIREMENTS.
7. IN UNPAVED AREAS A RAISED PCC PAD 36" x 4" x 36" SHALL BE PLACED IN FRONT OF THE CABINET. THE PAD SHALL BE SET 2" BELOW THE FOUNDATION ELEVATION AND SLOPED AWAY FROM CABINET.
8. CONFIRM ACTUAL ANCHOR BOLT LAYOUT DIMENSIONS AS SHOWN PER THE TABLE ON THIS DRAWING PRIOR TO CONSTRUCTION.
9. A METER PEDESTAL SHALL BE PROVIDED FOR ELECTRICAL SERVICES FOR TRAFFIC SIGNALS WHEN A SEPARATE SERVICE CABINET IS SPECIFIED. THIS CABINET CAN BE USED FOR OTHER PURPOSES AS WELL, SEE PLAN.
10. CABINETS SHALL BE OFFSET A MINIMUM OF 6 FT. FROM ANY ROADWAY AND 5 FT. FROM CONTROLLER CABINET, UPS CABINET, SERVICE POLE OR PAD MOUNTED TRANSFORMER.



FRONT VIEW

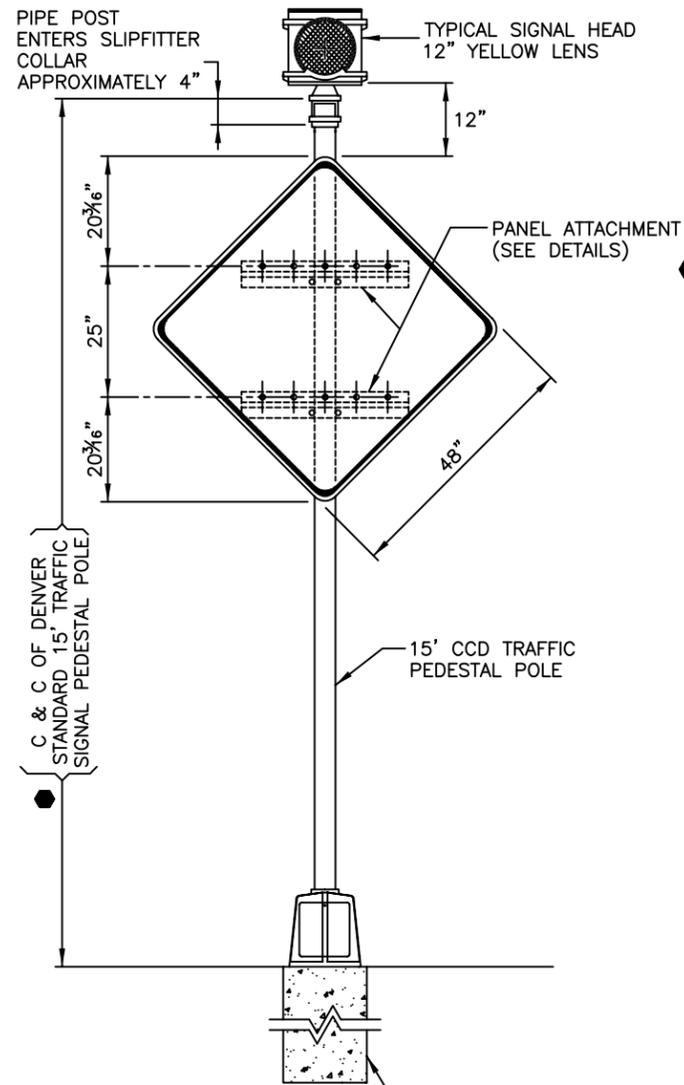


RIGHT SIDE VIEW

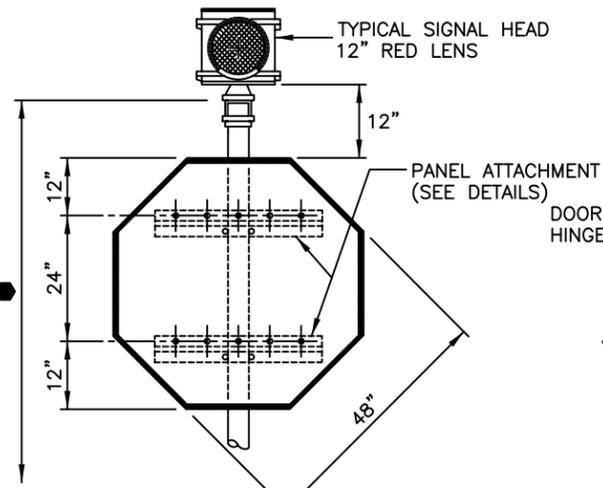
METER PEDESTAL CABINET FOUNDATION DETAIL

CITY & COUNTY OF DENVER		 STD DWG NO 16.1.20 DATE 1/12/12
METER PEDESTAL CABINET FOUNDATION AND BASE		

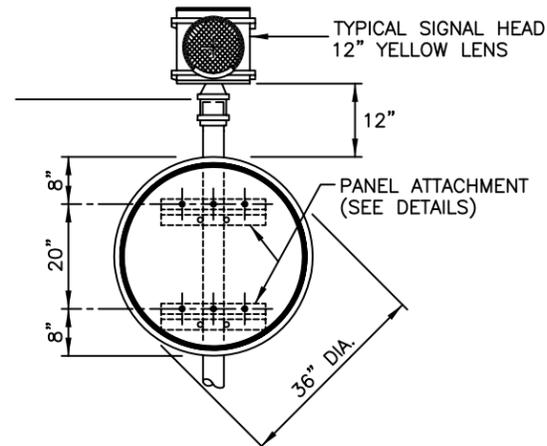
COMPLETE INSTALLATION
WITH DIAMOND PANEL



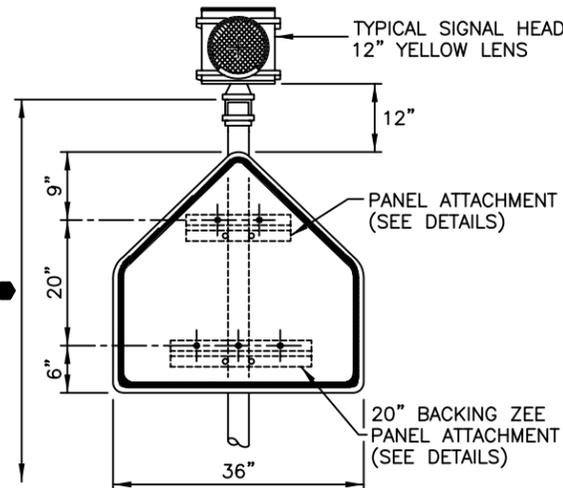
WITH OCTAGON PANEL



WITH CIRCLE PANEL



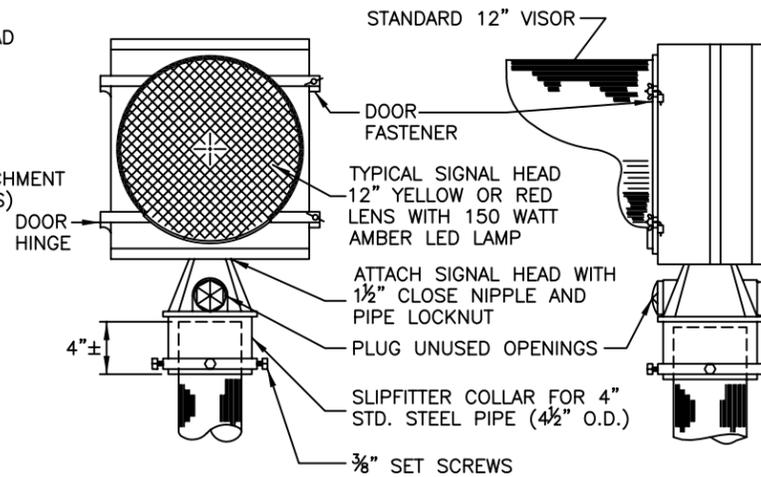
WITH PENTAGON PANEL



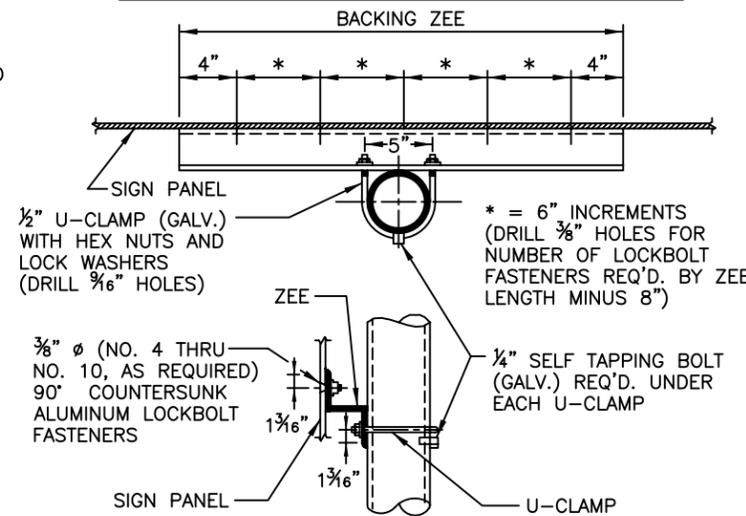
WITH PANELS NOT ILLUSTRATED

- 48" CIRCLE (12" YELLOW LENS)
VERTICAL SPACING: 10 1/2"-27"-10 1/2"
BACKING ZEES: 20"
- 48" PENTAGON (12" YELLOW LENS)
VERTICAL SPACING TOP TO BOTTOM: 12"-25 3/4"-9"
- 24" x 48" RECTANGLE (12" YELLOW LENS) (SCHOOL SPEED LIMIT)
VERTICAL SPACING: 12"-24"-12"
BACKING ZEES: 20"

TYPICAL ELEVATION FACING TRAFFIC



TYPICAL SIGNAL HEAD - 12 INCH LENS



TYPICAL PANEL ATTACHMENT DETAILS

GENERAL NOTES

1. ALL SIGN PANELS USED ON FLASHING BEACONS ARE CLASS II AND SHALL BE FABRICATED IN ACCORDANCE WITH
 - A. PANELS SHALL BE SINGLE SHEET ALUMINUM 0.100 MINIMUM THICKNESS.
 - B. BACKING ZEES ARE 3 IN. x 2 / IN. 2.33 LBS. PER FT. ALUMINUM.
 - C. ALL SIGNS SHALL BE FABRICATED USING RETROREFLECTIVE SHEETING CONFORMING TO ASTM D4956. THE TYPE SHALL BE DESCRIBED IN THE STANDARD SPECIFICATIONS AND/OR AS SHOWN ON THE PLANS.
 - D. BOLTS, U-CLAMPS, NUTS AND METAL WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
2. INSTALLATION DESIGN CONFORMS WITH AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" AND SHALL BE FABRICATED IN ACCORDANCE WITH:
 - A. STEEL PIPE, POST ANCHOR PLATES AND BREAK-AWAY PLATES SHALL CONFORM TO AASHTO M270 (ASTM A709) GRADE 36.
 - B. HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM-A325 AND SHALL BE GALVANIZED OR CADMIUM PLATED.
 - C. HOLES SHALL BE DRILLED AND CUTS SHALL PREFERABLY BE SAW CUTS; HOWEVER, FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND. METAL SHALL NOT PROJECT BEYOND THE PLANE OF THE PLATE FACE ON BREAK-AWAY PLATES.
 - D. ALL WELDING IS TO BE CONTINUOUS AND IN ACCORDANCE WITH CURRENT AWS SPECIFICATIONS.
 - E. A "KEEPER PLATE" OF THIN (28 GAGE) GALVANIZED SHEET METAL, FABRICATED TO MATCH BREAK-AWAY PLATE DIMENSIONS BUT WITH HOLES RATHER THAN SLOTS, SHALL BE USED TO RESTRAIN BOLT LOOSENING DUE TO WIND VIBRATION.
 - F. FLASHING BEACON POLE SHALL BE THE CITY AND COUNTY OF DENVER TRAFFIC ENGINEERING SERVICE STANDARD PEDESTAL POLE. POLE SHALL BE THE STANDARD 15' POLE WITH THE SQUARE ALUMINUM POLE BASE. FOUNDATION FOR THE PEDESTAL POLE BASE SHALL BE THE 6' DEEP POLE FOOTING FOR THE 15' PEDESTAL POLE (SEE DETAIL 5 IN SHEET 16.13).
 - G. 48" PANELS AND LARGER USE "Z" BAR, SMALLER PANELS USE ALTERNATE DETAIL.

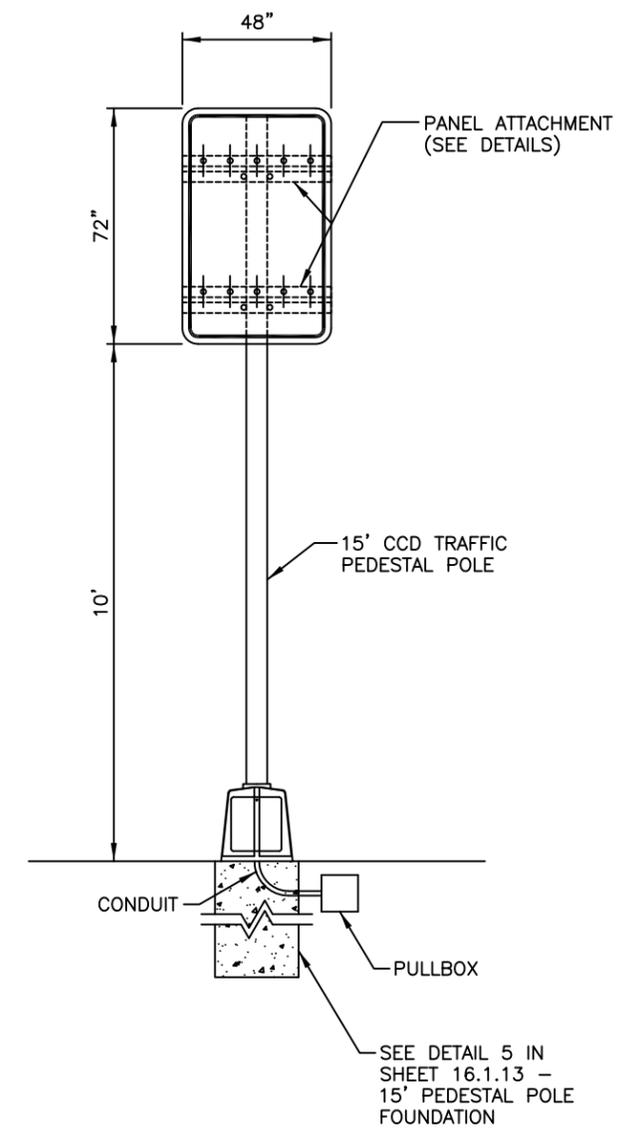
CITY & COUNTY OF DENVER

FLASHING BEACON DETAILS

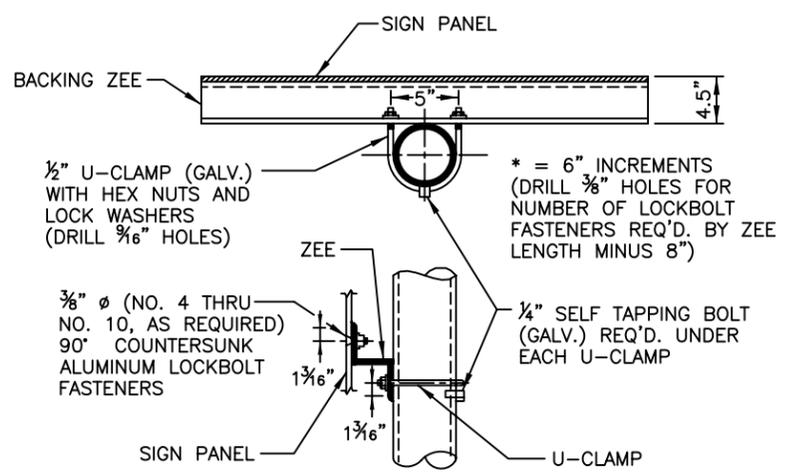


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TYPICAL ELEVATION FACING TRAFFIC

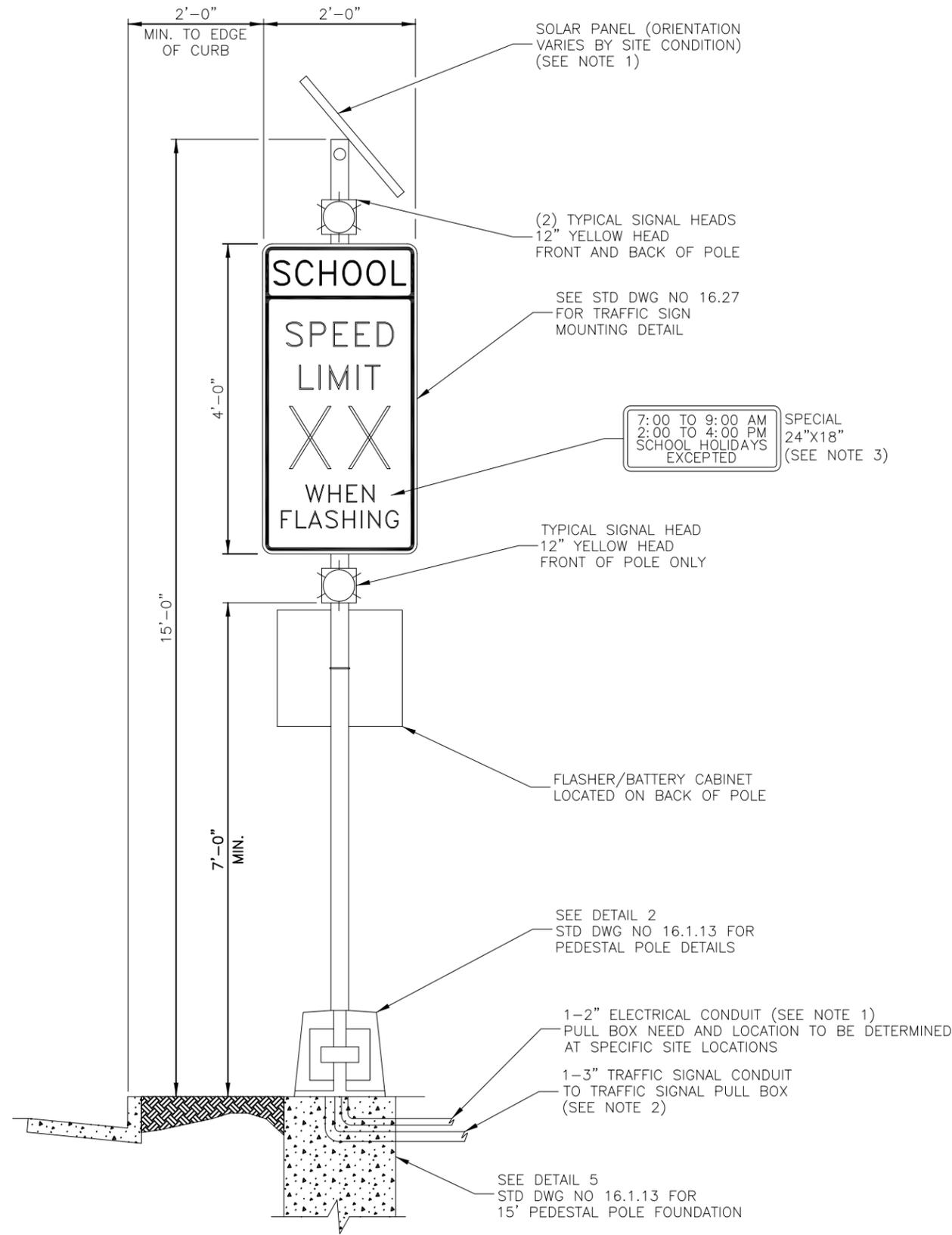


TYPICAL PANEL ATTACHMENT DETAILS

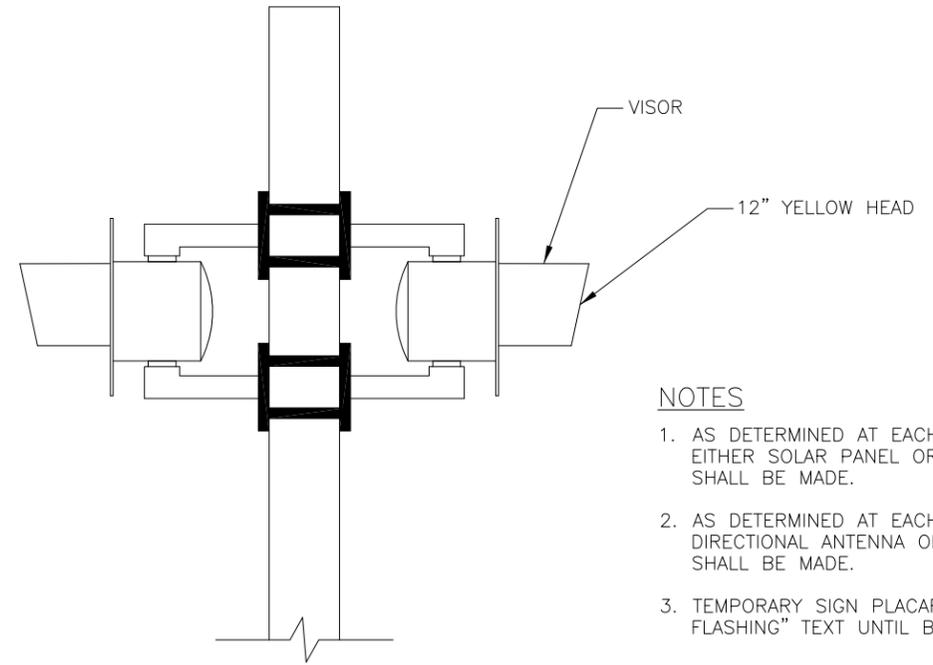
GENERAL NOTES

1. INSTALLATION DESIGN CONFORMS WITH AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" AND SHALL BE FABRICATED IN ACCORDANCE WITH:
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 - C. HOLES SHALL BE DRILLED AND CUTS SHALL PREFERABLY BE SAW CUTS; HOWEVER, FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND. METAL SHALL NOT PROJECT BEYOND THE PLANE OF THE PLATE FACE ON BREAK-AWAY PLATES.
 - D. ALL WELDING IS TO BE CONTINUOUS AND IN ACCORDANCE WITH CURRENT AWS SPECIFICATIONS.
 - E. A "KEEPER PLATE" OF THIN (28 GAGE) GALVANIZED SHEET METAL, FABRICATED TO MATCH BREAK-AWAY PLATE DIMENSIONS BUT WITH HOLES RATHER THAN SLOTS, SHALL BE USED TO RESTRAIN BOLT LOOSENING DUE TO WIND VIBRATION.
 - F. DRIVER FEEDBACK SIGN POLE SHALL BE MOUNTED ON THE CITY AND COUNTY OF DENVER TRAFFIC ENGINEERING SERVICE STANDARD PEDESTAL POLE. POLE SHALL BE THE STANDARD 15' POLE WITH THE SQUARE ALUMINUM POLE BASE. FOUNDATION FOR THE PEDESTAL POLE BASE SHALL BE THE 6' DEEP POLE FOOTING FOR THE 15' PEDESTAL POLE (SEE DETAIL 5 IN SHEET 16.1.3).
 - G. BOLTS, U-CLAMPS, NUTS AND METAL WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.

CITY & COUNTY OF DENVER		 STD DWG NO 16.1.22 DATE 1/12/12
DRIVER'S FEEDBACK SIGN DETAILS		



TYPICAL ELEVATION FACING TRAFFIC

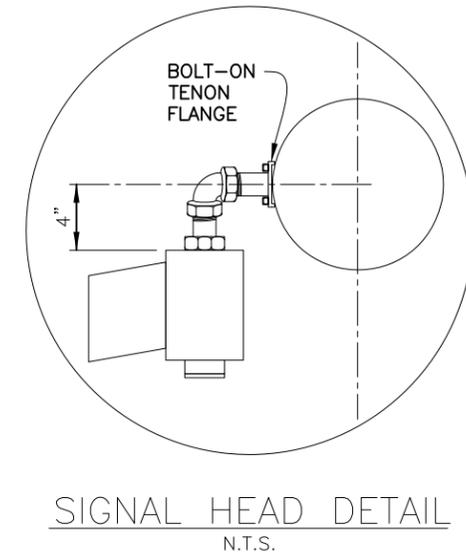
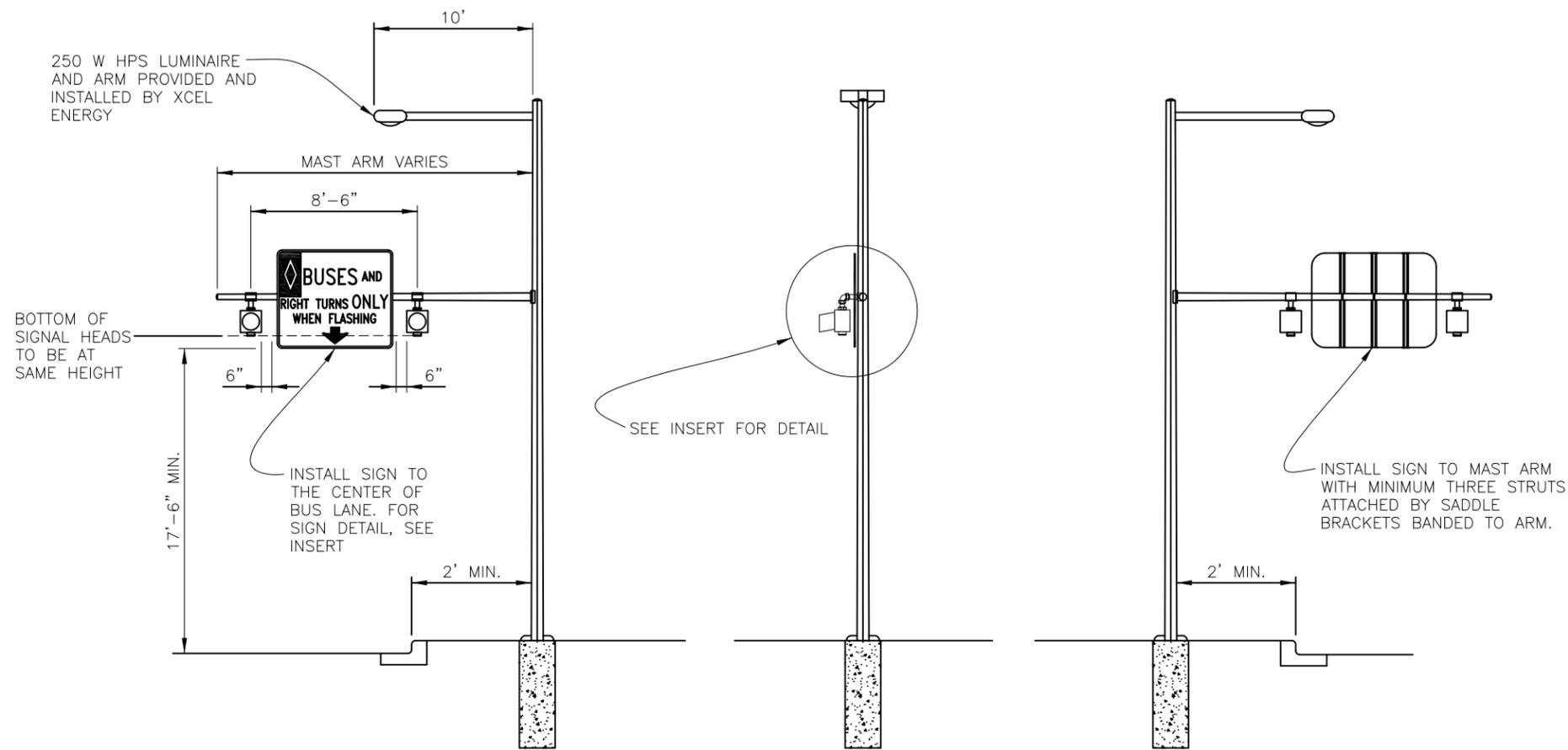


TYPICAL SIGNAL HEAD SECTION - 12" LENS

NOTES

1. AS DETERMINED AT EACH SPECIFIC SITE LOCATION, FOR POWER, EITHER SOLAR PANEL OR HARD-WIRE ELECTRICAL CONNECTION SHALL BE MADE.
2. AS DETERMINED AT EACH SPECIFIC SITE LOCATION, EITHER DIRECTIONAL ANTENNA OR HARD-WIRE TRAFFIC SIGNAL CONNECTION SHALL BE MADE.
3. TEMPORARY SIGN PLACARD TO BE INSTALLED OVER S5-1 "WHEN FLASHING" TEXT UNTIL BEACONS ARE OPERATIONAL.

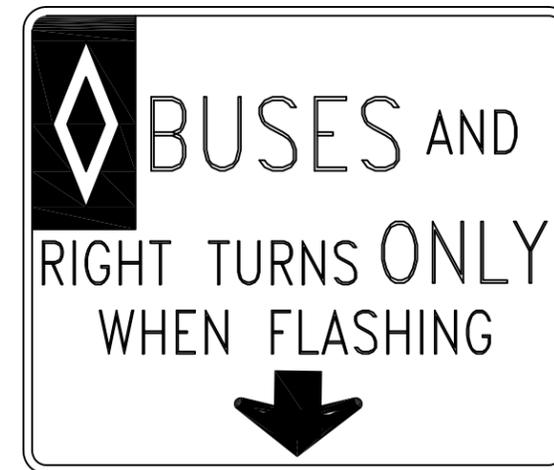
CITY & COUNTY OF DENVER		 STD DWG NO 16.1.23 DATE 1/12/12
FLASHING BEACON & SIGN SHEET 1		



BUS LANE SIGN & SIGNAL FLASHER:
20' MAST ARM DESIGN
N.T.S

BUS FLASHER SIGN & SIGNAL NOTES:

1. INSTALL CABLE (2 CONDUCTOR #12 AWG) IMSA TO SIGNAL BOX, FM. (BY CCD)
2. FLASHER WORK SHALL BE PERFORMED BY A QUALIFIED SIGNAL CONTRACTOR.
3. INSTALL NEW 12" YELLOW LED FLASHERS (2 EACH)
4. CONTACT TRAFFIC OPERATIONS AT 720-865-4000 FOR SIGN SPECIFICATIONS.
5. POLES SHALL BE FURNISHED AND INSTALLED BY XCEL ENERGY
6. DURING MOUNTING OF SIGN PANEL, NO TRAFFIC WILL BE ALLOWED IN THE AFFECTED LANE
7. LUMINAIRE AND LUMINAIRE ARM MAY BE PROVIDED AND INSTALLED BY XCEL ENERGY.



BUS FLASHER SIGN DETAIL

CITY & COUNTY OF DENVER

FLASHING BEACON & SIGN SHEET 2

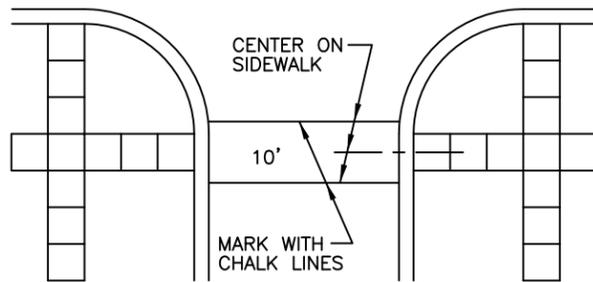


STD DWG NO
16.1.24

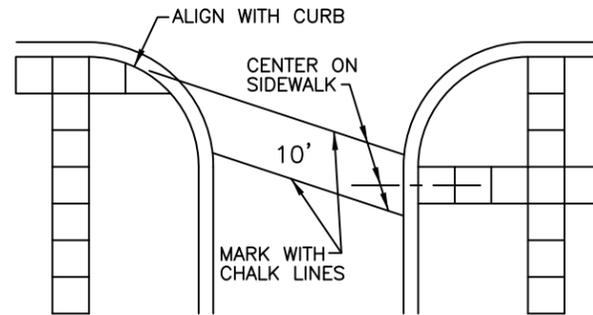
DATE
1/12/12

TYPICAL CROSSWALK LAYOUT PROCEDURES

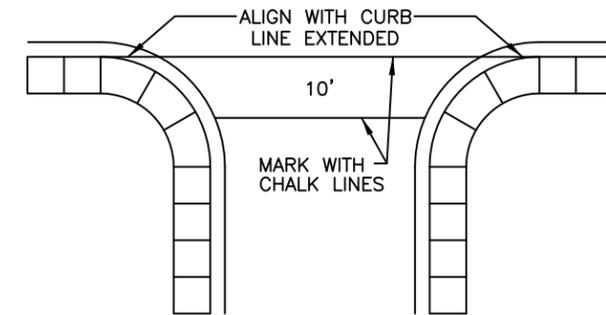
1. SETBACK SIDEWALKS



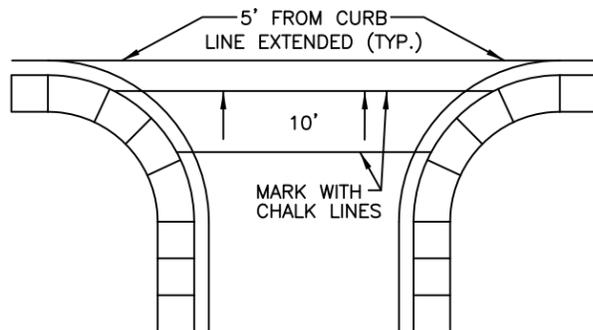
2. SETBACK SIDEWALK ONE SIDE
ATTACHED SIDEWALK OTHER SIDE



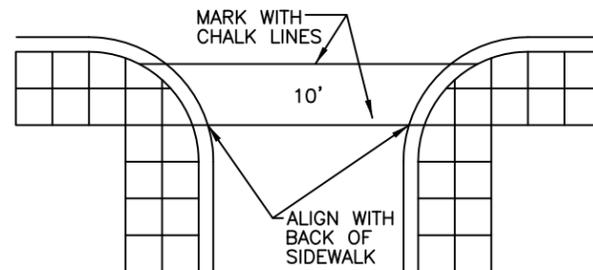
3. ATTACHED SIDEWALK
5' TO 15' CORNER RADIUS



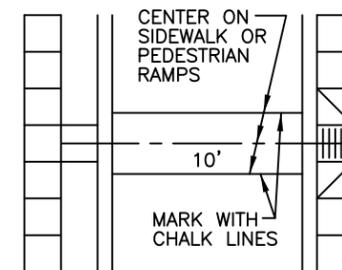
4. ATTACHED SIDEWALK
20' TO 30' CORNER RADIUS



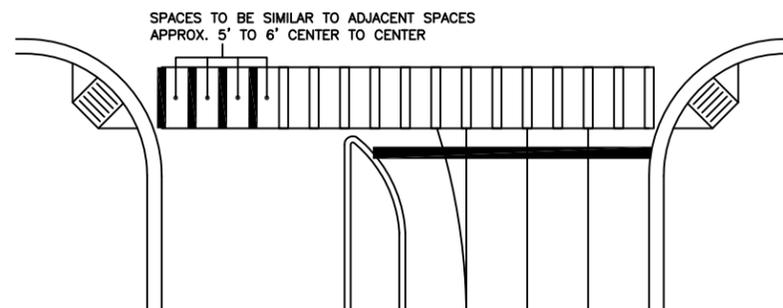
5. ATTACHED SIDEWALK WIDER THAN 10'



6. MID-BLOCK CROSSWALK

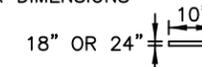


7. INSTALL STOP LINE 4' IN ADVANCE OF AND
PARALLEL TO THE NEAREST CROSSWALK LINE
UNLESS OTHERWISE SHOWN



NOTE:

1. CROSSWALK BAR DIMENSIONS



USE 18" WIDTH FOR CROSSWALK BARS UNLESS ON A STATE ROUTE OR DIRECTLY ADJACENT TO A STATE ROUTE.

2. KEEP BARS PARALLEL TO LANE LINES EVEN IF THE CROSSWALK IS SKEWED. SEE EXAMPLE.

3. ALL BARS IN EACH CROSSWALK MUST BE SAME WIDTH.

4. ADJUST TRANSVERSE ALIGNMENT IF NECESSARY TO ALIGN PROPERLY WITH PEDESTRIAN RAMPS. CROSSWALKS SHOULD CENTER ON PEDESTRIAN RAMPS WHEN POSSIBLE.

5. CROSSWALKS SHOULD NOT EXTEND PAST THE CURB LINE OF ADJACENT ROADWAY.

CITY & COUNTY OF DENVER

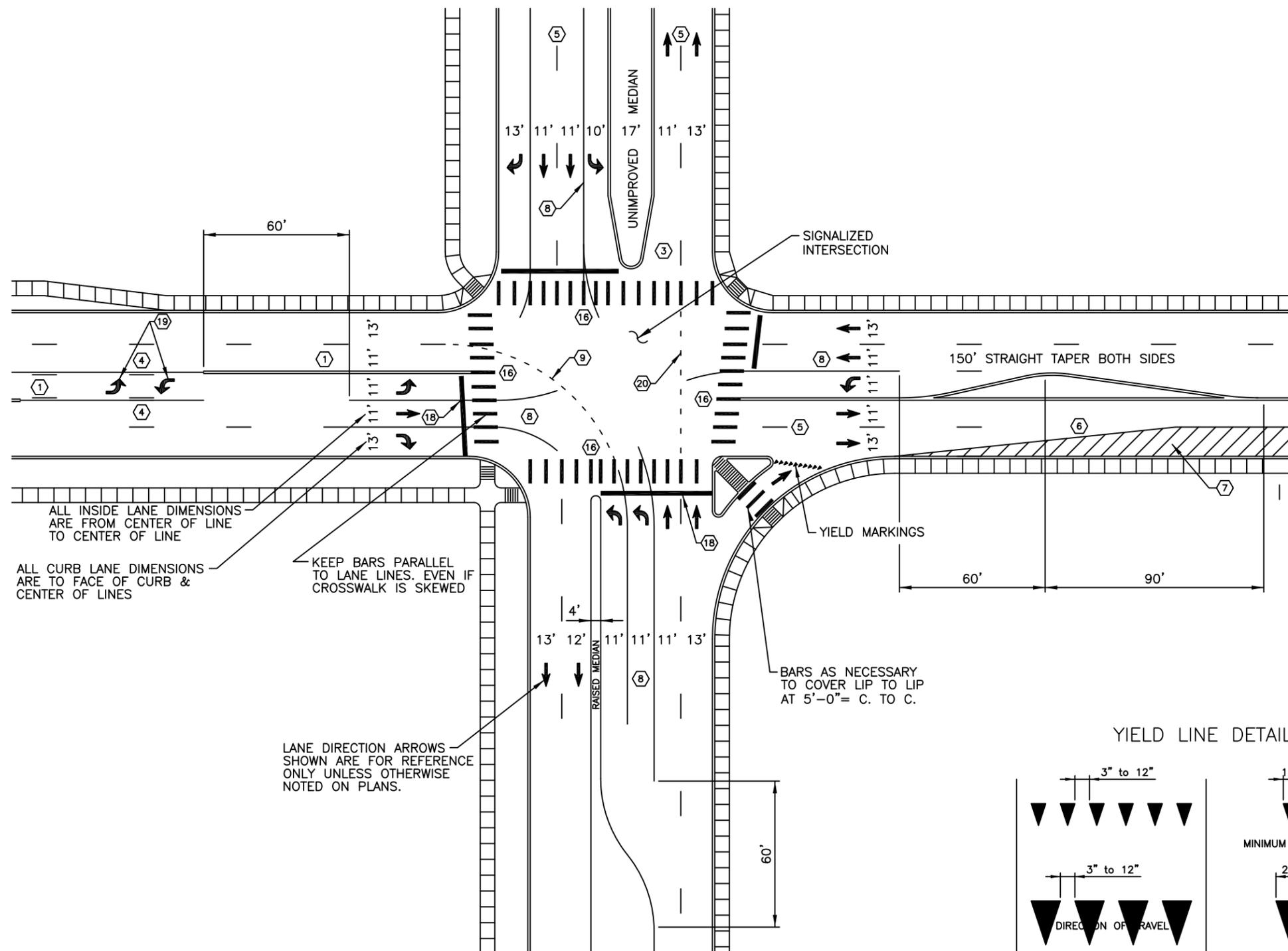
CROSSWALK LAYOUT DETAILS



STD DWG NO
16.2.1

DATE
1/12/12

TYPICAL PAVEMENT MARKING EXAMPLES



PAVEMENT MARKING LEGEND AND NOTES

A. TRAFFIC LANE PAVEMENT MARKINGS

EPOXY PAVEMENT MARKING MATERIAL SHALL BE USED UNLESS OTHERWISE APPROVED BY T.E.S.

ASPHALT ROADWAY SURFACE:
INLAID PREFORMED PLASTIC TAPE SHALL BE USED FOR ⑤⑨⑳ UNLESS OTHERWISE APPROVED BY T.E.S.

CONCRETE ROADWAY SURFACE:
INLAID PREFORMED PLASTIC TAPE (CONTRAST) PAVEMENT MARKING MATERIAL SHALL BE USED FOR ⑤⑨⑳ UNLESS OTHERWISE APPROVED BY T.E.S.

- ① 4" DOUBLE YELLOW CENTERLINE WITH 4" SEPARATION
- ② 4" SKIP YELLOW CENTERLINE, 10' LINE, 30' GAP
- ③ 4" SOLID YELLOW TWO WAY LEFT EDGE LINE
- ④ 4" SOLID YELLOW WITH 4" SKIP YELLOW, 10' LINE, 30' GAP, AND 4" SEPARATION
- ⑤ 4" SKIP WHITE LANE LINE, 10' LINE, 30' GAP
- ⑥ 4" SOLID WHITE RIGHT EDGE LINE OR TURN LANE LINE
- ⑦ 4" SOLID WHITE 45° DIAGONAL CROSSHATCH AT 15' SPACING
- ⑧ 8" SOLID WHITE RIGHT EDGE LINE OR TURN LANE LINE
- ⑨ 8" DASHED WHITE LINE, 2' DASH WITH 4' GAP
- ⑳ DASHES THRU INTERSECTION WHEN SHOWN ON PLANS ARE 2' LONG LINES WITH 6' GAPS CENTERED IN EACH CROSS STREET TRAFFIC LANE

B. CROSSWALK MARKINGS – MATERIAL SHALL BE REFLECTORIZED PREFORMED THERMO-PLASTIC (MIN. 90 MIL THICKNESS) FULL WIDTH WITHOUT SEAMS UNLESS OTHERWISE SPECIFIED

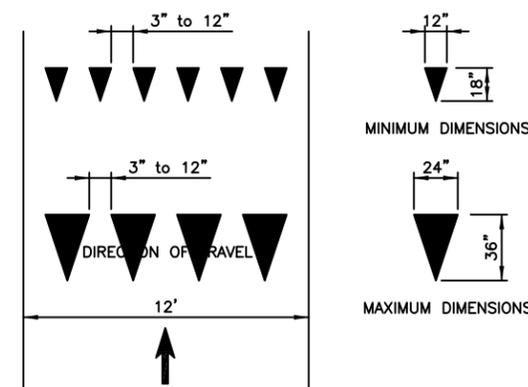
- ⑮ 18" WHITE TRAVERSE CROSSWALK LINE
- ⑯ 18" X 10' WHITE CROSSWALK BAR
- ⑰ 24" X 10' WHITE CROSSWALK BAR
- ⑱ 24" WHITE STOP LINE, ONLY WHEN SHOWN ON PLANS
- ⑲ PAVEMENT MESSAGES ONLY WHEN SHOWN ON PLANS

C. ANY FINAL PAVEMENT MARKING QUANTITIES SHALL INCLUDE REMOVAL OF ANY CONFLICTING, PREVIOUS OR DETOUR MARKINGS AS NECESSARY.

D. ALL OTHER PROVISIONS OF "CITY AND COUNTY OF DENVER STANDARDS AND SPECIFICATIONS: AND "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", STATE DEPARTMENT OF HIGHWAYS, STATE OF COLORADO, CURRENT EDITION SHALL APPLY.

E. ALL REMOVALS SHALL BE BY GRINDING, SANDBLASTING OR WATER BLASTING METHODS PROVIDED THAT THE PAVEMENT SURFACE SHALL NOT BE MATERIALLY DAMAGED. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY SHALL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS.

YIELD LINE DETAILS



NOTE:
TRIANGLE HEIGHT IS EQUAL TO 1.5 TIMES THE BASE DIMENSION.

YIELD LINES MAY BE SMALLER THAN SUGGESTED WHEN INSTALLED ON MUCH NARROWER, SLOW-SPEED FACILITIES SUCH AS SHARED-USE PATHS.

CITY & COUNTY OF DENVER

PAVEMENT MARKING DETAILS SHEET 1



STD DWG NO
16.2.2

DATE
1/12/12

TYPICAL PAVEMENT MARKING EXAMPLES

PAVEMENT MARKING LEGEND AND NOTES

A. TRAFFIC LANE PAVEMENT MARKINGS

EPOXY PAVEMENT MARKING MATERIAL SHALL BE USED UNLESS OTHERWISE APPROVED BY T.E.S.

ASPHALT ROADWAY SURFACE:
INLAID PREFORMED PLASTIC TAPE SHALL BE USED FOR (5)(9)(20) UNLESS OTHERWISE APPROVED BY T.E.S.

CONCRETE ROADWAY SURFACE:
INLAID PREFORMED PLASTIC TAPE (CONTRAST) PAVEMENT MARKING MATERIAL SHALL BE USED FOR (5)(9)(20) UNLESS OTHERWISE APPROVED BY T.E.S.

- (1) 4" DOUBLE YELLOW CENTERLINE WITH 4" SEPARATION
- (2) 4" SKIP YELLOW CENTERLINE, 10' LINE, 30' GAP
- (3) 4" SOLID YELLOW TWO WAY LEFT EDGE LINE
- (4) 4" SOLID YELLOW WITH 4" SKIP YELLOW, 10' LINE, 30' GAP, AND 4" SEPARATION
- (5) 4" SKIP WHITE LANE LINE, 10' LINE, 30' GAP
- (6) 4" SOLID WHITE RIGHT EDGE LINE OR TURN LANE LINE
- (7) 4" SOLID WHITE 45° DIAGONAL CROSSHATCH AT 15' SPACING
- (8) 8" SOLID WHITE RIGHT EDGE LINE OR TURN LANE LINE
- (9) 8" DASHED WHITE LINE, 2' DASH WITH 4' GAP
- (20) DASHES THRU INTERSECTION WHEN SHOWN ON PLANS ARE 2' LONG LINES WITH 6' GAPS CENTERED IN EACH CROSS STREET TRAFFIC LANE

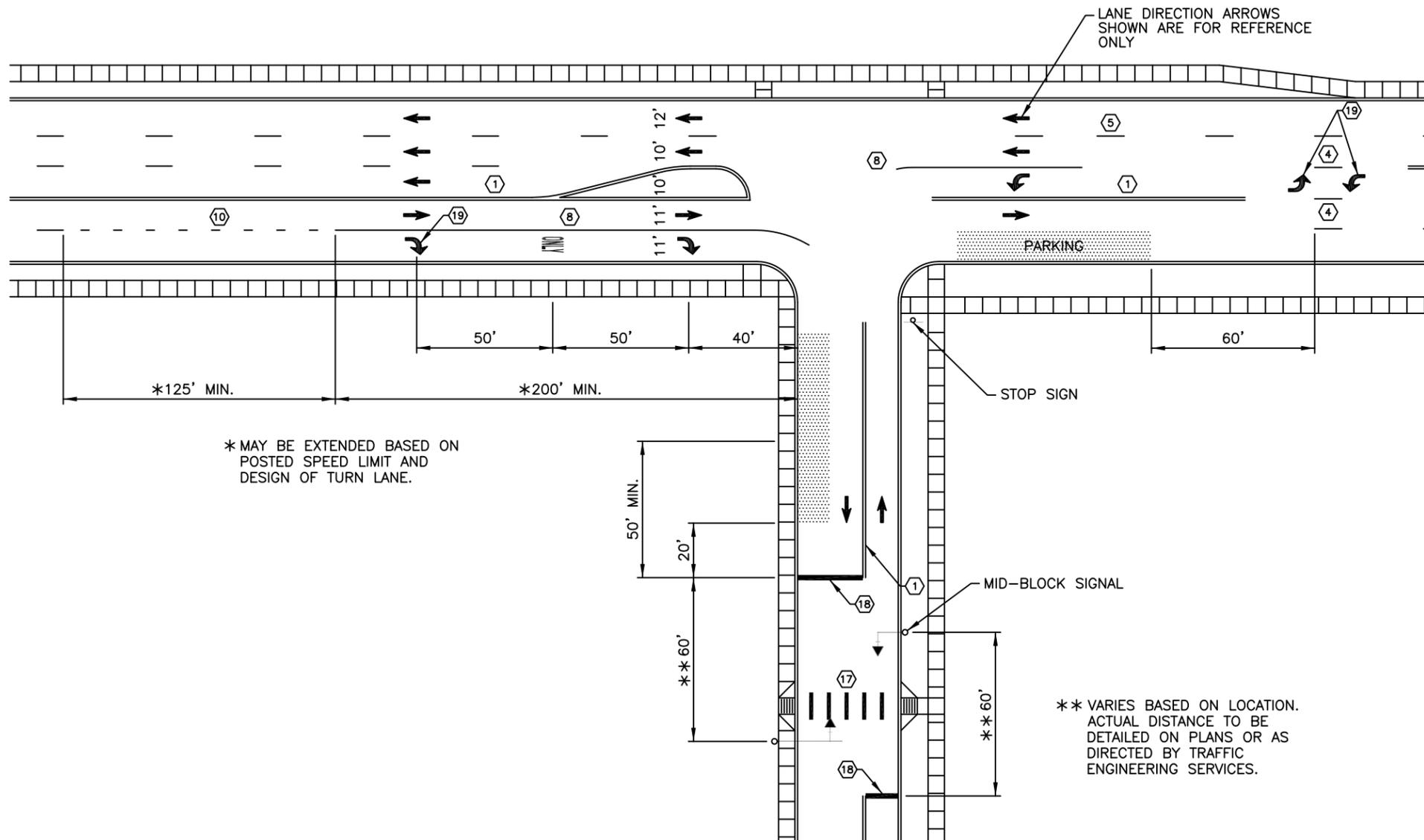
B. CROSSWALK MARKINGS - MATERIAL SHALL BE REFLECTORIZED PREFORMED THERMO-PLASTIC (MIN. 90 MIL THICKNESS) FULL WIDTH WITHOUT SEAMS UNLESS OTHERWISE SPECIFIED

- (15) 18" WHITE TRAVERSE CROSSWALK LINE
- (16) 18" X 10' WHITE CROSSWALK BAR
- (17) 24" X 10' WHITE CROSSWALK BAR
- (18) 24" WHITE STOP LINE, ONLY WHEN SHOWN ON PLANS
- (19) PAVEMENT MESSAGES ONLY WHEN SHOWN ON PLANS

C. ANY FINAL PAVEMENT MARKING QUANTITIES SHALL INCLUDE REMOVAL OF ANY CONFLICTING, PREVIOUS OR DETOUR MARKINGS AS NECESSARY.

D. ALL OTHER PROVISIONS OF "CITY AND COUNTY OF DENVER STANDARDS AND SPECIFICATIONS: AND "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", STATE DEPARTMENT OF HIGHWAYS, STATE OF COLORADO, CURRENT EDITION SHALL APPLY.

E. ALL REMOVALS SHALL BE BY GRINDING, SANDBLASTING OR WATER BLASTING METHODS PROVIDED THAT THE PAVEMENT SURFACE SHALL NOT BE MATERIALLY DAMAGED. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY SHALL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS.

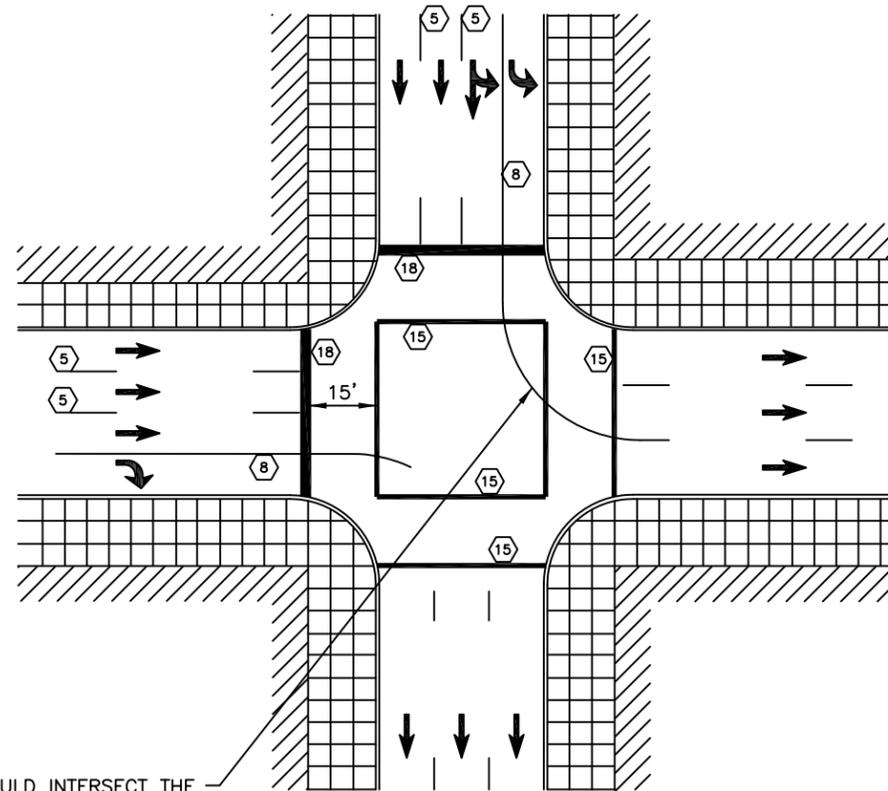


* MAY BE EXTENDED BASED ON POSTED SPEED LIMIT AND DESIGN OF TURN LANE.

** VARIES BASED ON LOCATION. ACTUAL DISTANCE TO BE DETAILED ON PLANS OR AS DIRECTED BY TRAFFIC ENGINEERING SERVICES.



TYPICAL CENTRAL BUSINESS DISTRICT
PAVEMENT MARKING EXAMPLES



TURN LANE LINE SHOULD INTERSECT THE
LANE LINE WHICH WILL PROVIDE THE TURN
LANE WITH TWO LANES GOING AWAY FROM
THE INTERSECTION, EXCEPT WHERE ONLY TWO
THROUGH LANES ARE AVAILABLE.

PAVEMENT MARKING LEGEND AND NOTES

- A. TRAFFIC LANE MARKINGS— MATERIAL SHALL BE EPOXY MARKING MATERIAL UNLESS OTHERWISE SPECIFIED.
 - ⑤ 4" SKIP WHITE LANE LINE, 10' LINE, 30' GAP
 - ⑥ 4" SOLID WHITE RIGHT EDGE LINE OR TURN LANE LINE
 - ⑧ 8" SOLID WHITE RIGHT EDGE LINE OR TURN LANE LINE
- B. CROSSWALK MARKINGS – MATERIAL SHALL BE REFLECTORIZED PREFORMED THERMO-PLASTIC FULL WIDTH WITHOUT SEAMS UNLESS OTHERWISE SPECIFIED
 - ⑮ 18" WHITE TRAVERSE CROSSWALK LINE
 - ⑰ 24" WHITE STOP LINE, ONLY WHEN SHOWN ON PLANS.
- C. ANY FINAL PAVEMENT MARKING QUANTITIES SHALL INCLUDE REMOVAL OF ANY CONFLICTING, PREVIOUS OR DETOUR MARKINGS AS NECESSARY.
- D. ALL OTHER PROVISIONS OF "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", STATE DEPARTMENT OF HIGHWAYS, STATE OF COLORADO, CURRENT EDITION SHALL APPLY.
- E. ALL REMOVALS SHALL BE BY GRINDING, SANDBLASTING OR WATER BLASTING METHODS PROVIDED THAT THE PAVEMENT SURFACE SHALL NOT BE MATERIALLY DAMAGED. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY SHALL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS.

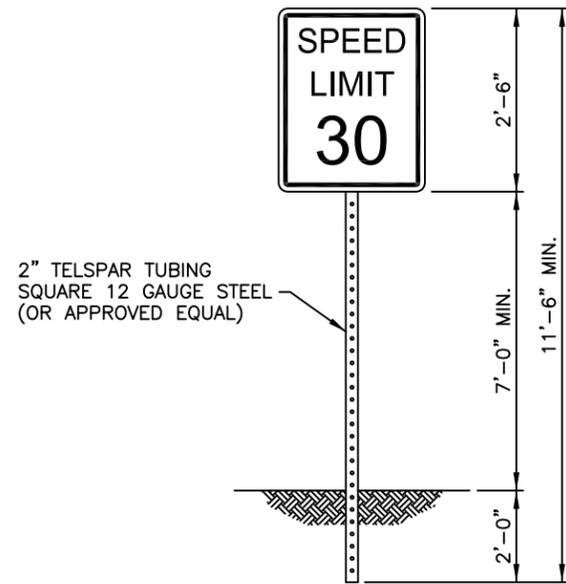
CITY & COUNTY OF DENVER

CENTRAL BUSINESS DISTRICT PAVEMENT MARKING DETAILS

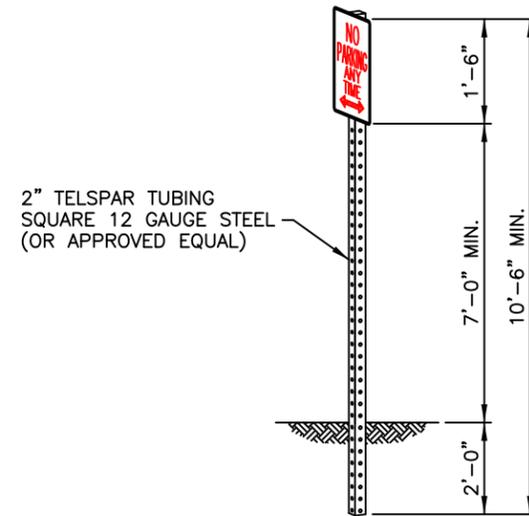


STD DWG NO
16.2.5

DATE
1/11/12



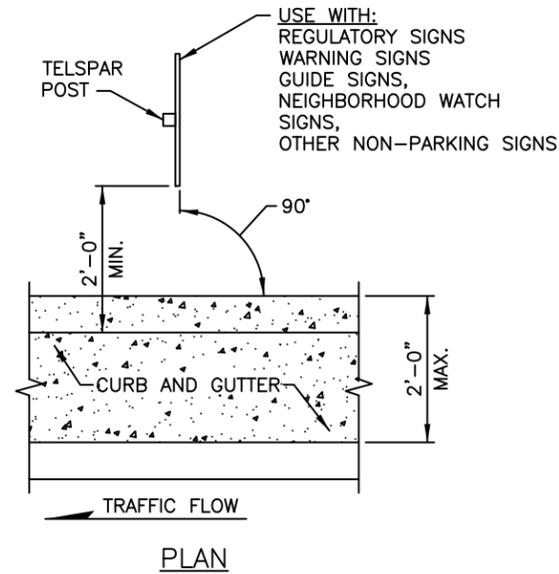
ELEVATION
OTHER REGULATORY OR WARNING SIGNS



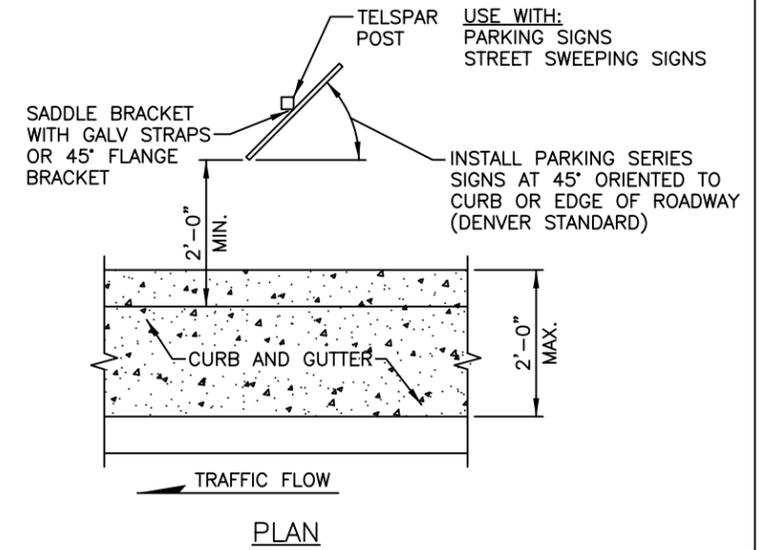
ELEVATION
PARKING SIGNS

NOTE

SIGNS: ALL SIGNS SHALL BE FABRICATED FROM ASTM TYPE XI, 4000 SERIES SIGN FACE SHEETING MATERIAL. ALL SIGNS ARE 0.080 GAUGE, 6061-T6 OR 5052-H38 ALUMINUM ALLOY, TREATED WITH ALONDINE 1200 CONVERSION COATING, 3/8 INCH DIAMETER HOLES PUNCHED, CENTERED ON TOP AND BOTTOM, HORIZONTAL AXIS WITH STANDARD 1-1/2 INCH RADIUS CORNERS. ALL IMAGING SHALL BE ACCOMPLISHED WITH A MATCH COMPONENT SYSTEM WITH ACRYLIC FILM THAT MATCHES THE WARRANTY OF THE BASE REFLECTIVE SHEETING. INKS SHALL NOT BE PERMITTED FOR IMAGING.

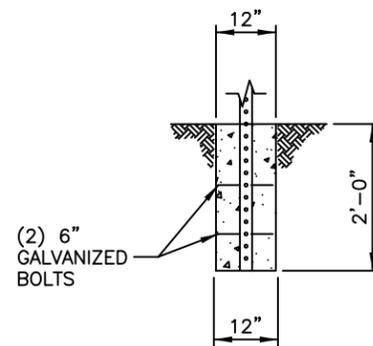


PLAN

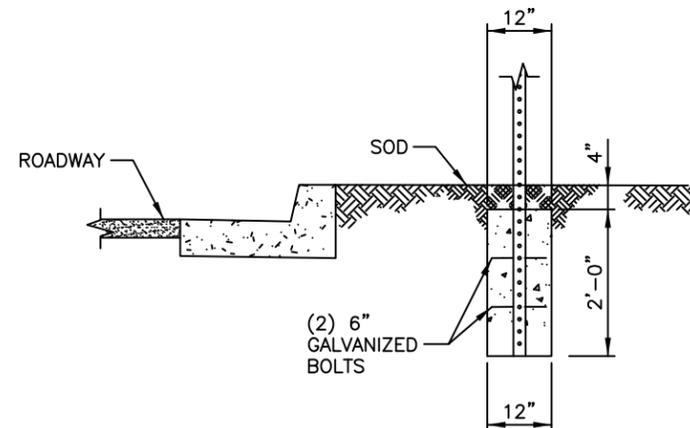


PLAN

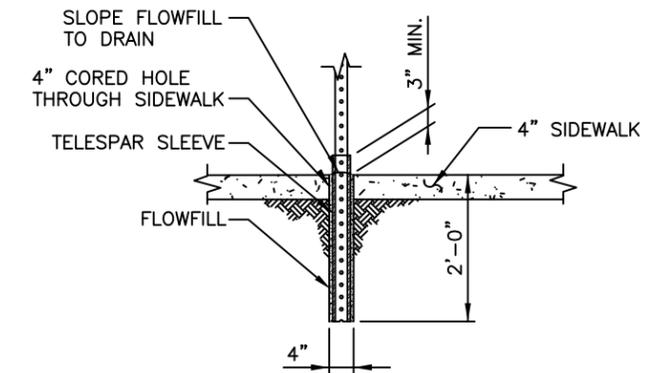
ROADSIDE SIGN INSTALLATION



DETAIL 1
MOUNTED IN DIRT



DETAIL 2
MOUNTED IN SOD/VEGETATION



DETAIL 3
MOUNTED IN SIDEWALK/HARDSCAPE

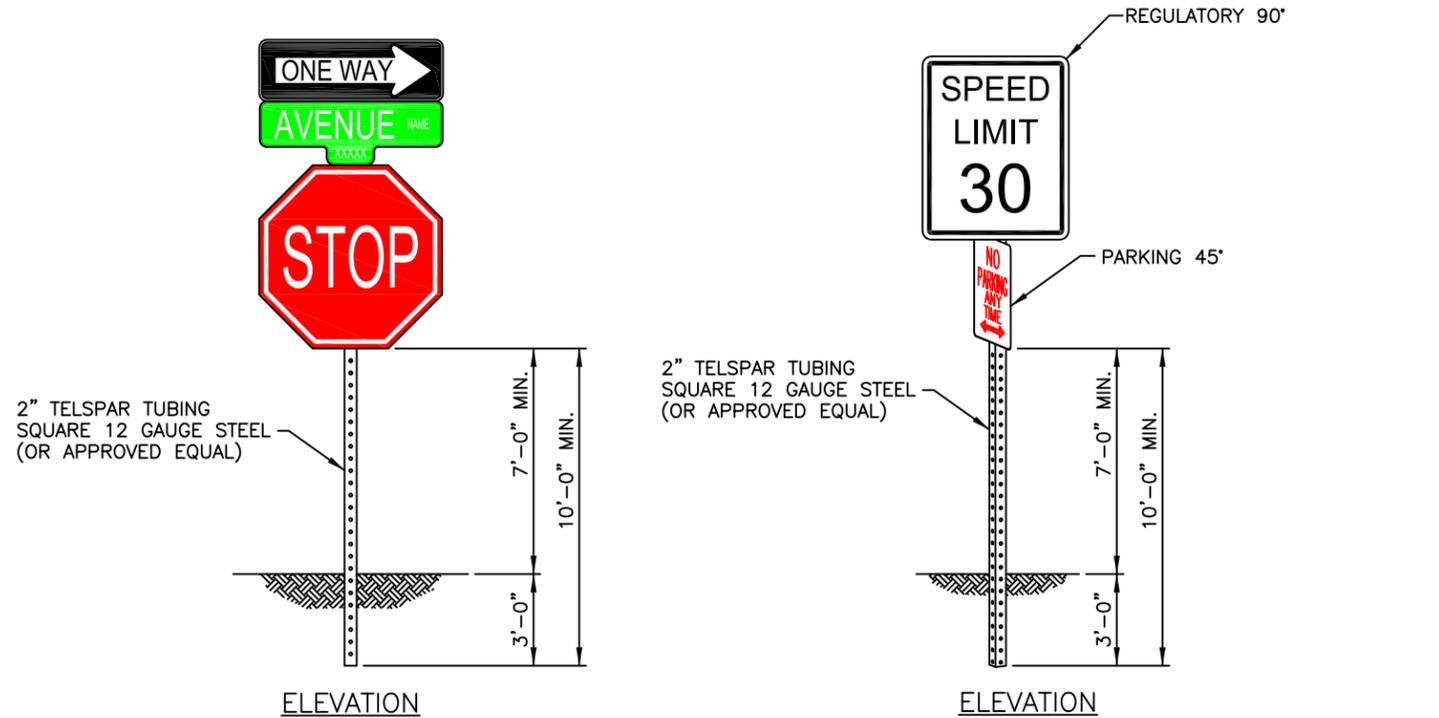
NOTE

MOUNTING IN SOD OR DIRT REQUIRES APPROXIMATELY 2.0 CU. FT. OF CONCRETE.

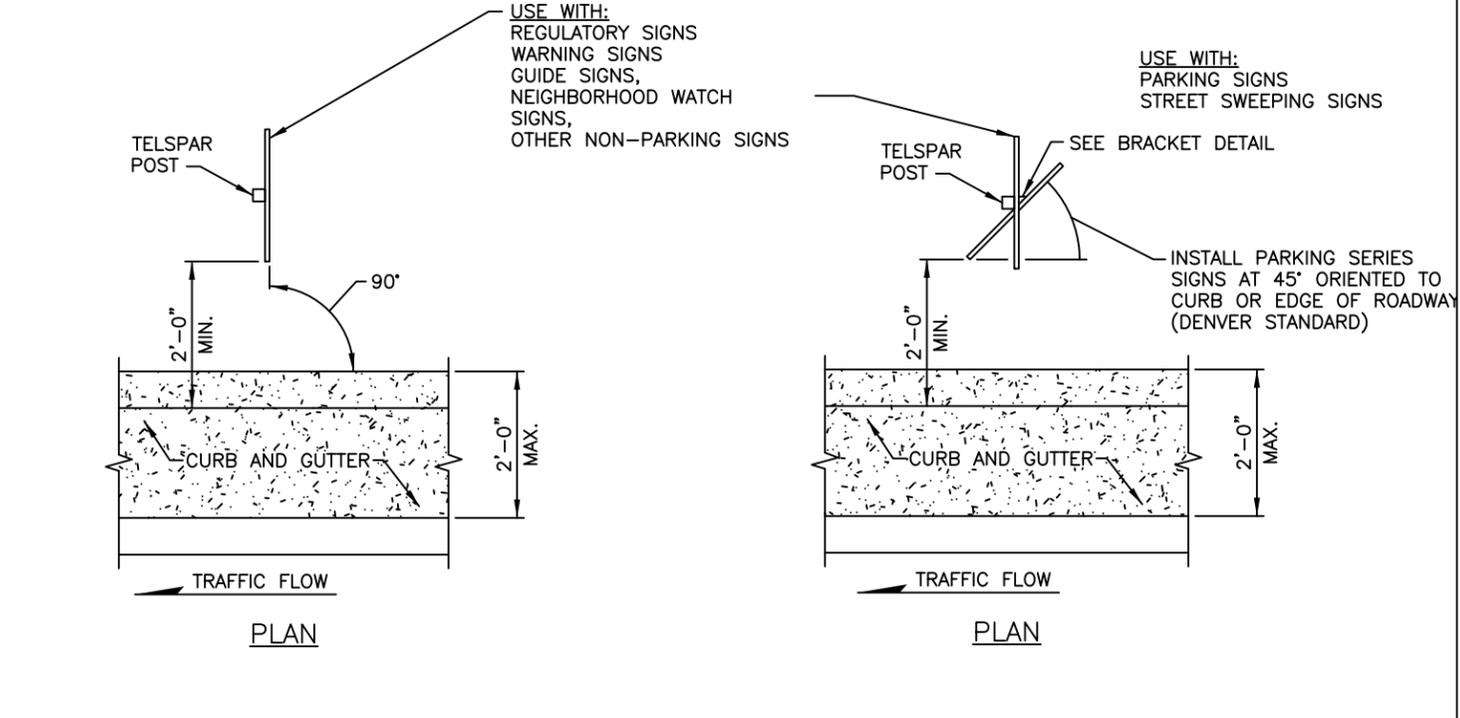
CITY & COUNTY OF DENVER
SINGLE SIGN POST MOUNTING DETAILS



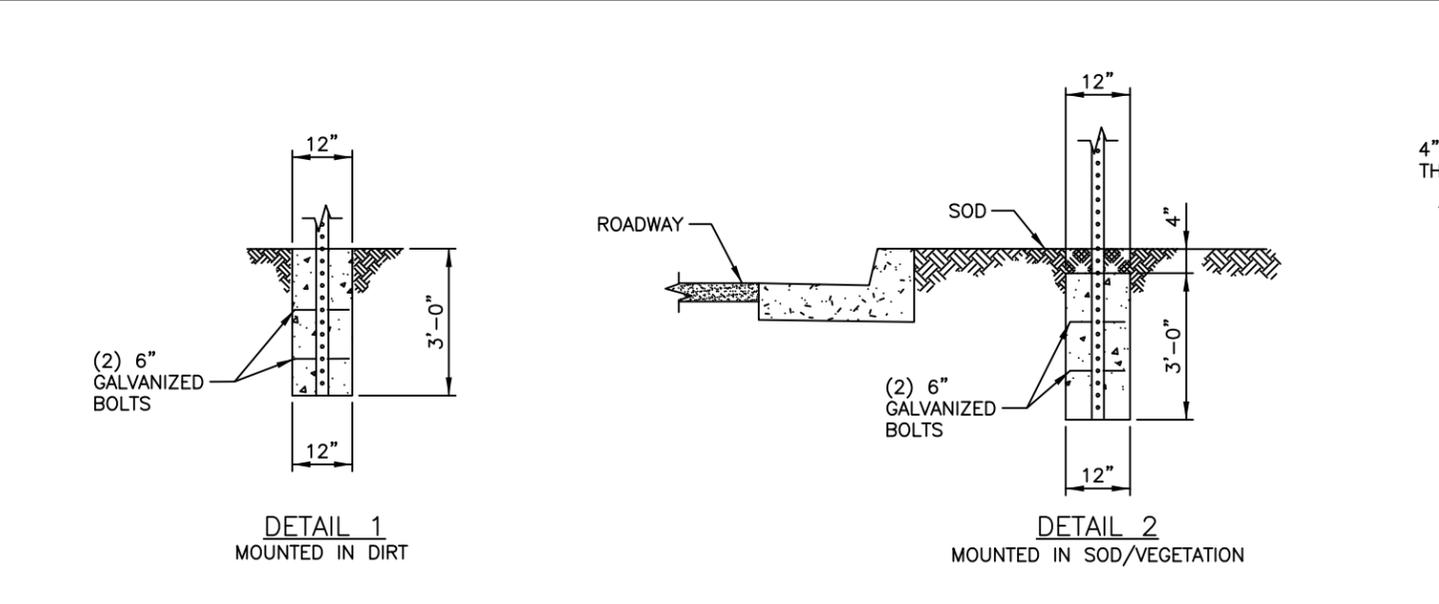
STD DWG NO
16.2.6
DATE
1/12/12



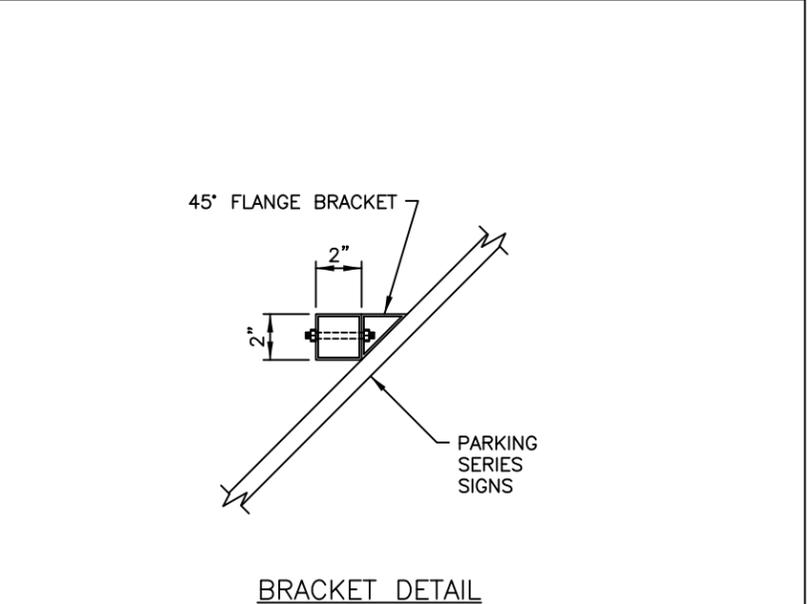
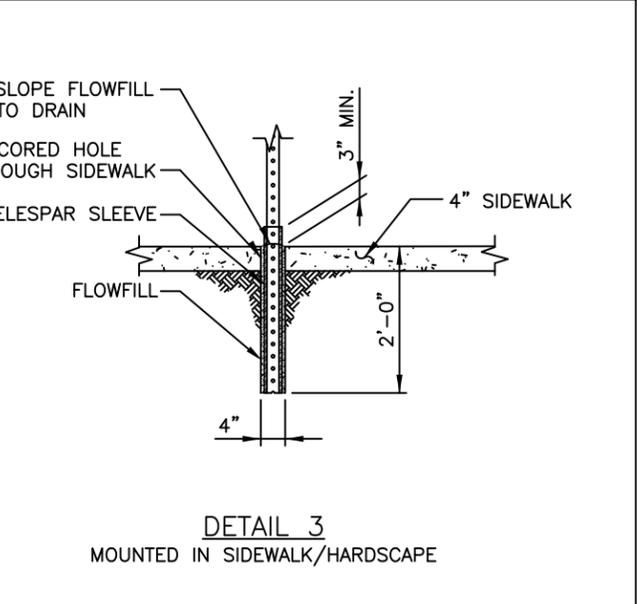
NOTE
 SIGNS: ALL SIGNS SHALL BE FABRICATED FROM ASTM TYPE XI, 4000 SERIES SIGN FACE SHEETING MATERIAL. ALL SIGNS ARE 0.080 GAUGE, 6061-T6 OR 5052-H38 ALUMINUM ALLOY, TREATED WITH ALONDINE 1200 CONVERSION COATING, 3/8 INCH DIAMETER HOLES PUNCHED, CENTERED ON TOP AND BOTTOM, HORIZONTAL AXIS WITH STANDARD 1-1/2 INCH RADIUS CORNERS. ALL IMAGING SHALL BE ACCOMPLISHED WITH A MATCH COMPONENT SYSTEM WITH ACRYLIC FILM THAT MATCHES THE WARRANTY OF THE BASE REFLECTIVE SHEETING. INKS SHALL NOT BE PERMITTED FOR IMAGING.

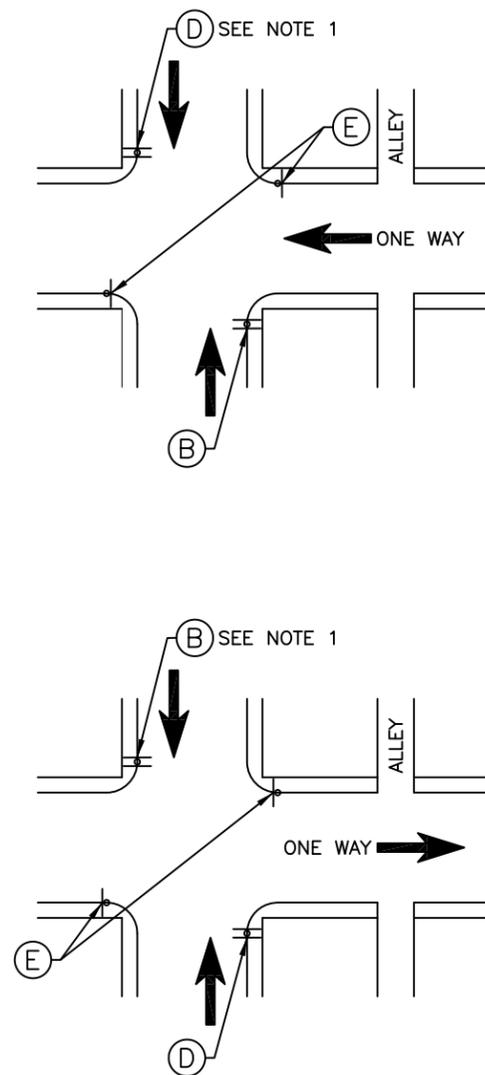


ROADSIDE SIGN INSTALLATION

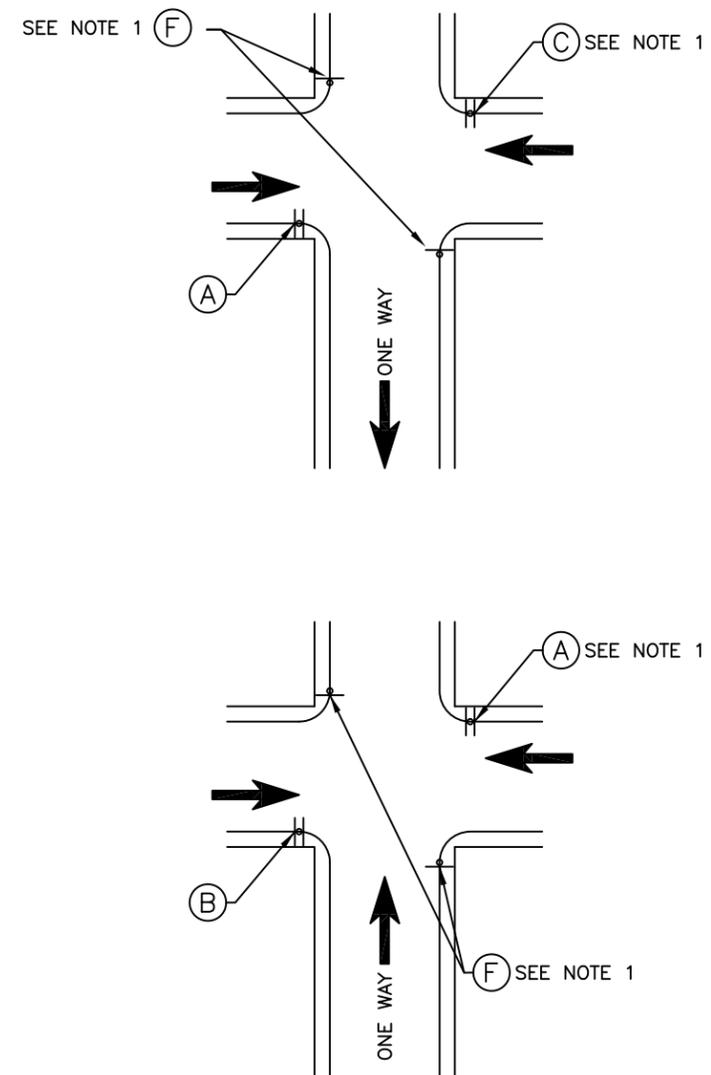


NOTE
 MOUNTING IN SOD OR DIRT REQUIRES APPROXIMATELY 3.0 CU. FT. OF CONCRETE.



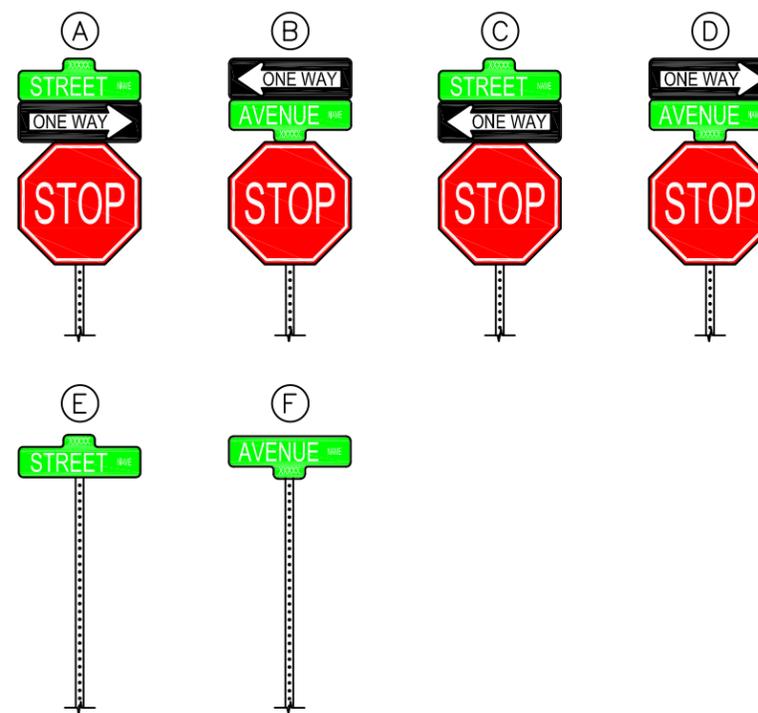


STANDARD SIGN PLACEMENT FOR STOP CONTROLLED INTERSECTIONS ALONG (EAST-WEST) ONE WAY STREETS



STANDARD SIGN PLACEMENT FOR STOP CONTROLLED INTERSECTIONS ALONG (NORTH - SOUTH) ONE WAY STREETS

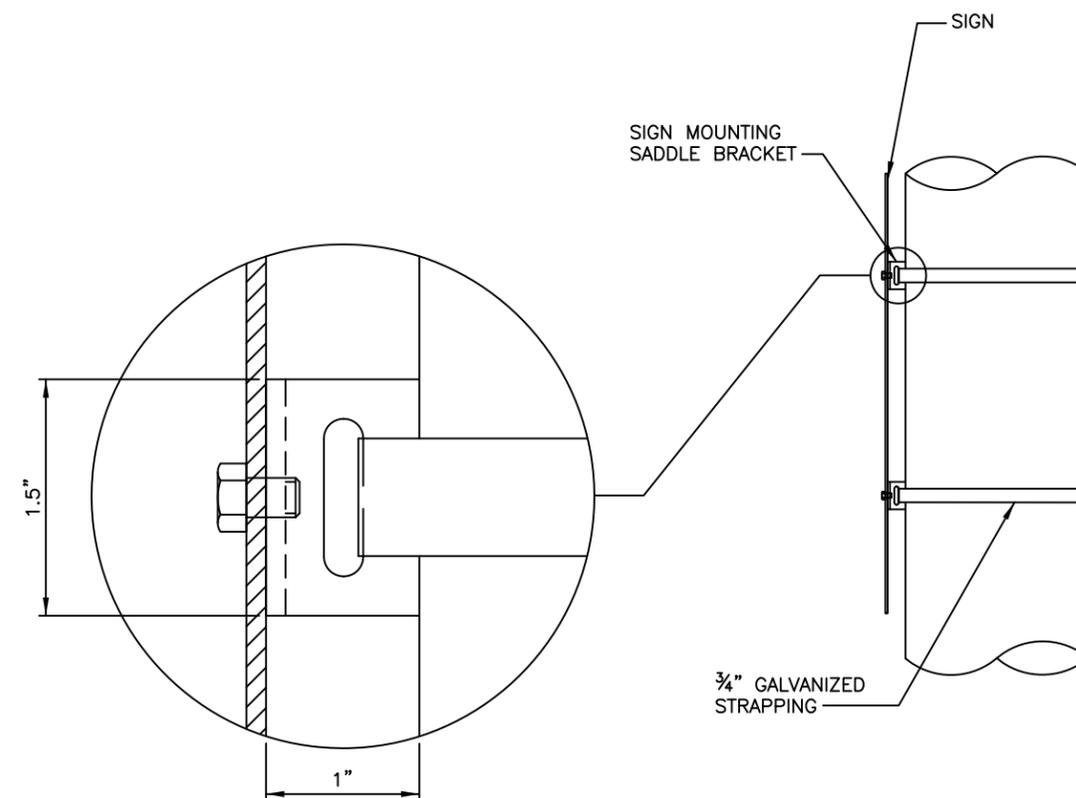
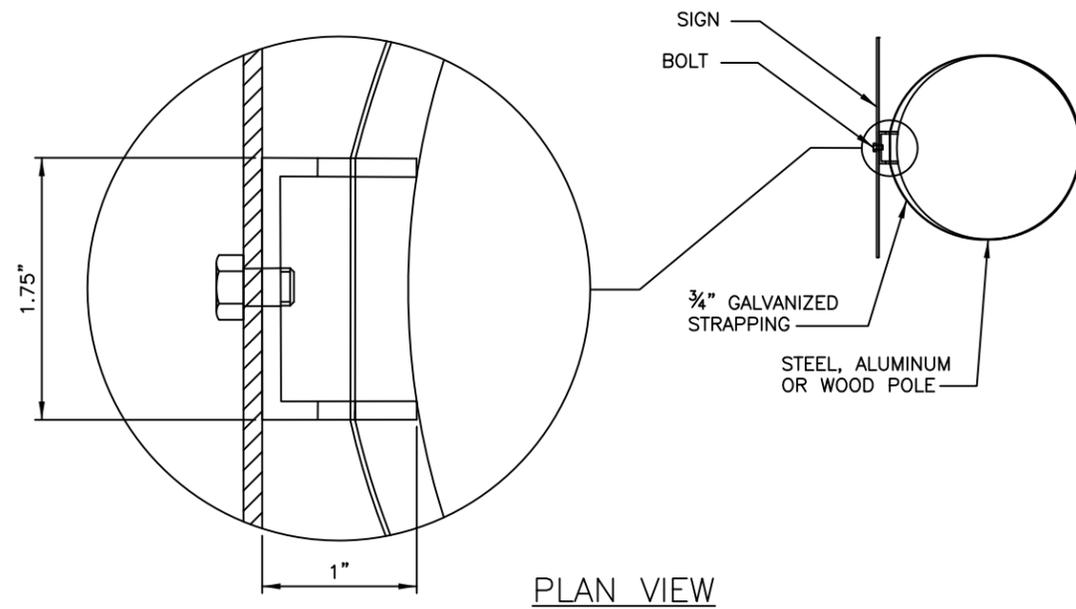
SIGN SCHEDULE



NOTES:

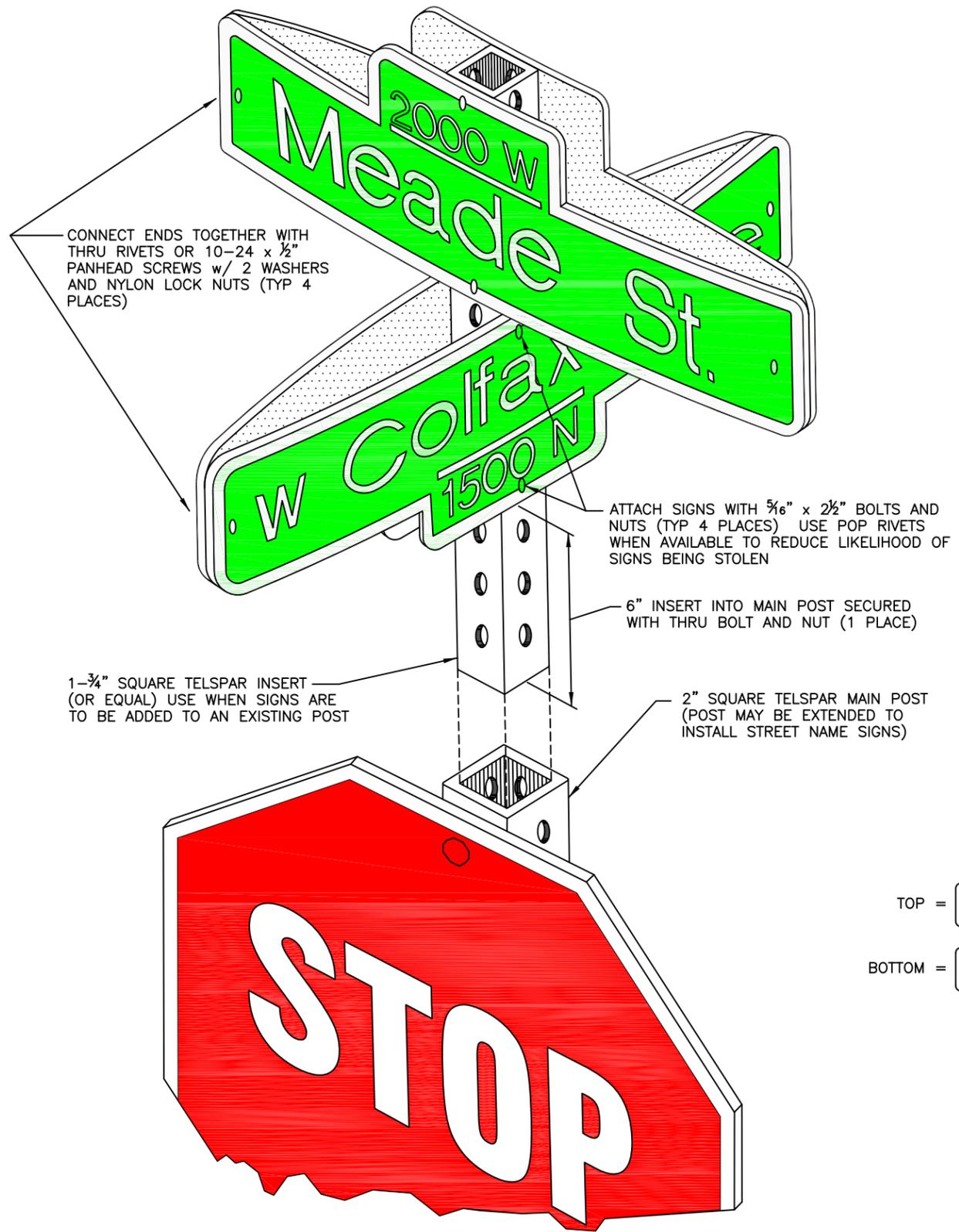
- ONE WAY AND STREET NAME SIGNS SHOULD BE INSTALLED WITH BACK TO BACK SIGN PANELS. (STOP SIGNS ARE NOT REQUIRED TO BE BACK TO BACK - SEE SHEET 16.2.12.)

CITY & COUNTY OF DENVER		 STD DWG NO 16.2.8 DATE 1/12/12
ONE-WAY SIGN PLACEMENT DETAILS		

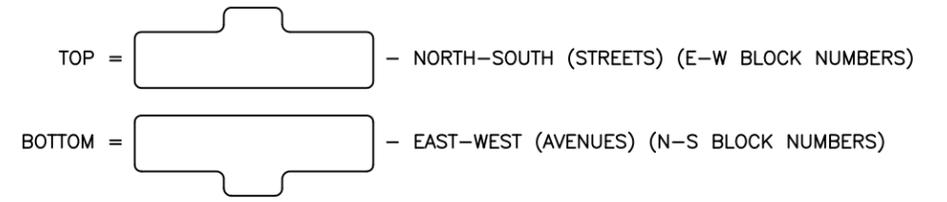


MOUNTING DETAIL FOR ADDING SIGNS TO EXISTING UTILITY POLES

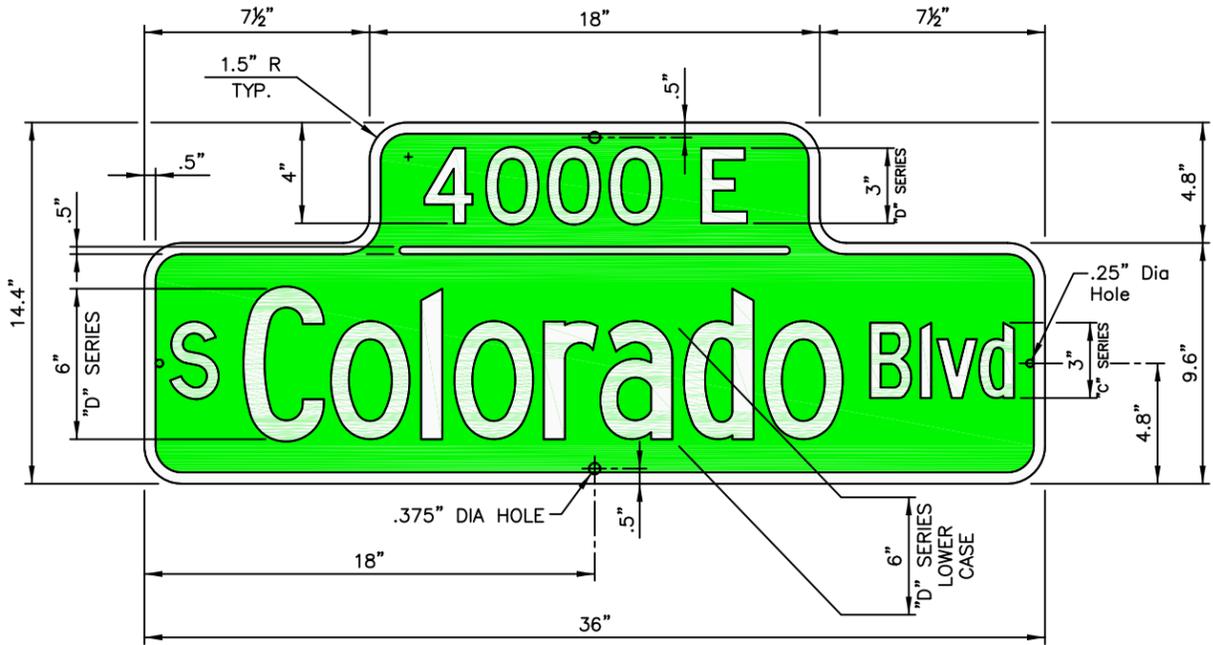
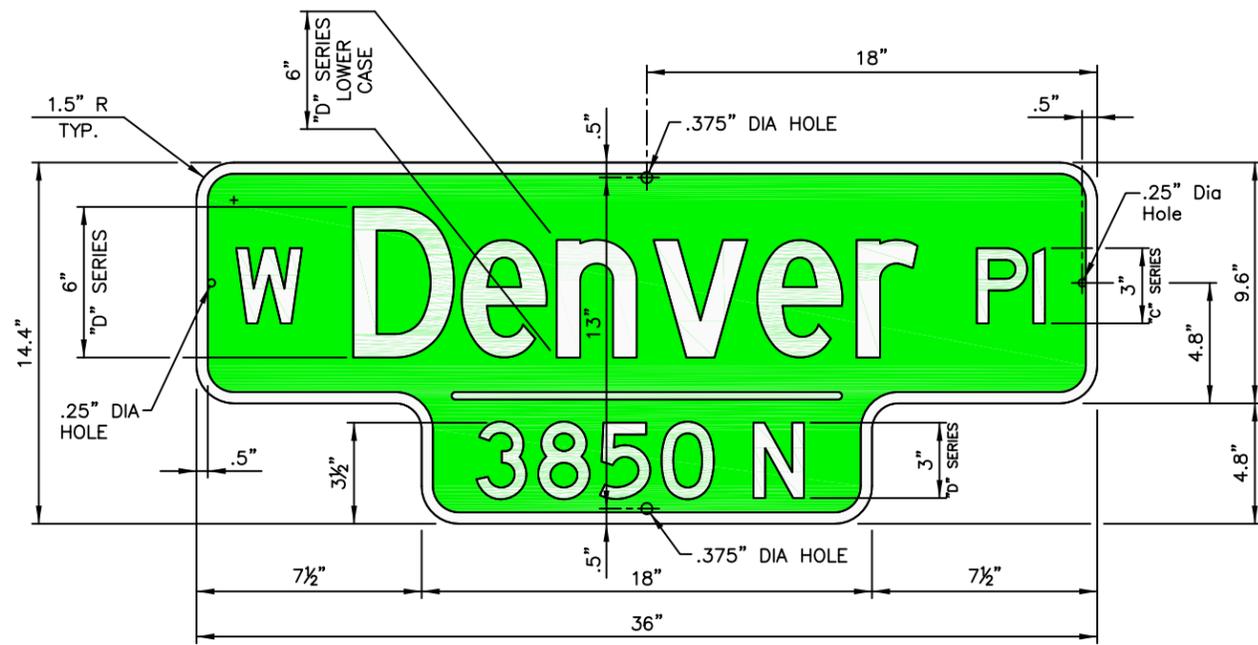
CITY & COUNTY OF DENVER		 STD DWG NO 16.2.9 DATE 1/12/12
TRAFFIC SIGN UTILITY POLE MOUNTING DETAIL		



NOTE:



CITY & COUNTY OF DENVER		 STD DWG NO 16.2.10 DATE 1/12/12
GROUND MOUNT STREET NAME SIGN INSTALLATION DETAIL		



ALL TEXT SHALL UTILIZE STANDARD HIGHWAY GOTHIC FONT OR APPROVED EQUIVALENT
 *LETTER SERIES WILL VARY DEPENDING ON NUMBER OF LETTERS IN STREET NAME (SEE EXAMPLES BELOW)
 NOTE: STROKE WIDTH OF LETTERS SHOWN ON THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY AND IS NOT INTENDED TO REPRESENT CORRECT STROKE WIDTH FOR SPECIFIED LETTER SERIES OR LETTER TO LETTER SPACING

NOTES:

1. SIGNS: ALL SIGNS SHALL BE FABRICATED FROM ASTM TYPE-XI, 4000 SERIES SIGN FACE-SHEETING MATERIAL, OR APPROVED EQUIVALENT. ALL SIGNS ARE 0.080 GAUGE, 6061-T6 OR 5052-H38 ALUMINUM ALLOY, TREATED WITH ALONDINE 1200 CONVERSION COATING, 3/8 INCH DIAMETER HOLES PUNCHED, CENTERED ON TOP AND BOTTOM, HORIZONTAL AXIS WITH STANDARD 1-1/2 INCH RADIUS CORNERS. ALL IMAGING SHALL BE ACCOMPLISHED WITH A MATCH COMPONENT SYSTEM WITH ACRYLIC FILM THAT MATCHES THE WARRANTY OF THE BASE REFLECTIVE SHEETING. INKS SHALL NOT BE PERMITTED FOR IMAGING.
2. SQUARE 12 GAUGE GALVANIZED STEEL POST WITH PRE-DRILLED 3/8" HOLES; TELSPAR OR APPROVED EQUAL.

6 OR LESS LETTERS IN STREET NAME:

6" D SERIES*



36"



7 OR 8 LETTERS IN STREET NAME:

6" C SERIES*



36"



9 OR MORE LETTERS IN STREET NAME:

6" B SERIES*



42"



NOTES:

1. ALL SIGN PLATES SHALL BE 0.08 INCH THICK ALUMINUM WITH ROUNDED CORNERS (1.25 INCH RADIUS ON OUTSIDE CORNERS, AND .875" RADIUS ON INSIDE CORNERS). SIGN PLATES ARE TO BE PRE-DRILLED WITH .375 INCH HOLES LOCATED IN THE CENTER OF THE SIGN PLATE AND .5 INCHES FROM THE TOP AND BOTTOM EDGES (MEASURED TO CENTER OF HOLE).
 2. ALL SIGN POSTS FOR INSTALLING STREET NAME SIGNS SHALL BE 2.0 INCH BY 2.0 INCH SQUARE STEEL POSTS WITH PRE-DRILLED MOUNTING HOLES.
 - 3.
 4. ALL MOUNTING BOLTS SHALL BE ZINC OR CADMIUM PLATED.
 5. ALL STREET NAME SIGNS SHALL BE MOUNTED SO AS TO HAVE 7.0 FEET MINIMUM VERTICAL CLEARANCE ABOVE SIDEWALK GRADE AND 2.0 FEET MINIMUM LATERAL CLEARANCE FROM FACE OF CURB OR EDGE OF ROADWAY.
 6. STREET NAME SIGNS MAY BE INSTALLED ABOVE EXISTING STOP SIGNS OR ONE-WAY SIGNS ON UTILITY POLE WITH THE CONDITION THAT STREET NAME SIGN MOUNTING HEIGHT DOES NOT EXCEED 12.5 FEET ABOVE GRADE.
 7. ALL SIGN FACE SHEETING MATERIAL SHALL BE REFLECTORIZED AND AFFIXED TO ONE SIDE OF SIGN BLANK ONLY. SHEETING MATERIAL SHALL COMPLY WITH F.H.W.A. STANDARDS ESTABLISHED FOR A.S.T.M. TYPE XI SHEETING, A HIGH INTENSITY SHEETING WITH ENCAPSULATED LENS (HI-INTENSITY GRADE). ALL MANUFACTURERS STANDARDS FOR SURFACE PREPARATION, SHEETING ADHESION, AND EDGE SEALING SHALL BE MET.
 8. A MINIMUM 10-YEAR MANUFACTURERS WARRANTY FOR THE RETRO-REFLECTIVITY AND PERFORMANCE OF THE SIGN FACE SHEETING MATERIALS SHALL BE PROVIDED TO THE CITY TRAFFIC ENGINEER.
 9. THE PREFIXES 'W' AND 'S' SHALL BE ADDED TO STREET NAME SIGNS AT INTERSECTIONS THAT ARE WEST OF BROADWAY AND/OR SOUTH OF ELLSWORTH AVENUE. NO PREFIXES SHALL BE USED ON STREETS THAT ARE EAST OF BROADWAY OR NORTH OF ELLSWORTH AVENUE.
 10. ON NUMBERED STREETS, THE SUFFIX FOLLOWING THE NUMBER SHALL BE LOWER CASE LETTERS.
- USE SNS-2 FOR ALL ROADWAYS WITH SPEED LIMIT 40 MPH OR LESS.

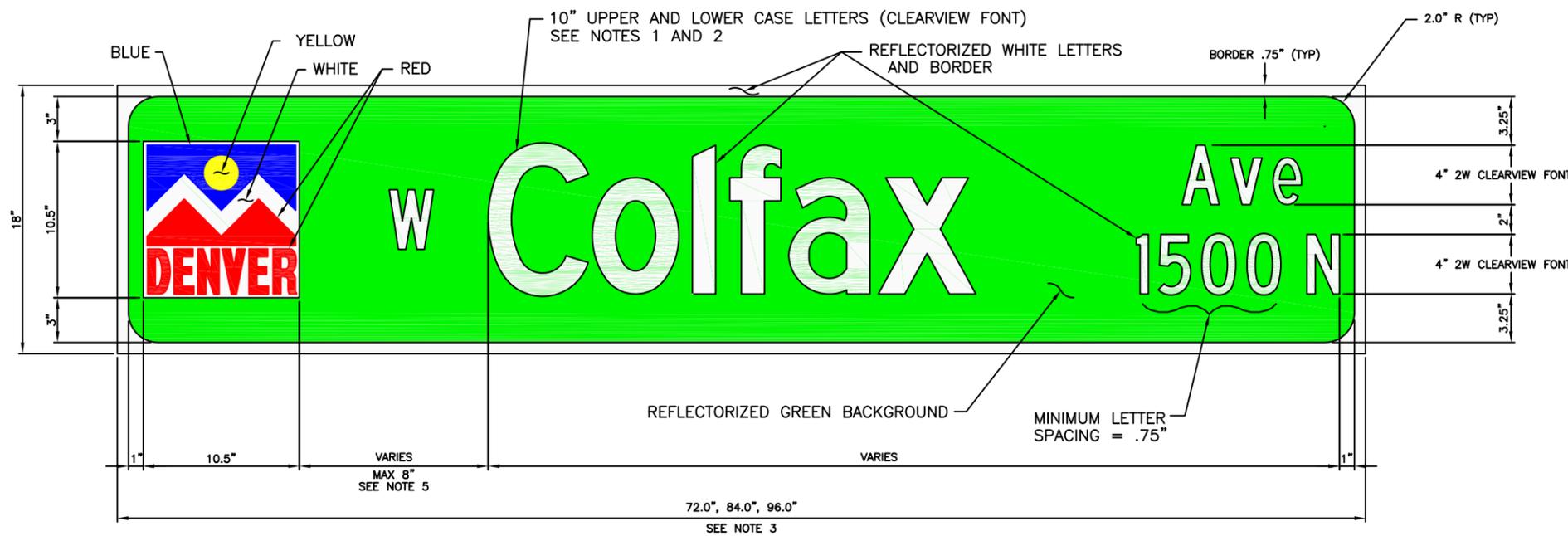
CITY & COUNTY OF DENVER

GROUND MOUNT STREET NAME SIGN DETAIL



STD DWG NO
16.2.11

DATE
1/12/12



NOTES (CONTINUED):

4. ALL OVERHEAD STREET NAME SIGNS SHALL BE FABRICATED USING WHITE RETRO-REFLECTIVE SHEETING MATERIALS AS BACKGROUND WITH LETTERS AND BORDER FORMED BY GREEN TRANSPARENT ELECTRO-CUT FILM APPLIED OVER THE BACKGROUND MATERIAL THROUGH A PRESSURE SENSITIVE ADHESION PROCESS. THE CITY OF DENVER LOGO IS TO BE MADE USING THE SAME SHEETING MATERIAL WITH BLUE, RED, AND YELLOW TRANSPARENT ELECTRO-CUT FILM. THE LOGO MAY BE FABRICATED SEPARATELY AND THEN ADDED TO THE SIGN AS AN OVERLAY USING THE SAME ADHESION PROCESS APPROVED BY THE SHEETING MATERIAL MANUFACTURER. THE SHEETING MATERIAL AND TRANSPARENT ELECTRO-CUT FILM SHALL CONFORM TO THE FOLLOWING PRODUCT SPECIFICATIONS:

A. U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, STANDARD SPECIFICATIONS FOR TYPE XI SIGN FACE SHEETING, A VERY-HIGH INTENSITY MICRO-PRISMATIC SHEETING DESIGNED TO PROVIDE REFLECTIVE HIGH SIGN FACE RETRO-REFLECTIVITY FOR OVERHEAD SIGNS THAT ARE TO BE VIEWED BY DRIVERS AT DISTANCES OF 1000 FEET OR LESS. ELECTRO-CUT FILM USED IN CONJUNCTION WITH THE TYPE XI SHEETING MATERIAL SHALL BE ELECTRO-CUT FILM #1177C OR AN EQUIVALENT APPROVED BY THE ENGINEER.

B. THE ASTM TYPE XI SHEETING MATERIAL AND TRANSPARENT ELECTRO-CUT FILM USED SHALL INCLUDE A WARRANTY WHICH GUARANTEES AN EFFECTIVE FIELD PERFORMANCE LIFE OF AT LEAST 12 YEARS.

NOTES:

1. STREET NAMES WITH 4 CHARACTERS OR LESS: USE FHWA STANDARD CLEARVIEW "3B" SERIES FONT.
2. STREET NAMES WITH MORE THAN 4 CHARACTERS: USE FHWA STANDARD CLEARVIEW "2W" SERIES FONT.
3. PLATE LENGTH MAY BE EXTENDED AS NECESSARY FOR LONGER STREET NAMES (MAXIMUM LENGTH 108").

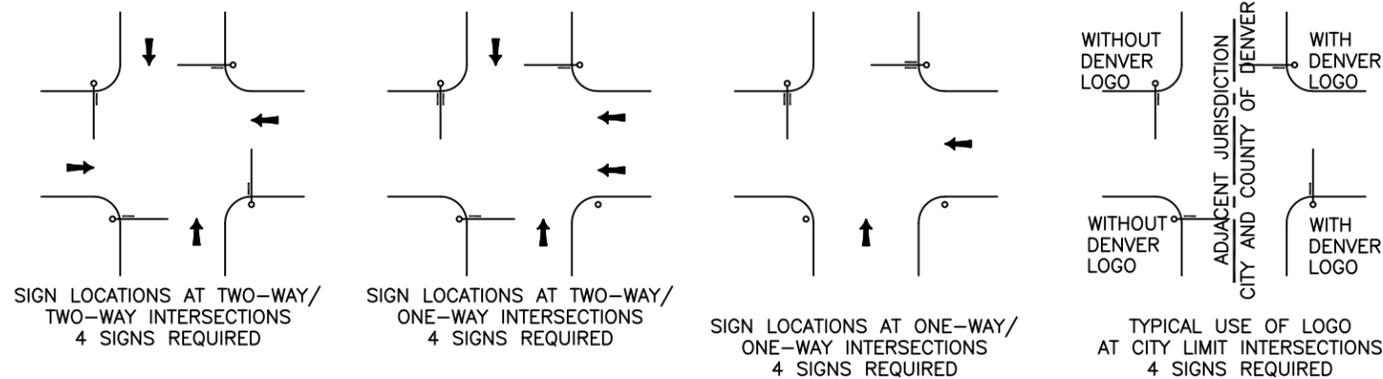
5. THE PREFIX W (FOR STREETS WEST OF BROADWAY) AND S (FOR STREETS SOUTH OF ELLSWORTH AVENUE) SHALL BE USED ON ALL STREET NAME SIGNS. NO PREFIX DESIGNATION SHALL BE USED FOR STREET NAME SIGNS NORTH OF ELLSWORTH AVENUE OR FOR STREET NAME SIGNS EAST OF BROADWAY. THE PREFIX SHALL BE CENTERED BETWEEN THE CITY FLAG AND THE STREET NAME.

6. STREET NAME SIGNS TO BE BOLTED ON TELSPAR EXTENSION WHICH CONNECTS TO MAST ARM BY USE OF ADAPTER SCREWED INTO COUPLING. SIGN SHALL BE INSTALLED LEVEL TO THE GROUND. SIGN SHALL BE FREE OF ANY HORIZONTAL OR VERTICAL DEFORMATION OR DISTORTIONS.

7. ALL STREET NAME SIGNS SHALL USE THE DENVER LOGO EXCEPT AS SHOWN BELOW AT TYPICAL CITY LIMIT INTERSECTIONS OR AS APPROVED BY T.E.S.

8. ALL MOUNTING BOLTS FOR STREET NAME SIGNS SHALL BE ZINC OR CADMIUM PLATED.

TYPICAL STREET NAME SIGN PLACEMENT LOCATIONS



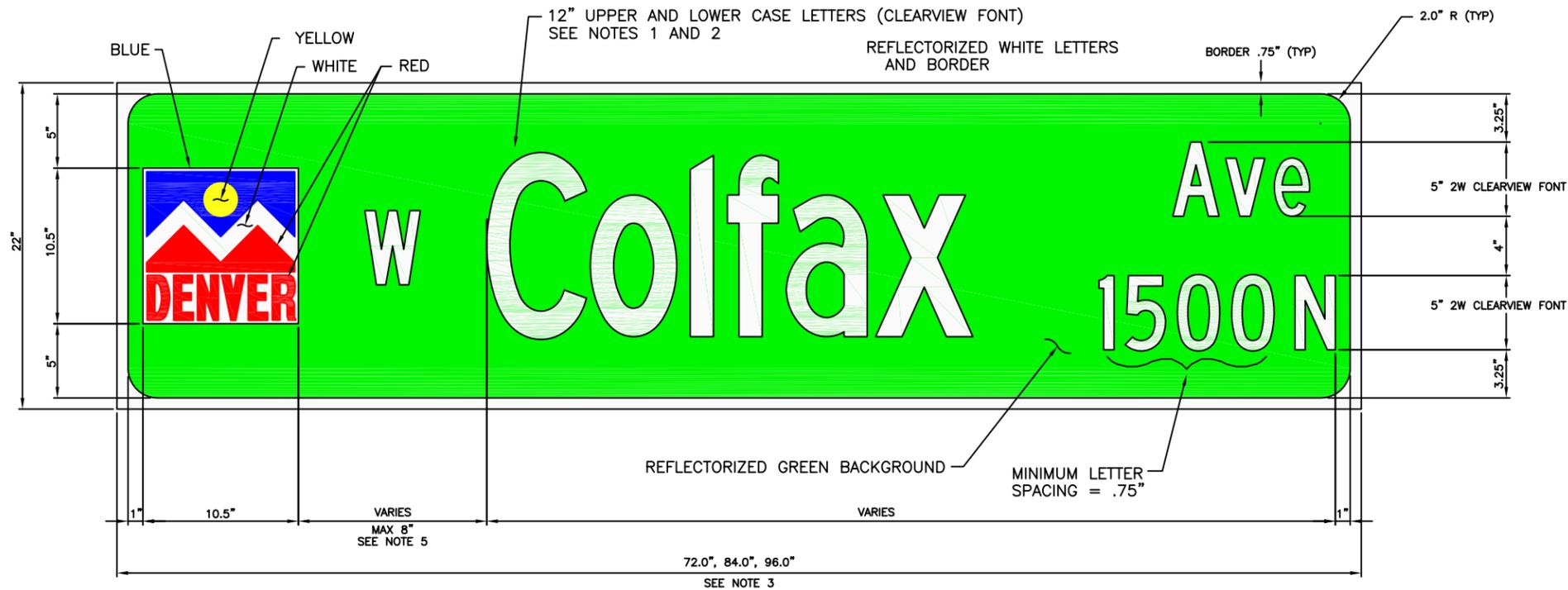
CITY & COUNTY OF DENVER

OVERHEAD STREET NAME SIGNS
(INSTALLED PRIOR TO APRIL, 2011)



STD DWG NO
16.2.12

DATE
1/12/12



NOTES (CONTINUED):

4. ALL OVERHEAD STREET NAME SIGNS SHALL BE FABRICATED USING WHITE RETRO-REFLECTIVE SHEETING MATERIALS AS BACKGROUND WITH LETTERS AND BORDER FORMED BY GREEN TRANSPARENT ELECTRO-CUT FILM APPLIED OVER THE BACKGROUND MATERIAL THROUGH A PRESSURE SENSITIVE ADHESION PROCESS. THE CITY OF DENVER LOGO IS TO BE MADE USING THE SAME SHEETING MATERIAL WITH BLUE, RED, AND YELLOW TRANSPARENT ELECTRO-CUT FILM. THE LOGO MAY BE FABRICATED SEPARATELY AND THEN ADDED TO THE SIGN AS AN OVERLAY USING THE SAME ADHESION PROCESS APPROVED BY THE SHEETING MATERIAL MANUFACTURER. THE SHEETING MATERIAL AND TRANSPARENT ELECTRO-CUT FILM SHALL CONFORM TO THE FOLLOWING PRODUCT SPECIFICATIONS:

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B. THE ASTM TYPE XI SHEETING MATERIAL AND TRANSPARENT ELECTRO-CUT FILM USED SHALL INCLUDE A WARRANTY WHICH GUARANTEES AN EFFECTIVE FIELD PERFORMANCE LIFE OF AT LEAST 12 YEARS.

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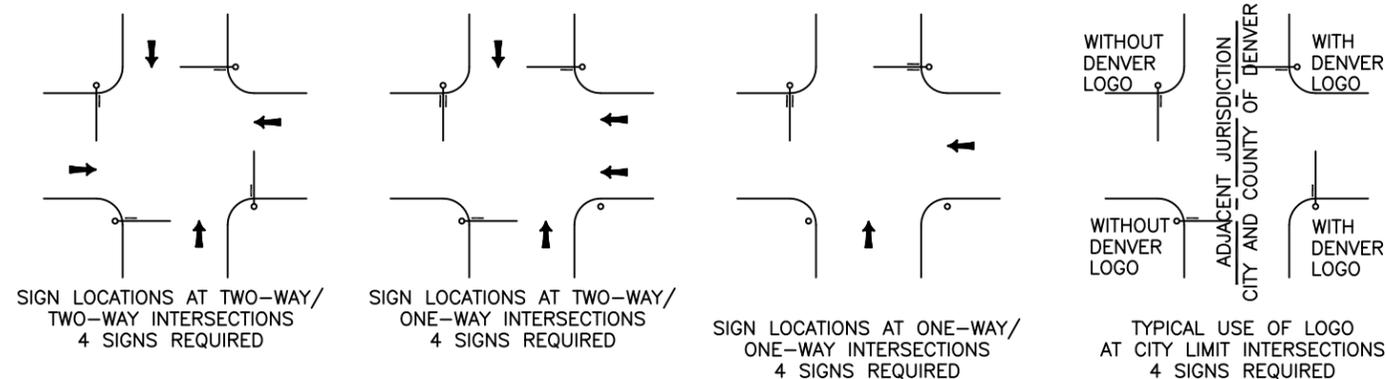
7. ALL STREET NAME SIGNS SHALL USE THE DENVER LOGO EXCEPT AS SHOWN BELOW AT TYPICAL CITY LIMIT INTERSECTIONS OR AS APPROVED BY T.E.S.

8. ALL MOUNTING BOLTS FOR STREET NAME SIGNS SHALL BE ZINC OR CADMIUM PLATED.

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TYPICAL STREET NAME SIGN PLACEMENT LOCATIONS



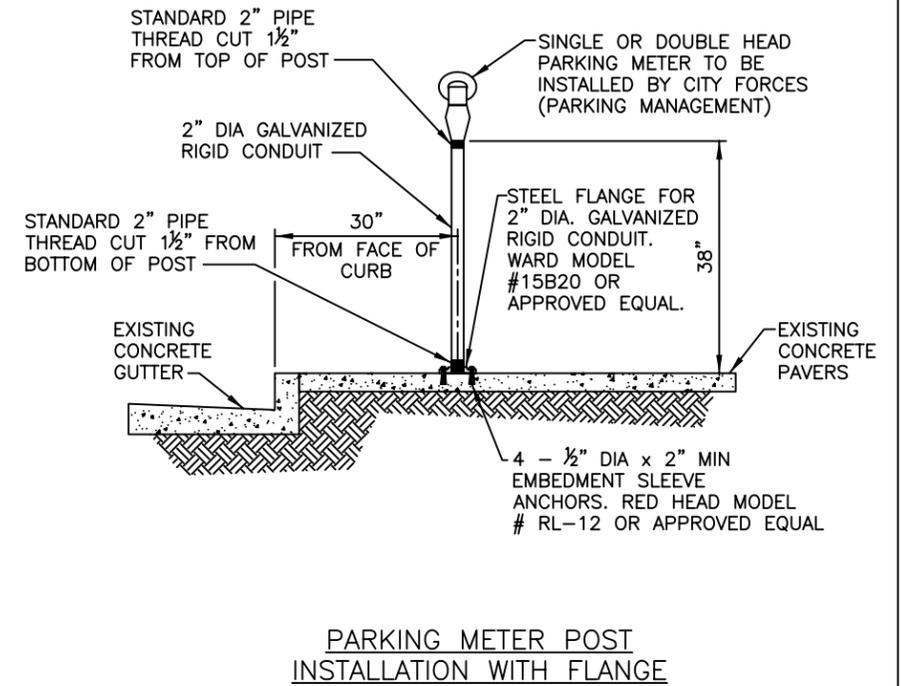
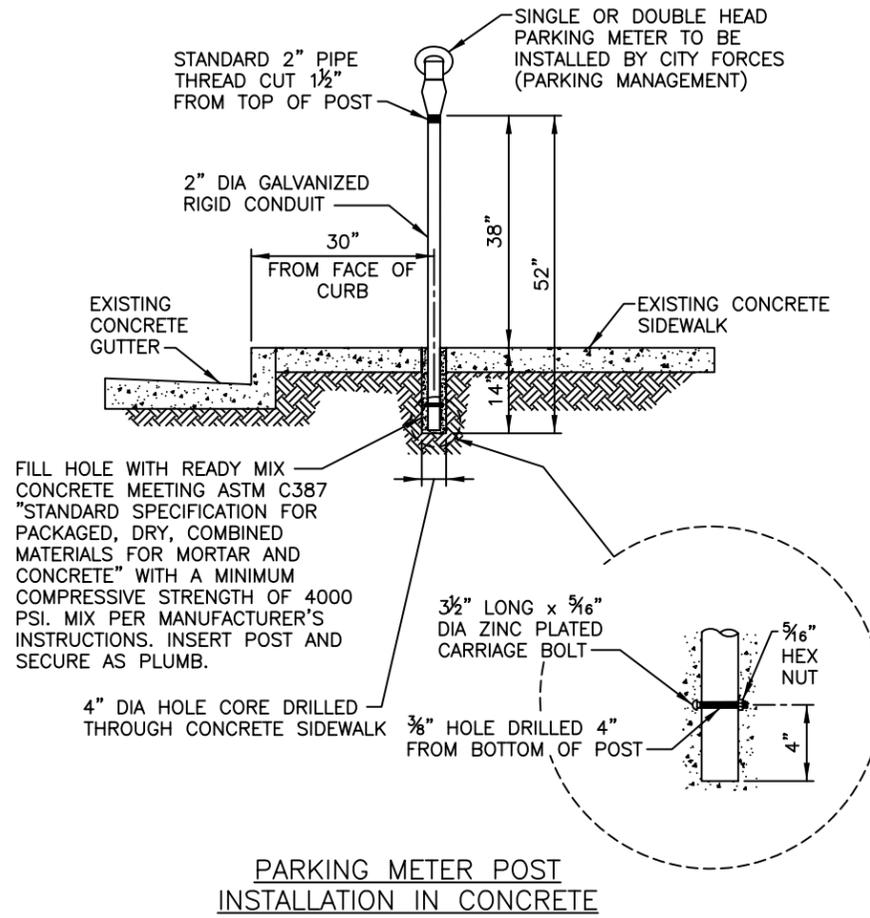
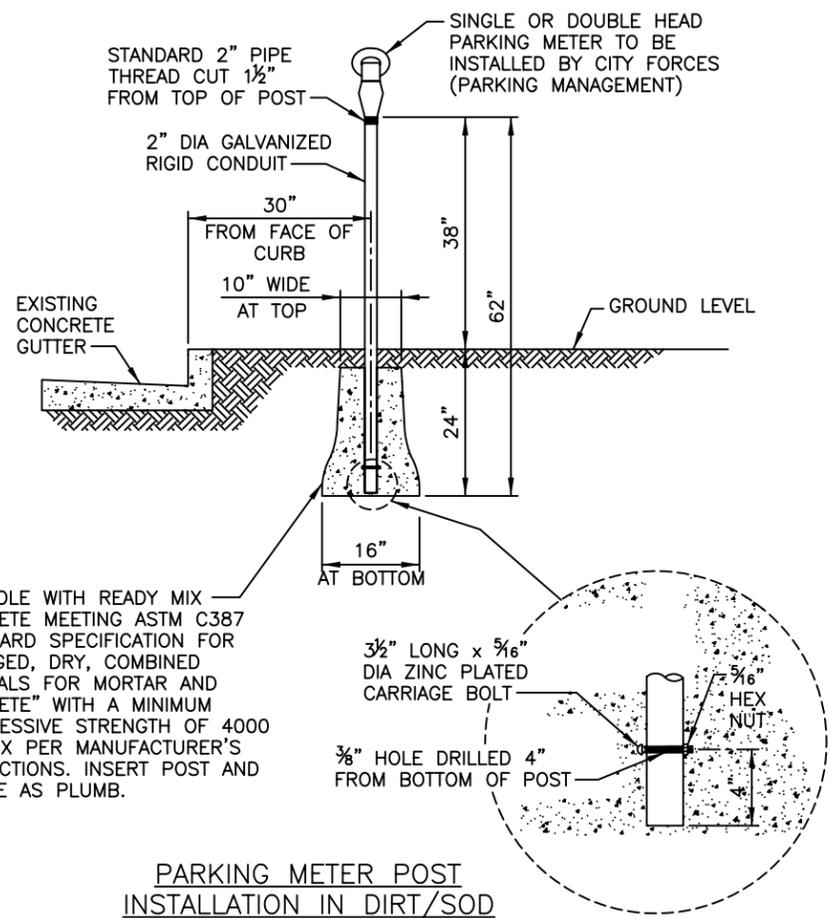
CITY & COUNTY OF DENVER

OVERHEAD STREET NAME SIGNS
(INSTALLED AFTER APRIL, 2011)

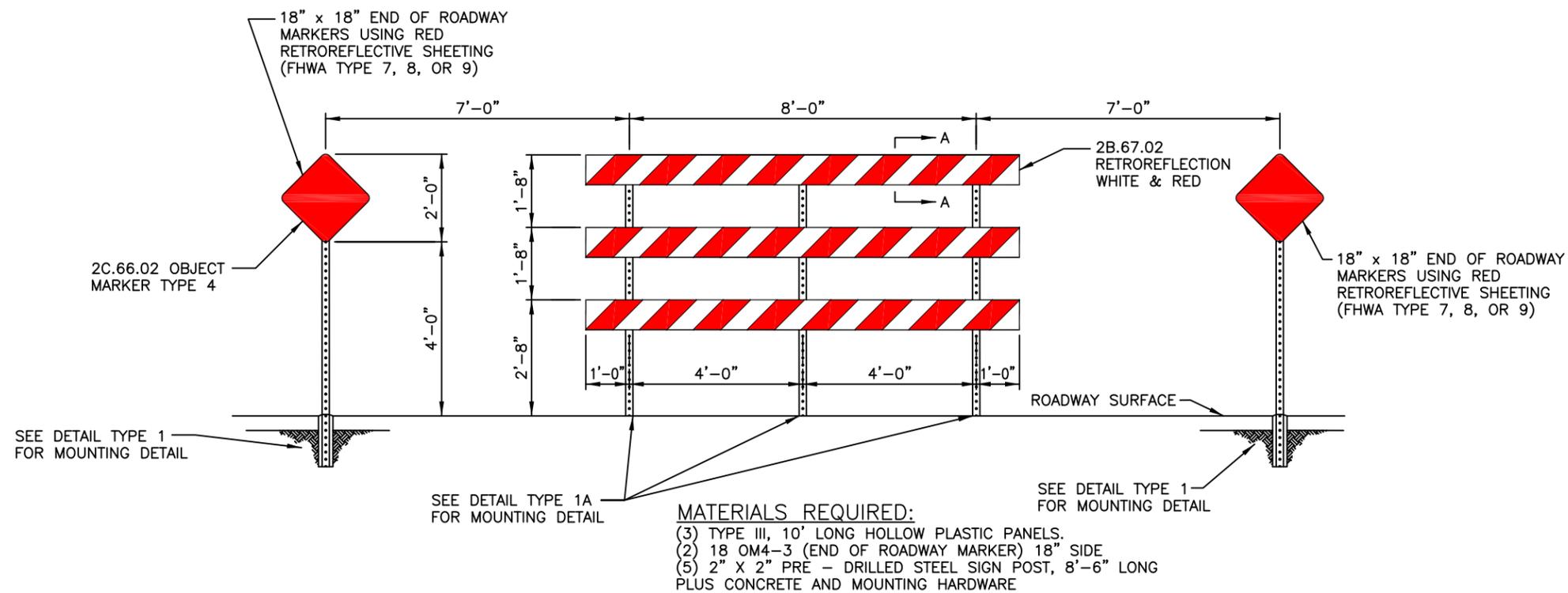


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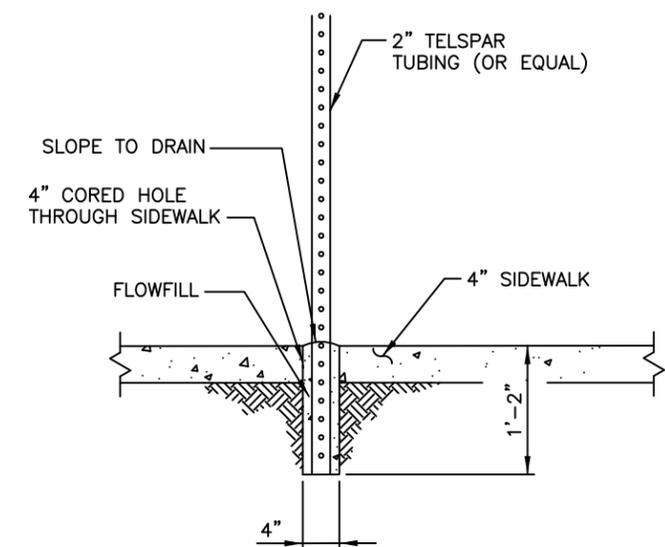
DATE
1/12/12



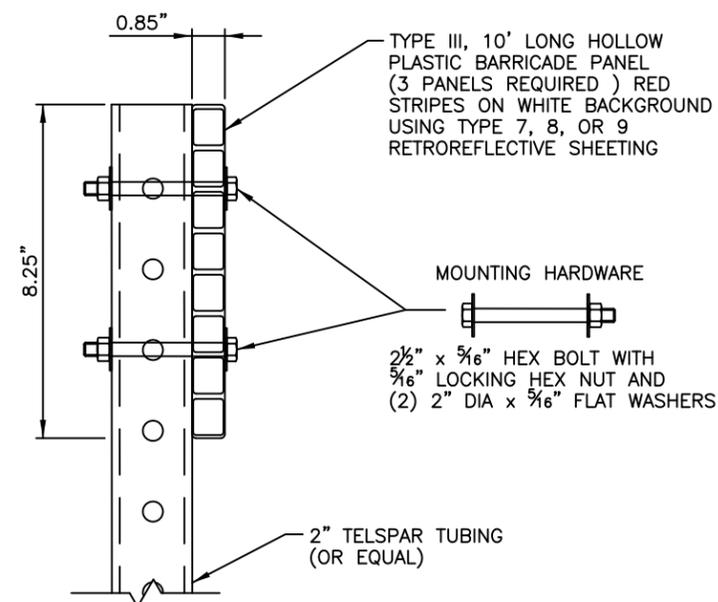
CITY & COUNTY OF DENVER		 STD DWG NO 16.2.14 DATE 1/12/12
PARKING METER POST INSTALLATION		



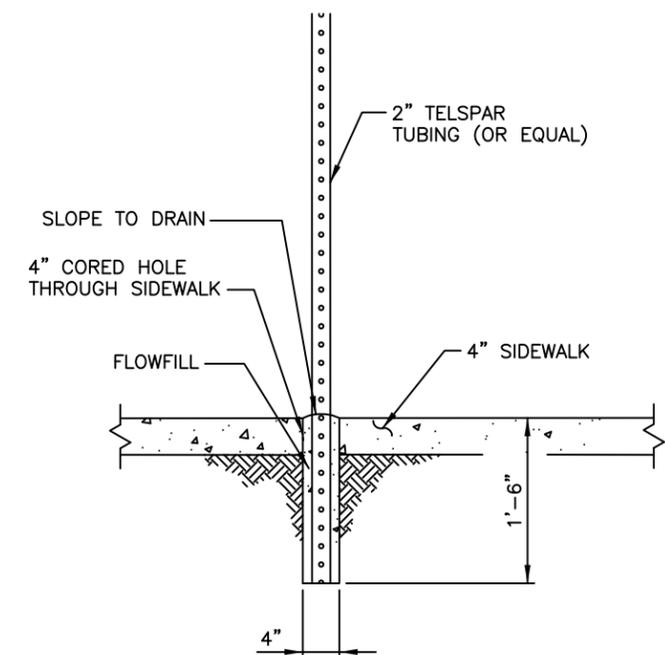
ELEVATION - END OF ROADWAY BARRICADE DETAIL



DETAIL - TYPE 1



SECTION A



DETAIL - TYPE 1A

CITY & COUNTY OF DENVER

BARRICADE DETAILS



STD DWG NO
16.2.15

DATE
1/12/12