

**GENERAL NOTES:**

**ALL WORK WILL BE DONE IN ACCORDANCE WITH:**

- A. Contractor shall have a copy of current City of Colorado Springs Traffic Signal Installation and Parts Specification on job site at all times. [The current version as of the date of this plan set is 08/10/2022.]
- B. All work shall be done in accordance with current City of Colorado Springs Engineering Division Standard Specifications, Colorado Springs City Traffic Signal Installation and Parts Specification, City of Colorado Springs Traffic Controls for Street Construction, Utility Work, and Maintenance Operations for Contractors, and Manual on Uniform Traffic Control Devices for Streets and Highway.
- C. All materials and workmanship shall be subject to inspection and approval by City of Colorado Springs Engineering representative or City Traffic Engineer.
- D. Refer to the "Grounding Methods" section 18 of this manual for information on how to ground traffic signal systems.
- E. All materials and workmanship shall be subject to inspection and approval by City of Colorado Springs Engineering representative or City Traffic Engineer.
- F. The Contractor shall contact the Utility Notification Center of Colorado at 811 three business days in advance of any excavating or grading.
- G. The Contractor shall protect and maintain utilities and structures affected by work and any damage shall be repaired and restored to the satisfaction of the City of Colorado Springs. Contractor shall coordinate with project manager or designee to resolve conflicts.
- H. Contractor shall limit construction activities to those areas within the existing right-of-way and temporary and permanent easements shown on the plans.
- I. The Contractor shall preserve all monuments, benchmarks, range ties, and property markers. The contractor shall be responsible for resetting all disturbed survey markers, including monuments, section corners, aliquot corners markers, etc.
- J. The Contractor shall be responsible for maintenance of public right-of-way, including vehicle traveled way and pedestrian paths, within the project limits at all times until acceptance by the City.
- K. Installation and maintenance of all traffic devices is the responsibility of the contractor.
- L. Construction activity shall be scheduled with the minimum impact to pedestrian and vehicle traffic.
- M. The Contractor shall be responsible for maintenance of traffic signalization at existing signalized intersection shown on the signal plans at all times from beginning of the project to acceptance approved by the City. All changes to the physical layout of traffic signal or signal timing shall be approved by the City before implantation.
- N. Contractor shall contact the City Traffic Engineering representative for inspection of pole caisson from, anchor bolts and conduit stub out 24 hours prior to intent of prior to intent of pour, and (2-hour minimum conformation) prior to pouring concrete.
- O. Conditional Acceptance: Once construction of a traffic signal has been satisfactorily completed, the signals are "conditionally accepted" by owner. At this time the signal is turned on and the "burn-in" period begins. The burn-in period will last 15 days. During the burn-in period the signal system is allowed to operate under real world conditions. Any malfunction accruing during this period will require a repair or replacement and if the malfunction is serious enough, the burn-in period must be restarted.
- P. Final Acceptance: After the burn-in period is completed, all punch list items have been corrected and the contractor has met all contract requirements (such as final cleanup of work site, as built drawings and bore logs), the signal will be accepted. The Contractor shall provide a two-year guarantee on all work performed under this contract after the job has been completed and accepted.
- Q. The contractor shall provide a two-year guarantee on all work performed under this contract after the job has been completed and accepted.
- R. The contractor shall provide engineer with daily quantities and traffic control diaries at the end of each work week or as directed by the engineer.
- S. The contractor shall submit "As-Built" or corrected plans showing, in detail, all construction changes including but not limited to bore logs, pothole logs, wiring, cable, poles, controller cabinet, detection system and location of all conduits within 7 days of installation.
- T. All traffic signal equipment that is removed shall remain the property of the City of Colorado Springs. Such property is to be returned by contractor to 416 W. Fontanero St, City Traffic Signal Construction Shop. Contractor must contact Traffic Signals (719) 385-6747 to coordinate delivery. All traffic signal equipment shall be returned, in the same operating condition when removed. Poles will be stripped clean of all attached parts before delivery.
- U. Contractor shall replace or reconstruct sidewalks, curbs, gutters, pavement, and any other improvements removed, broken or damaged by contractor that were not designated for removal in the project. Must meet City Engineering Specifications and inspections practices.
- V. Signal heads shall not be installed if a long delay is expected for turning signal active. During any period which signal head or heads are not active shall be bagged with traffic signal head covers & marked with legible "out of service" markings.
- W. Acceptable times for turning new or rebuilt intersection operational is between 9:00 AM Monday through 3:00 PM Thursday.
- X. Contractor shall protect all known environmental resources in the city right-of-way. Erosion and sediment control shall be in place when need identified on project.

The signal system shall be installed per the specifications within the following sections of:

COLORADO SPRINGS CITY TRAFFIC SIGNAL INSTALLATION & PARTS SPECIFICATIONS, as applicable to this design.

1. CONTRACTOR PRE-QUALIFICATION
3. MATERIALS
4. CABLE SPLICING AND COLOR CODES
6. CONDUIT, JUNCTION BOXES, & CONTROLLER BASE
8. SIGNAL POLE 2015 AASHTO DESIGN (Specifications for mast arm type signals apply)
9. SIGNAL POLE FOUNDATION 2015 AASHTO DESIGN (Specifications for mast arm type signals apply)
11. SIGNAL HEADS AND MOUNTING EQUIPMENT (Specifications for mast arm type signals apply)
12. PEDESTAL POLES AND PEDESTRIAN BUTTONS
13. SIGNAL CABINET 332CS AND 330S
14. VEHICLE DETECTION SYSTEMS
15. SERVICE AND WIRE SPECIFICATIONS
17. LED ROADWAY LIGHTING
18. GROUNDING METHODS

APPENDIX A - Concrete Mix Designs and Requirements

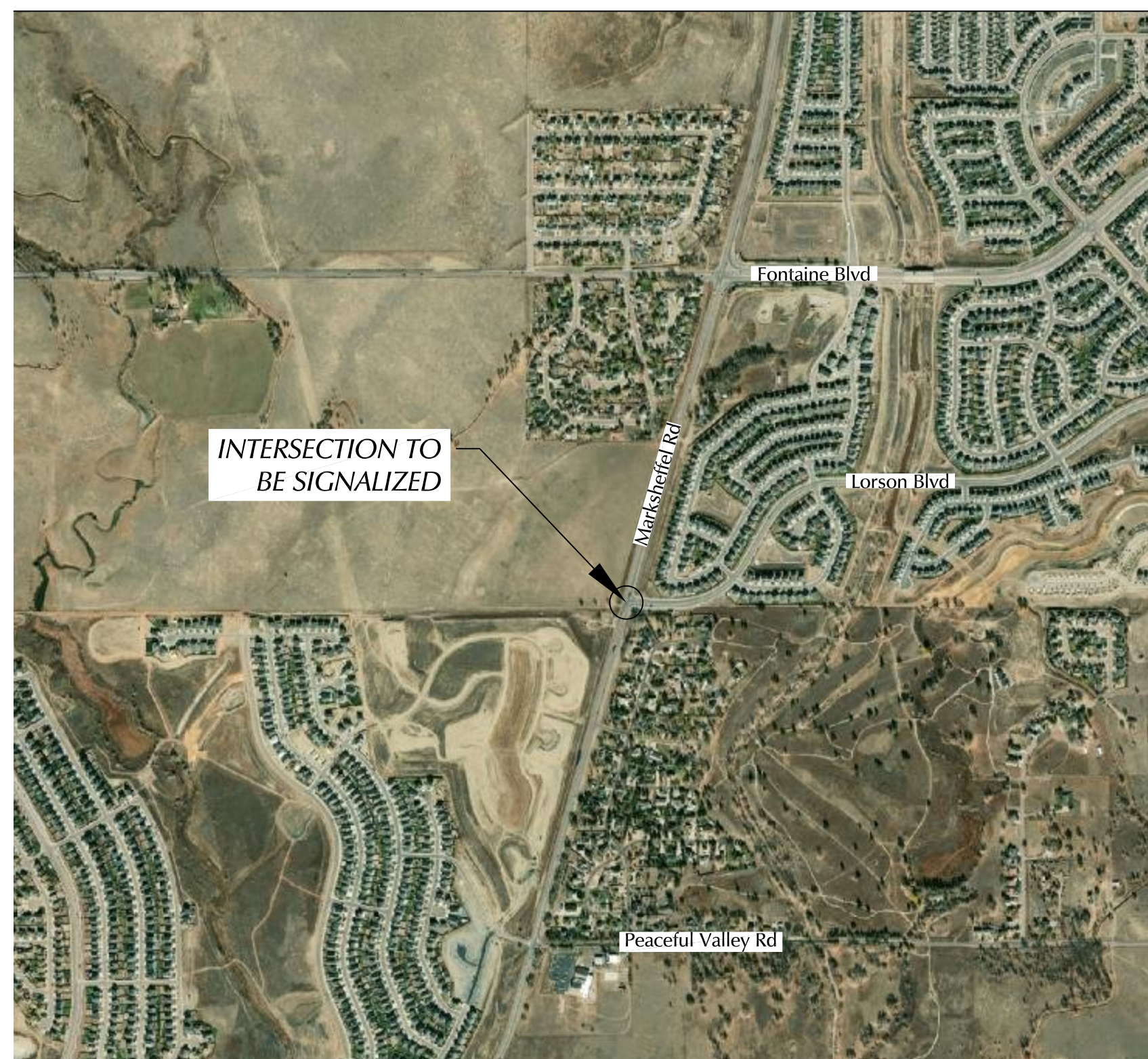
Other sections may apply as well.

**FOUNDATION DESIGN AND CONSTRUCTION NOTES**

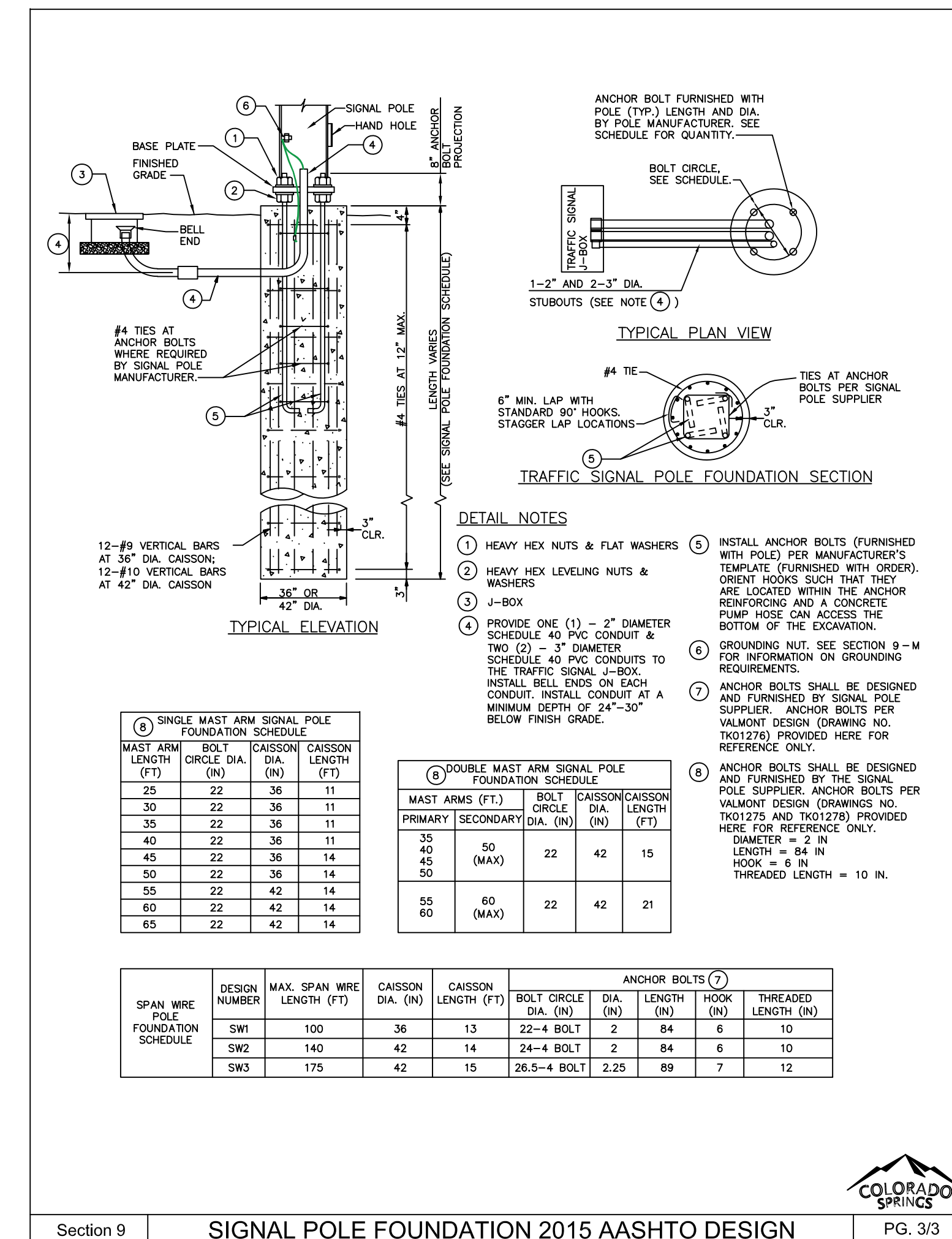
1. THE STANDARD SIGNAL FOUNDATIONS SHOWN ON THIS DRAWING SHALL ONLY BE USED WITH THE CITY OF COLORADO SPRINGS STANDARD SIGNAL PLANS, AS DEVELOPED BY VALMONT INDUSTRIES.
  2. ALL WORK SHALL BE IN ACCORDANCE WITH THE COLORADO SPRINGS CITY TRAFFIC SIGNAL INSTALLATION AND PARTS SPECIFICATIONS.
  3. ALL CAISSON CONCRETE SHALL BE CDOT CLASS BZ, f'c = 4,000 psi
  4. ALL REINFORCING STEEL SHALL BE GRADE 60, fy = 60,000 psi
  5. ANCHOR BOLTS SHALL BE ASTM F1554 GRADE 55. ANCHOR BOLTS SHALL BE FURNISHED BY SIGNAL POLE MANUFACTURER.
  6. THE SIGNAL FOUNDATION DESIGN SHOWN ON THIS DRAWING IS PER THE AASHTO 2015 LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, INCLUDING 2017, 2018, AND 2019 INTERIM REVISIONS AND ASSUMES THE MINIMUM SOIL CHARACTERISTICS AS WOULD BE TYPICALLY ENCOUNTERED IN COLORADO SPRINGS WHICH ARE NOTED BELOW. IN THE EVENT THAT SOFT SOIL CONDITIONS (A BLOW COUNT OF N<8) ARE ENCOUNTERED, A SITE SPECIFIC GEOTECHNICAL EVALUATION AND FOUNDATION DESIGN WILL BE NECESSARY.
- ASSUMED GEOTECHNICAL DESIGN PARAMETERS:
- SOIL DENSITY (-g) = 120 pcf  
 SOIL COHESION = 750 psf  
 ANGLE OF INTERNAL FRICTION (φ) = 26°  
 HORIZONTAL MODULUS OF SUBGRADE REACTION (K) = 77 Tcf  
 E<sub>so</sub> = 0.01 in/in
7. IF THE FOLLOWING SITUATIONS ARE ENCOUNTERED DURING CONSTRUCTION, CONTACT THE CITY OF COLORADO SPRINGS ENGINEER.
    - (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.
  8. ADHERE TO THE FOLLOWING DURING CONSTRUCTION.
    - (A) PRIOR TO POURING CONCRETE, ANCHOR BOLT THREADS SHALL BE OILED. BOLT POSITIONS SHALL BE ACCURATE TO 1/8". BOLTS SHALL BE ACCURATELY SQUARE WITH CURB LINE.
    - (B) PRIOR TO POURING CONCRETE, CONDUITS SHALL BE TAPED. CONDUIT DIRECTIONS ARE TO BE DETERMINED BY THE TRAFFIC ENGINEER OR FIELD REPRESENTATIVE. MARK ALL CONDUIT RUNS ON TOP OF THE CONCRETE BASE. MARKS SHOULD BE 2" FROM THE PERIMETER OF THE BASE.
    - (C) CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH.
    - (D) CONCRETE SHALL BE VIBRATED.
    - (E) A MINIMUM OF 3" CONCRETE COVER SHALL BE MAINTAINED AROUND THE STEEL CAGE. A MAXIMUM OF 4" OF COVER IS ALLOWED AT THE TOP OF THE CAGE.
    - (F) ALL CONDUIT STUBS SHALL EXTEND FREELY BEYOND THE POUR AND SHALL BE FITTED WITH A COUPLING ON EACH STUB. STUBS SHALL BE TAPED TO PREVENT ENTRY OF DIRT OR CONCRETE.
    - (G) LOOSE DIRT SHALL BE REMOVED FROM THE BOTTOM OF THE HOLE PRIOR TO POURING CONCRETE.
    - (H) TRASH SHALL NOT BE THROWN INTO THE HOLE.
    - (I) THE BASE SURFACE SHALL BE SMOOTH FINISHED WITH A STEEL TROWEL AND HAVE A LIGHT BROOM FINISH.
    - (J) THE BASE TOP SHALL BE FLUSH TO SIDEWALK GRADE OR, IF NOT ATTACHED TO SIDEWALK, 1" ABOVE GRADE.
    - (K) NO COLD JOINTS ARE ALLOWED IN CAISSONS. POUR CAISSONS CONTINUOUSLY TO FINISHED GRADE.
    - (L) POLE FOUNDATION MAY VARY IN DEPTH AND/OR DIAMETER, AS APPROVED BY THE CITY'S TRAFFIC ENGINEER. THE CITY SHALL APPROVE MODIFICATIONS NEEDED FOR THE CAISSONS DUE TO UNFORESEEN CONDITIONS.
    - (M) BASE DIMENSIONS AND BOLT CIRCLE PATTERN MAY VARY FROM THE STANDARD, BUT ONLY UPON APPROVAL BY THE CITY TRAFFIC ENGINEER.



Section 9 SIGNAL POLE FOUNDATION 2015 AASHTO DESIGN PG. 2/3



**VICINITY**



**Sheet Index:**

- Sheet 1: Vicinity Map, General Notes, City-Standard Caisson Design
- Sheet 2: New Mast-Arm Traffic Control Signal Plan
- Sheet 3: Future West Leg and Utilities/ Civil Base Infrastructure (for reference only)

Design Engineer's Signature & Stamp:

Jeffrey C. Hodson, P.E. #31684

Date: \_\_\_\_\_

**CITY OF COLORADO SPRINGS**

REVIEWED \_\_\_\_\_ DATE \_\_\_\_\_

CITY TRAFFIC ENGINEER \_\_\_\_\_

**NEW TRAFFIC CONTROL SIGNAL PLAN**  
 Vicinity Map, General Notes, Sheet Index  
 Marksheffel Road. & Lorson Boulevard



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Prepared By: JEFFREY C. HODSDON, P.E.

REVISIONS	DATE
City & County Comments	6/30/23
Colorado Springs Comments	5/16/23

DATE: 4/17/2023  
 SCALE: Vicinity - NTS  
 DRAWN BY: MW  
 JOB NO.: S224170  
 DWG: S224170 Signal Plan She

SHT NO. : 1  
 OF 3

STREET NAME SIGNS

H **Marksheffel Rd**

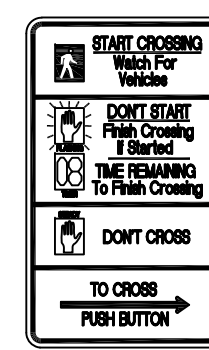
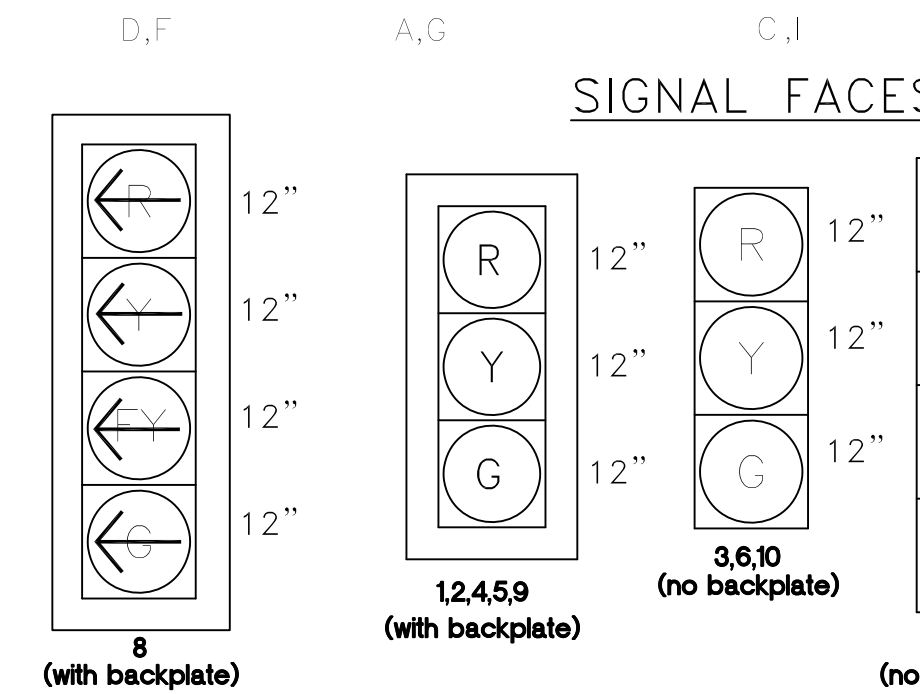
B, E **Lorson Blvd**

D3-1 with 12' letters

LEGEND

ITEM	NEW
TRAFFIC SIGNAL HEAD (NO BACKPLATE)	
TRAFFIC SIGNAL HEAD WITH BACKPLATE	
SIGNAL POLE w/ MAST ARM & FOUNDATION	
PEDESTAL POST	
ELECTRICAL CONDUIT RUN	
POWER METER	
PULL BOX	
LUMINAIRE w/ MAST ARM	
CONTROLLER CABINET	
SIGN, SIGNAL-POLE-MOUNTED	
VIDEO DETECTOR CAMERA	

SIGNS



R10-3e (4 each)  
(For use at pedestrian push buttons)

KEY

- PROTECTED
- PERMISSIVE
- PEDESTRIAN

SIGNAL PHASING

PHASE 1	PHASE 2	PHASE 3	PHASE 4
			Not Used
Not Used		Not Used	
PHASE 5	PHASE 6	PHASE 7	PHASE 8

Move northwest corner pole next to the right of way fence.  
Water & Gas line running north/south needs clearance.

MATERIALS LIST

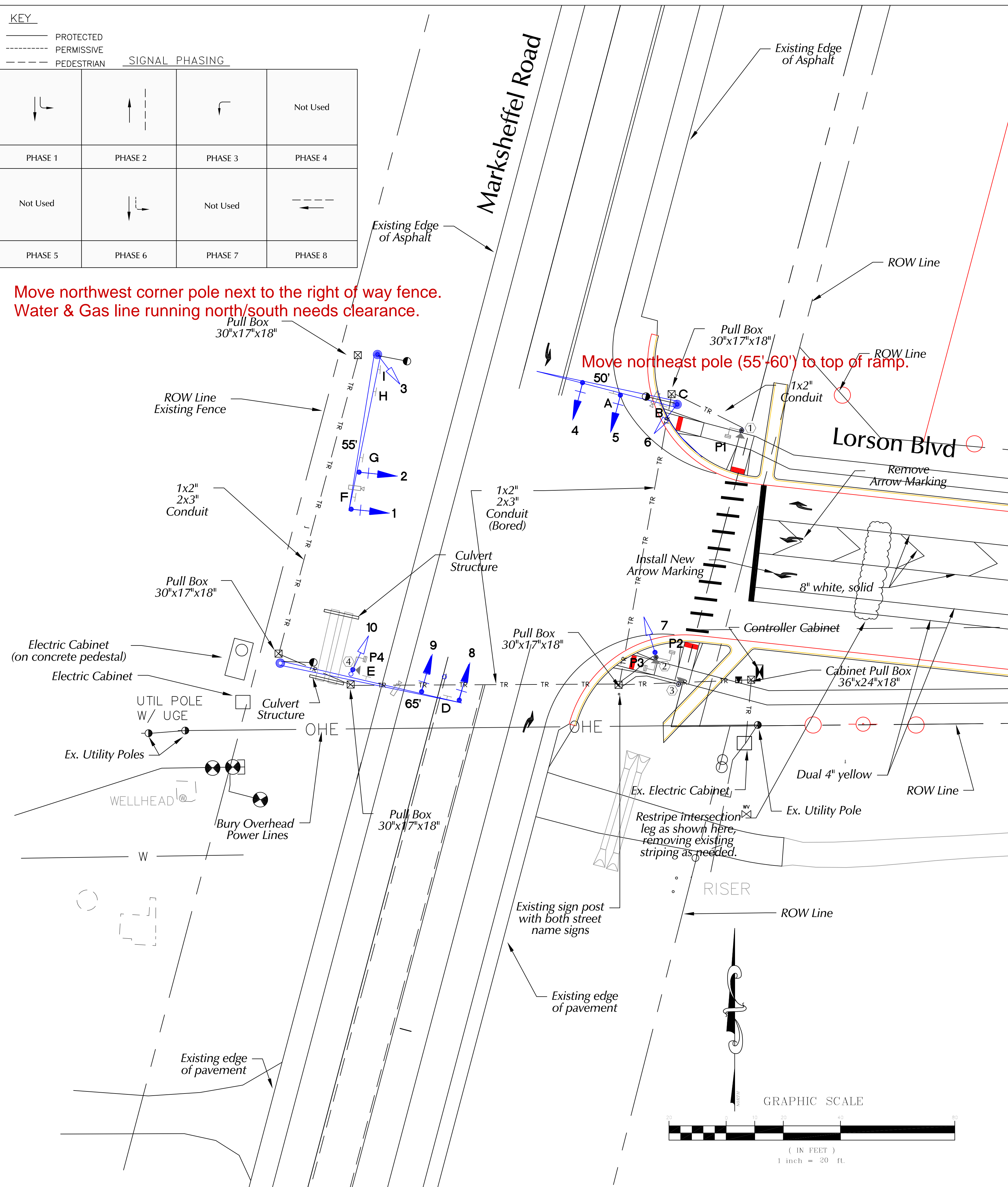
ITEM #	ITEM	UNIT	QUANTITY
202-00840	ELECTRICAL CONDUIT (2") PVC SCHEDULE 80 (total linear feet of conduit)	LF	289
202-00848	ELECTRICAL CONDUIT (3") PVC SCHEDULE 80 (total linear feet of conduit)	LF	484
	ELECTRICAL CONDUIT, BORED, (2") PVC SCHEDULE 80 (total linear feet of conduit)	LF	331
	ELECTRICAL CONDUIT, BORED, (3") PVC SCHEDULE 80 (total linear feet of conduit)	LF	662
614-72860	TRAFFIC SIGNAL FACE - LED (12,12,12) NO BACKPLATE	EACH	3
	TRAFFIC SIGNAL FACE - LED (12,12,12) WITH BACKPLATE	EACH	5
	TRAFFIC SIGNAL FACE - FOUR-SECTION LED LEFT TURN ARROWS (12,12,12,12) WITH BACKPLATE	EACH	1
	TRAFFIC SIGNAL FACE - FOUR-SECTION LED LEFT TURN ARROWS (12,12,12,12) NO BACKPLATE	EACH	1
614-70150	PEDESTRIAN SIGNAL HEAD - COUNTDOWN	EACH	4
614-72860	PEDESTRIAN PUSH BUTTON (BULLDOG STYLE W/ 2" DEEP HOUSING) W/ INFO SIGN (MUTCD #R10-3e)	EACH	4
	SIGNAL POLE, STEEL, W/ 50' MAST ARM	EACH	1
	SIGNAL POLE, STEEL, W/ 55' MAST ARM	EACH	1
	SIGNAL POLE, STEEL, W/ 65' MAST ARM	EACH	1
202-00840	PEDESTAL POST - 5.5' HIGH (FOR PUSH BUTTONS & INFO SIGNS ONLY)	EACH	1
	PEDESTAL POST - 12' HIGH (FOR MOUNTING PUSH BUTTONS, INFO SIGNS, PED HEAD)	EACH	1
	PEDESTAL POST, STEEL - 15' HIGH (FOR MOUNTING SIGNAL HEAD, PED HEAD, PUSH BUTTONS, INFO SIGN)	EACH	2
613-70250	LUMINAIRE WITH MAST ARM - 15' MAST ARM (LED)	EACH	3
NA	VIDEO DETECTION CAMERA - CITY STANDARD - WITH HARDWARE FOR SIGNAL POLE MOUNTING	EACH	3
NA	VIDEO DETECTION PROCESSOR AND OTHER EQUIPMENT - CITY STANDARD	LS	1
NA	PULL BOX (30"x17"x18")	EACH	6
NA	PULL BOX (36"x24"x18") ADJACENT TO CABINET	EACH	1
202-00840	STREET NAME SIGN ASSEMBLY, SIGNAL POLE MOUNTED ON CANTILEVER ARM (SW on Mast Arm)	EACH	3
700-90064	SAFETRAN 332 C/S CABINET SYSTEM	LS	1
	CABINET FOUNDATION FOR 332CS ON A ROCK FIBER BASE	EACH	1
503-0018	DRILLED CAISSON (18 INCH) - 4 EA - SEE PEDESTAL POLE SCHEDULE	LF	17
503-0036	DRILLED CAISSON (36"x14") - 1 EA - SEE SIGNAL POLE SCHEDULE	LF	14
503-0042	DRILLED CAISSON (42"x14") - 2 EA - SEE SIGNAL POLE SCHEDULE	LF	28
NA	POWER METER PEDESTAL	EACH	1
700-90064	FURNISH AND INSTALL ELECTRICAL SERVICE	LS	1
613-10000	WIRING	LS	1

SIGNAL POLE SCHEDULE

LOCATION	NE CORNER	SE CORNER (FUTURE ONLY)	SW CORNER	NW CORNER
NORTHING	TBD	FUTURE	TBD	TBD
EASTING	TBD	FUTURE	TBD	TBD
CAISSON ELEV.	TBD	FUTURE	TBD	TBD
BASE DIA.	36"	14"	42"	14"
DEPTH/*	3'		2'	6'

PEDESTAL POLE SCHEDULE

POST REFERENCE NUMBER	1	2	3	4
LOCATION	NE CORNER	SE CORNER	SE CORNER	SE CORNER
HEIGHT	10'	15'	5'	15'
NORTHING	TBD	TBD	TBD	TBD
EASTING	TBD	TBD	TBD	TBD
CAISSON ELEV.	TBD	TBD	TBD	TBD
BASE DIA.	18"	3'	18"	6'
DEPTH	3'		2'	6'



NEW TRAFFIC CONTROL SIGNAL PLAN  
Mast-Arm Traffic Signal Plan Sheet  
Marksheffel Road & Lorson Boulevard



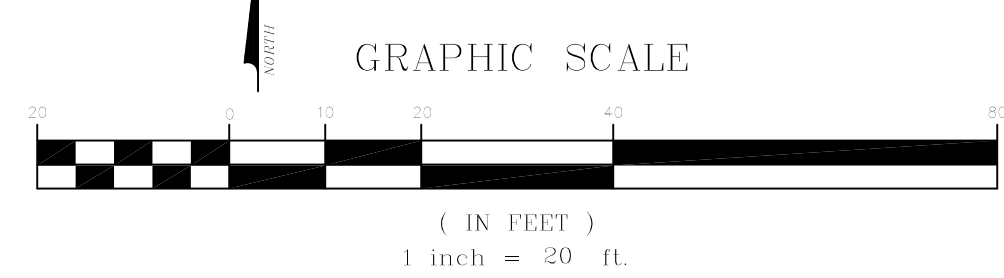
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Prepared By: JEFFREY C. HOUSLON, PE

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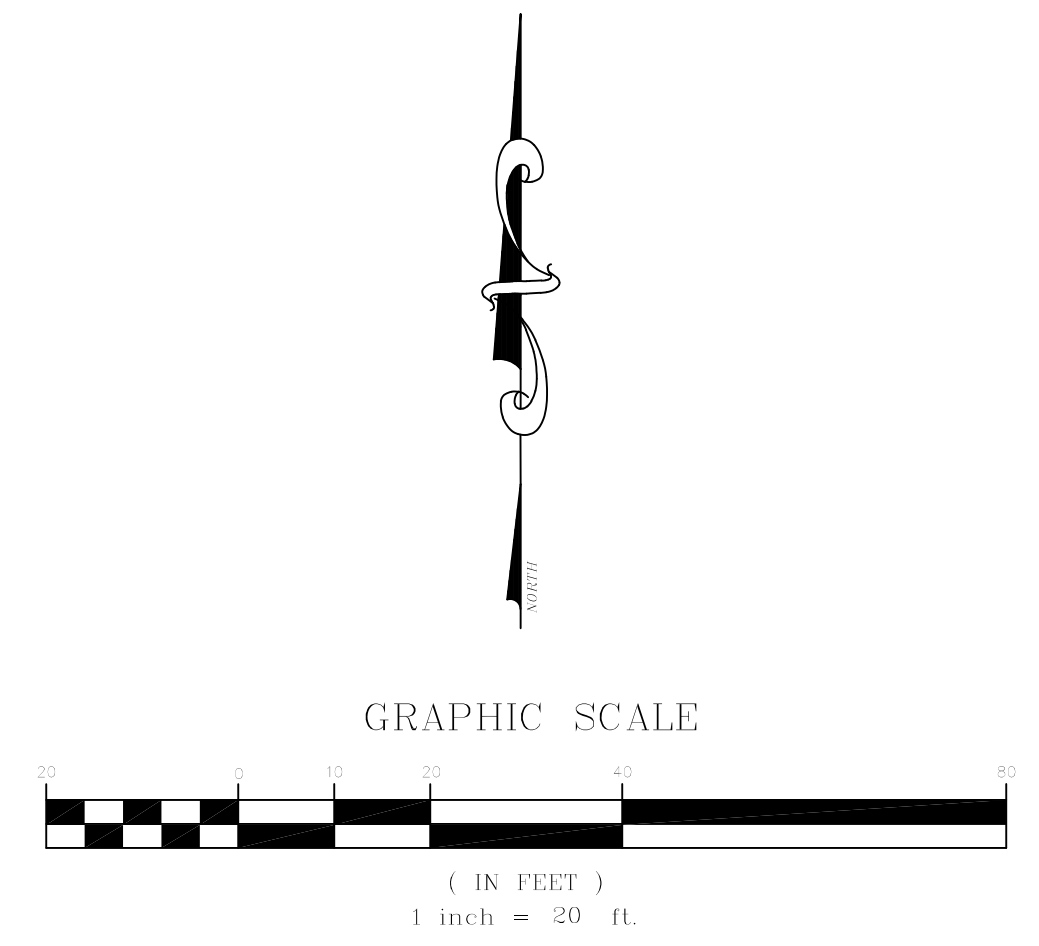
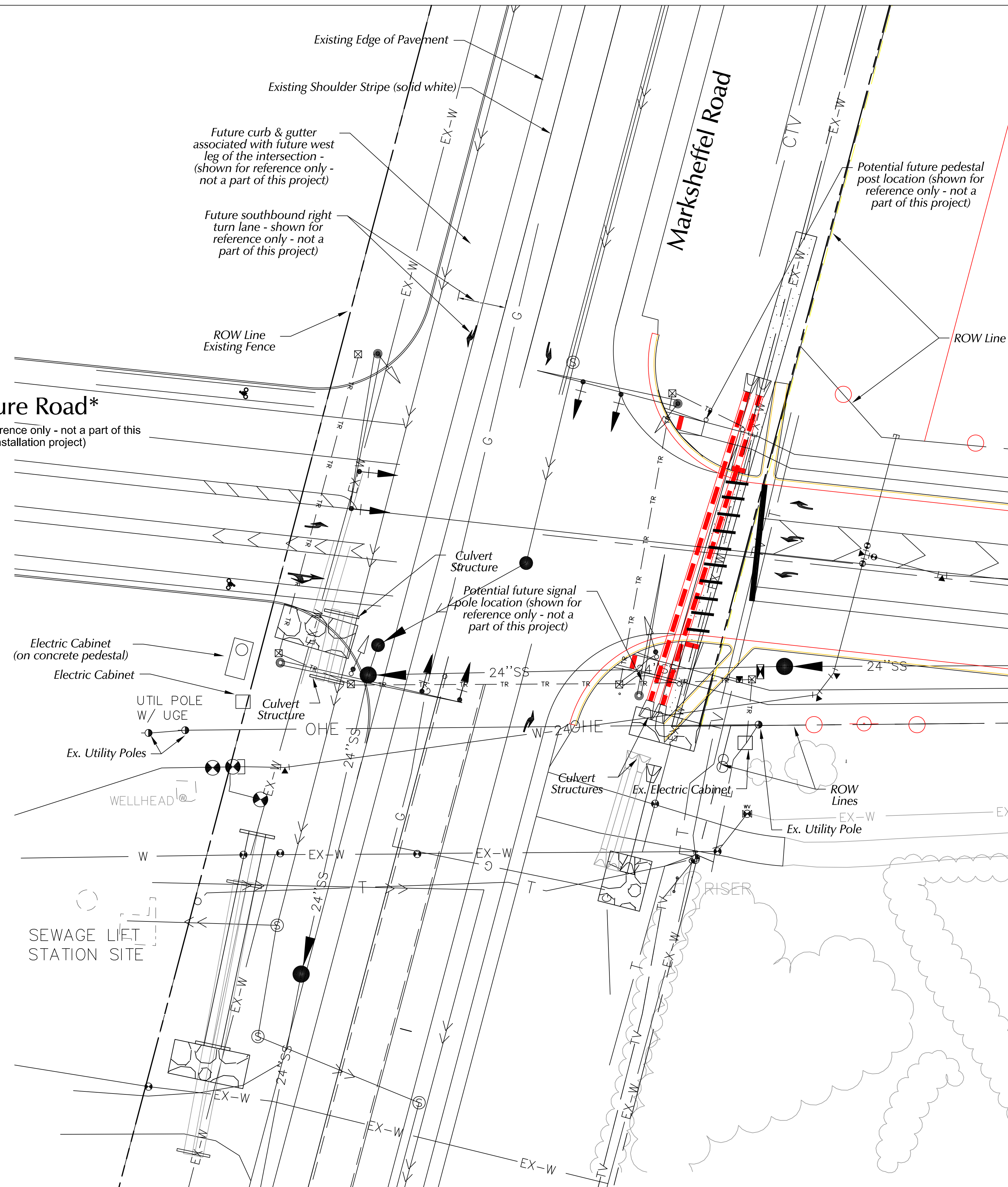
DATE: 4/17/23  
SCALE: 1" = 20'  
DRAWN BY: MJW/JCH  
JOB NO.: S224170  
DWG: S224170 Signal Plan She

SHT NO.: 2  
OF 3



\* The future 4th/west leg of the intersection is shown for reference only. This sheet shows future curb provided by Matrix Design Group, west leg striping and markings (LSC modified version of original provided by Matrix Design Group), utilities, and other base infrastructure, for reference.

**Future Road\***  
(for reference only - not a part of this signal installation project)



# NEW TRAFFIC CONTROL SIGNAL PLAN

## Future West Leg, Utilities, Civil Base Marksheffel Road. & Lorson Boulevard

**LSC TRANSPORTATION CONSULTANTS**  
TRANSPORTATION CONSULTANTS, INC.  
 2504 E. Pike's Peak Ave., Ste. 304 Colorado Springs, Co. 80909  
 TELEPHONE: 719.633.2868 FAX: 719.633.5430

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Prepared By:  
JEFFREY C. HOODSON, PE

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City & County Comments	6/30/23

DATE: 4/17/23  
 SCALE: 1" = 20'  
 DRAWN BY: M.J.W./J.C.H.  
 JOB NO.: S224170  
 DWG: S224170 Signal Plan Sheet

SHT NO. : **3**  
 OF **3**