

Construction Drawings for Meridian Rd./Bent Grass Meadows Dr. Intersection Improvements

Bent Grass Metro District, County of El Paso, State of Colorado

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VICINITY

List of agencies (stakeholder) with addresses & points of contact

Applicant: Bent Grass Metropolitan District c/o Randy Case II 102 E. Pikes Peak, Colorado Springs, Co. 80903

Civil Engineer: Classic Consulting, 619 N. Cascade Ave. Suite 200 Colorado Springs, CO 80903

Traffic Engineer: LSC Transportation Consultants, Inc., 2504 E. Pikes Peak Ave., Suite 304 Colorado Springs, CO 80909, Jeff Hoddsdon, 719-633-2898

Local Improvement District: Bent Grass Metropolitan District: c/o Randy Case II, 102 E Pikes Peak Ave, Colorado Springs, CO 80903; Phone:(719) 633-2700.

El Paso County Engineering: EPC Public Services, 3275 Akers Drive, Colorado Springs, CO 80922, [Jennifer Irvine, P.E., County Engineer]

Fire District or Department: Falcon Fire Protection District, Chief Trent Harwig, 7030 N. Meridian Road, Falcon, CO 80831 719-495-4050

Utility Company (Electric): Mountain View Electric, Jim Kennel, 11140 E. Woodmen Road Falcon, CO 80831, 719-495-2283

Utility Company (Telephone): Falcon Broadband, Randy BeYoung, 555 Hathaway Drive Colorado Springs, CO 80915, 719-886-7901

Utility Company (Gas): CSU, Todd Sturtevant, John Pinkerton Location, 7710 Durant Dr Colorado Springs, CO 80920, 719-668-3556

Utility Company (Water): Cherokee Metro District, Art Sintas, 6250 Palmer Park Blvd. Colorado Springs CO 80915, 719-597-5080

Utility Company (Cable): Cherokee Metro District, Art Sintas, 6250 Palmer Park Blvd. Colorado Springs CO 80915, 719-597-5080

Design Engineer's Signature & Stamp:

These detailed plans and specifications were prepared under my direction and supervision. Said plans and specifications have been prepared according to the criteria established by the County for detailed roadway, drainage, grading and erosion control plans and specifications, and said plans and specifications are in conformity with applicable master drainage plans and master transportation plans. Said plans and specifications meet the purposes for which the particular roadway and drainage facilities are designed and are correct to the best of my knowledge and belief. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparation of these detailed plans and specifications.

Jeffrey C. Hoddsdon, P.E. #31684 Date _____

Owner/Developer's Statement:

I, the owner/developer have read and will comply with all of the requirements specified in these detailed plans and specifications.

Title: _____ Date _____
Business Name: Challenger Communities, LLC
Address: 8605 Explorer Dr. Suite 250, Colorado Springs, CO 80920

El Paso County:

County plan review is provided only for general conformance with County Design Criteria. The County is not responsible for the accuracy and adequacy of the design, dimensions, and/or elevations which shall be confirmed at the job site. The County through the approval of this document assumes no responsibility for completeness and/or accuracy of this document.

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volumes 1 and 2, and Engineering Criteria Manual as amended.

In accordance with ECM Section 1.12, these construction documents will be valid for construction for a period of 2 years from the date signed by the El Paso County Engineer. If construction has not started within those 2 years, the plans will need to be resubmitted for approval, including payment of review fees at the Planning and Community Development Directors discretion.

Jennifer Irvine, P.E. Date _____
County Engineer / ECM Administrator

TRAFFIC CONTROL
SIGNAL PLANS
Bent Grass Meadows Dr./Meridian Rd.

545 East Pikes Peak Avenue Suite 210 Colorado Springs, CO 80909

LSC TRANSPORTATION CONSULTANTS

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Project Manager
JEFFREY C. HODSDON, PE

REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17
DATE:	3/17/16
SCALE:	1" = 600'
DRAWN BY:	MR
JOB NO.:	154560
DWG:	194900_Signal Plan Sheet

SHT NO. : 1
OF 5

GENERAL NOTES

PROJECT DESCRIPTION

TRAFFIC SIGNAL INSTALLATION, SIGNING AND MARKING AT BENT GRASS MEADOWS DRIVE AND MERIDIAN ROAD.

GENERAL NOTES

- THE OWNER / DEVELOPER / DISTRICT SHALL CONTRACT WITH A QUALIFIED PROFESSIONAL ENGINEERING CONSULTANT FOR THE DESIGN, DEVELOPMENT, AND PROGRAMMING OF ALL TRAFFIC SIGNAL TIMING AND CONTROLLER OPERATIONAL PARAMETERS, SETTINGS, ADJUSTMENTS, AND EQUIPMENT THAT WILL ACHIEVE SATISFACTORY TRAFFIC SIGNAL OPERATION, INCLUDING ISOLATED, INDEPENDENT, FULLY-ACTUATED SIGNAL OPERATION AND SIGNAL SYSTEM COORDINATION TIMING PLANS OPERATION WITH EXISTING ADJACENT SIGNALIZED INTERSECTIONS, WHERE DOCUMENTED TO BE NECESSARY DURING VARIOUS TIMES OF THE DAY.
- TRAFFIC SIGNAL MATERIALS AND INSTALLATION SHALL COMPLY WITH THE SPECIFICATIONS FOR THIS PROJECT, THE PROJECT SPECIAL PROVISIONS, "STATE OF COLORADO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", "COLORADO STANDARD PLANS", "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "THE NATIONAL ELECTRIC CODE", AND ALL LOCAL ORDINANCES AND REGULATIONS.
- THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) **STANDARD PLAN S-614-41 (7/31/19) "TEMPORARY SPAN WIRE SIGNALS"** ARE TO BE USED TO CONSTRUCT THIS PROJECT. EXCEPT THAT ALL POLES, ~~MAST ARMS,~~ AND EQUIPMENT SHALL BE PAINTED BLACK.
- ALL SUBMITTALS SHALL BE MADE TO EL PASO COUNTY FOR APPROVAL. OBTAIN ALL REQUIRED PERMITS FOR THE WORK. PREPARE AND SUBMIT TRAFFIC CONTROL PLAN FOR THE WORK. CONTACT EL PASO COUNTY 96 HOURS IN ADVANCE OF BEGINNING CONSTRUCTION.
- LOCATIONS OF ALL CONDUIT RUNS, DETECTORS, POLES, CONTROLLER CABINETS, PULL BOXES, AND FOUNDATIONS SHALL BE FIELD APPROVED BY EL PASO COUNTY. THE CONTRACTOR SHALL VERIFY POLE FOUNDATION AND ANCHOR BOLT ELEVATIONS WITH RESPECT TO TOP OF EXISTING OR FUTURE CURB AND SLOPE OF SIDEWALK PRIOR TO INSTALLATION OF ANY EQUIPMENT.
- ALL PAVING, SIDEWALK, LANDSCAPING AND LAWN IRRIGATION SYSTEMS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED IN KIND, EQUAL TO OR EXCEEDING ORIGINAL CONDITIONS OR AS DIRECTED BY THE OWNER.
- PAVEMENT MARKINGS ARE SHOWN FOR INFORMATION ONLY. REFER TO STRIPING PLANS FOR DETAILS.
- CONTRACTOR TO VERIFY POWER SOURCE AND COORDINATE HOOK - UP WITH ELECTRIC UTILITY PROVIDER.
- CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

TRAFFIC SIGNAL NOTES

- THE CONTRACTOR SHALL PROVIDE, FOR REVIEW, BY THE ENGINEER, A COMPLETE TRAFFIC SIGNAL MATERIAL SUBMITTAL PACKAGE THAT CONTAINS . ALL OF THE PROPOSED TRAFFIC SIGNAL EQUIPMENT, INCLUDING MATERIAL SPECIFICATIONS AND DESCRIPTIONS THAT WILL BE NECESSARY TO COMPLETE THE TRAFFIC SIGNAL WORK. THE CONTRACTOR SHALL ALLOW FOR A MINIMUM THREE WEEK SUBMITTAL REVIEW PERIOD AND SHALL NOT ORDER ANY SIGNAL EQUIPMENT UNTIL AFTER A REVIEW OF ALL SUBMITTALS HAVE BEEN COMPLETED BY THE ENGINEER AND VERIFIED BY THE CONTRACTOR.
- FUNCTIONAL AND OPERATIONAL RESPONSIBILITY FOR ALL NEWLY INSTALLED AND EXISTING TRAFFIC SIGNAL EQUIPMENT WILL BECOME THE RESPONSIBILITY OF THE CONTRACTOR UNTIL FINAL ACCEPTANCE OF THE PROJECT. THE CONTRACTOR SHALL CONSIDER THIS WORK INCIDENTAL TO THE OVERALL WORK BEING PERFORMED AND SHALL BE INCLUDED AS PART OF THE PROJECT.
- SEE COLORADO DEPARTMENT OF TRANSPORTATION SIGNAL DETAILS FOR CONSTRUCTION/ INSTALLATION DETAILS NOT SHOWN ON THESE PLANS.
- ALL SIGNAL EQUIPMENT REMOVED BY THE CONTRACTOR SHALL BE SALVAGED AND BECOME THE PROPERTY OF EL PASO COUNTY. THE SALVAGED EQUIPMENT SHALL BE DELIVERED AS DIRECTED BY THE ENGINEER. DELIVERY OF SIGNAL EQUIPMENT WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE WORK FOR REMOVAL OF TRAFFIC SIGNAL EQUIPMENT.
- OVERHEAD STREET NAME SIGN DESIGN AND LAYOUT INFORMATION SHALL BE PER THE STREET NAME SIGN DETAIL CONTAINED IN THE PROJECT PLANS.
- TRAFFIC SIGNS MOUNTED ON SIGNAL POLES, ~~MAST ARMS, AND PEDESTALS~~ SHALL BE MOUNTED USING BANDING, ALUMINUM CHANNELS, AND BACKING ZEES PER APPLICABLE CDOT STANDARD PLANS, OR SIMILAR RIGID SIGN BRACING MOUNTING ASSEMBLY.
- ONCE THE PROFESSIONAL ENGINEERING CONSULTANT HAS COMPLETED ALL TRAFFIC SIGNAL CONTROLLER TIMING DEVELOPMENT AND CONTROLLER PROGRAMMING, THE CONTRACTOR WILL COORDINATE THE DELIVERY DATE OF THE PROGRAMMED TRAFFIC SIGNAL CONTROLLER FOR REVIEW BY THE EPC DEPARTMENT OF PUBLIC WORKS, HIGHWAY DIVISION SIGNAL SHOP AND SHALL ALLOW FOR A MINIMUM TWO WEEK REVIEW PERIOD. AFTER WHICH TIME THE CONTRACTOR MAY MAKE ARRANGEMENTS FOR PICKING UP THE SIGNAL CONTROLLER.

TRAFFIC SIGNAL NOTES (CONTINUED)

- CONTROLLER CABINET SHALL BE FURNISHED WITH A "BEST" DOOR LOCK KIT LOCK AND CORE IS "BEST": 5L6R LEFT AND RIGHT.
- CONDUIT IS TO BE REPLACED IN THE EVENT THAT EXISTING CONDUIT IS DAMAGED AND AS DIRECTED BY THE ENGINEER.
- ELECTRICAL SERVICE DISCONNECT BOXES SHALL BE LOCKABLE AND WEATHER PROOF WITH THE NEMA TYPE CIRCUIT BREAKER. ENCLOSURES SHALL BE PROVIDED AT THE CONNECTION POINT OF EACH POWER SOURCE OR POINT OF SERVICE AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL WIRING REQUIRED TO COMPLETE THE INSTALLATION AND ESTABLISH THE FUNCTIONALITY OF ALL TRAFFIC SIGNAL EQUIPMENT.
- ALL INCIDENTAL ITEMS NOT SHOWN IN THE SUMMARY OF APPROXIMATE QUANTITIES OR TABULATION OF SIGNAL EQUIPMENT SHALL BE CONSIDERED TO BE INCLUDED AS PART OF THE TRAFFIC SIGNAL INSTALLATION AND WILL NOT BE MEASURED AND PAID FOR SEPARATELY. ALL QUANTITIES ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK NECESSARY TO COMPLETE THE CONSTRUCTION SHOWN ON THESE PLANS.
- THE SIGNAL SHALL NOT BE TURNED ON OR STARTED UNTIL DIRECTED BY THE ENGINEER. PRIOR TO SIGNAL ACTIVATION, THE ENGINEER SHALL CONFIRM THAT THE APPROPRIATE PAVEMENT MARKINGS AND SIGNING ARE IN PLACE AND THAT ALL WORK NECESSARY FOR PROPER SIGNAL OPERATION HAS BEEN COMPLETED.
- THE SIGNAL CONTROLLER SHALL BE A MODEL 170E-HC11 AND THE CONFLICT MONITOR SHALL BE A MODEL 2018. THE CONTROLLER CABINET SHALL BE A CDOT SPECIFICATION MODEL 332 THAT INCLUDES ONE FULL SIZE FRONT DOOR AND ONE FULL SIZE REAR DOOR AND SHALL CONTAIN ANTI -GRAFFITI SILVER FINISH COATING. THE CABINET SHALL BE MOUNTED ON A CAST-IN-PLACE CONCRETE FOUNDATION PER APPLICABLE CDOT'S STANDARDS STANDARD PLAN AND THE (CABINET SHALL BE POSITIONED SUCH THAT, WITH THE FRONT DOOR OPEN, BOTH THE CONTROLLER DISPLAY AND THE SIGNAL INSTALLATION WILL BE VISIBLE.
- LUMINAIRES SHALL CONSIST OF AN ASSEMBLY THAT UTILIZES LEDS AS THE LIGHT SOURCE. IN ADDITION, A COMPLETE LUMINAIRE SHALL CONSIST OF A HOUSING, LED ARRAY, AND ELECTRONIC DRIVER (POWER SUPPLY). ALL LUMINAIRES SHALL BE WIRED 240 WITH MULTI-TAP HEADS. THE LED FIXTURE MUST HAVE A COLOR TEMPERATURE OF 4100K (+/- 500K), MUST BE DESIGNED TO OPERATE AT A TEMPERATURE RANGE OF -40°F TO 105°F (-40°C TO 40°C), AND PROVIDE A MINIMUM OF 70,000 HOURS OF OPERATION. LUMINAIRES SHALL BE DIALIGHT STREETSENSE LED STREET LIGHT, OR APPROVED EQUAL. THE CONTRACTOR SHALL PROVIDE A RECOMMENDATION FOR THE TYPE OF STREET LIGHT BASED ON THE CONSTRUCTION PLANS AND MANUFACTURER'S SPECIFICATIONS, TO BE APPROVED BY THE ENGINEER. THE FIXTURE MUST BE CAST ALUMINUM, PROVIDED WITH FUSING, SURGE SUPPRESSION AND MUST BE UL LISTED FOR WET LOCATIONS. THE FIXTURE MUST HAVE AN INTERNAL, WEATHER-TIGHT LED DRIVE. NO ACTIVE COOLING FEATURES (FANS, ETC.) WILL BE ALLOWED. THE FINISH SHALL MATCH THE EXTENSION ARM SHAFTS. THE LUMINAIRES WILL BE INSTALLED ON 15 FOOT EXTENSION ARM SHAFTS AT A NOMINAL HEIGHT OF 40 FEET AND SHALL BE WELDED TO THE SIGNAL POLE PER CDOT TYPICAL TRAFFIC SIGNAL INSTALLATION DETAILS STAND PLAN S-614-40. LUMINAIRE ARM SHAFT PLACEMENT AND ORIENTATION SHALL BE IN ACCORDANCE WITH THE PROJECT PLANS..
- THE INTERSECTION DETECTION SYSTEM (MICROWAVE RADAR) CONTRACT ITEM INCLUDES DEVICE INSTALLATION (I.E., DETECTOR UNIT, HARDWARE, WIRING, PROCESSOR MODULE, ETC.), AND VERIFICATION OF SUCCESSFUL IN-FIELD DETECTION ZONE OPERATION BASED ON SEVERAL VEHICLE ACTUATIONS IN ALL DETECTION ZONES.
- THE CONTRACTOR SHALL COORDINATE THE SCHEDULES OF THE CONTRACTED PROFESSIONAL ENGINEERING CONSULTANT AND THE EPC DEPARTMENT OF PUBLIC WORKS, HIGHWAY DIVISION TRAFFIC SIGNAL STAFF FOR SCHEDULING THE ON-SITE FIELD IMPLEMENTATION OF ALL TRAFFIC SIGNAL TIMING AND OPERATIONAL PROGRAMMING, VEHICLE DETECTION ZONE PLACEMENT, AND DETECTION EQUIPMENT POSITIONING. THIS WORK SHALL BE SCHEDULED NEAR THE END OF THE PROJECT, PRIOR TO PROJECT ACCEPTANCE, AND ONLY AFTER ALL FINAL PAVEMENT MARKINGS, SIGNING, AND TRAFFIC SIGNAL WORK HAS BEEN COMPLETED.
- THE MICROWAVE RADAR DETECTION SYSTEM SHALL UTILIZE MS SEDCO INTERSECTOR TC-CK1-SBE WITH INTERFACE BOARD)
- PEDESTRIAN SIGNAL HEAD INSTALLATION SHALL INCLUDE ALUMINUM AND POWDER COATED GLOSS BLACK SIGNAL HEAD WITH APPROVED LED COUNTDOWN DISPLAY, ALUMINUM OPEN VISOR WITH THE OUTSIDE POWDER COATED GLOSS BLACK, PUSHBUTTON, AND INSTRUCTIONAL R10-3E COUNTDOWN PEDESTRIAN ACTUATION SIGN. PUSHBUTTON SHALL BE VANDAL-RESISTENT PIEZO DRIVEN SOLID STATE TECHNOLOGY SWITCH, BULLDOG MOMENTARY LED TYPE.
- ALL TRAFFIC SIGNAL POLES, ~~MAST ARMS, PEDESTALS,~~ AND LUMINAIRE ARMS SHALL HAVE A GLOSS BLACK COAT FINISH OVER HOT DIP GALVANIZED BASE COAT, INSTALLED IN ACCORDANCE WITH THE PAINT MANUFACTURER 'S INSTRUCTIONS .
- ALL SIGNAL POLE AND CONTROLLER LOCATIONS SHOWN ARE APPROXIMATE ONLY. ~~MAST ARMS SHALL BE OF SUFFICIENT LENGTH AND DESIGN TO ALLOW PROPER PLACEMENT OF SIGNAL HEADS AND OVERHEAD SIGNING PER THE PLANS. ACTUAL LOCATIONS SHALL BE STAKED IN THE FIELD AND FIELD VERIFIED BY THE ENGINEER PRIOR TO DRILLING, EXCAVATION, AND ORDERING THE SIGNAL EQUIPMENT AND MAST ARMS. THE LOCATION OF EACH SIGNAL POLE FOUNDATION SHALL BE POTHOLED PRIOR TO DRILLING TO CONFIRM WHETHER OR NOT ANY UTILITY CONFLICTS EXIST.~~

TRAFFIC SIGNAL NOTES (CONTINUED)

- 22 LATERAL OFFSETS FROM THE NEAR EDGE OF TRAFFIC SIGNAL POLES, PEDESTALS, AND CABINETS TO THE FACE OF CURB OR THE EDGE OF A PAVED SHOULDER SHOULD BE AT LEAST SIX FEET. HOWEVER, A MINIMUM LATIERAL OFFSET OF AT LEAST FOUR FEET MAY BE PROVIDED FOR CURB OFFSETS. IF NO PAVED SHOULDER EXISTS, A MINIMUM LATERAL OFFSET OF AT LEAST EIGHT FEET SHOULD BE PROVIDED FROM THE EDGE OF PAVEMENT FOR AN AUXILIARY LANE AND A MINIMUM LATERAL OFFSET OF AT LEAST TWELVE FEET SHOULD BE PROVIDED FROM THE EDGE OF PAVEMENT FOR A THROUGH LANE.
- 23 SHOULD THE CONTRACTOR ENCOUNTER WATER IN THE CAISSON, ANY DE-WATERING METHODS AND NECESSARY PERMITS SHALL BE INCLUDED IN THE COST OF THE CAISSON AND WILL BE CONSIDERED INCIDENTAL TO THE WORK.
- 24 ALL TRAFFIC SIGNAL COMPONENT PULL BOXES SHALL BE PRE CAST HIGH DENSITY POLYMER CONCRETE (HDPC) MATERIAL WITH THE FOLLOWING SIZES: 30 INCH X 48 INCH X 18 INCH FOR THE PULL BOX ADJACENT TO THE CONTROLLER CABINET FOUNDATION AND 24 INCH X 36 INCH X 18 INCH FOR THE REMAINING PULL BOXES.
- 25 TRAFFIC PULL BOX LOCATIONS SHOWN IN THE PROJECT PLANS ARE APPROXIMATE. ACTUAL LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER. PULL BOXES SHALL BE FLUSH WITH THE FINISHED GROUND SURFACE AND SHALL NOT BE PLACED IN AREAS THAT ARE SUSCEPTIBLE TO WATER RUN OFF OR STANDING WATER. CONDUIT RUNS BETWEEN PULL BOXES SHALL NOT EXCEED APPROXIMATELY 200 FEET AND PULL BOXES SHALL NOT BE LOCATED IN HANDICAP RAMPS, PEDESTRIAN LANDING AREAS, SIDEWALKS, PRIMARY SIDEWALK PATHS, OR ROADWAY PAVEMENT AREAS.
- 26 THE CONDUIT NUMBERS AND SIZES FOR TYPICAL CONDUIT RUNS INCLUDE THE FOLLOWING FOR A PERMANENT, MAST ARM SIGNAL INSTALLATION: A.) BETWEEN THE SIGNAL POLE FOUNDATION AND ADJACENT SIGNAL POLE PULL BOX: TWO (2) 2 INCH AND ONE (1) - 3 INCH; B.) BETWEEN SIGNAL POLE PULL BOXES: TWO (2) - 2 INCH AND THREE (3) - 3 INCH; C.) BETWEEN THE CONTROLLER CABINET FOUNDATION AND ADJACENT PULL BOX: THREE (3) - 2 INCH AND FOUR (4) 3 INCH; D.) BETWEEN THE SECONDARY SERVICE PEDESTAL METER FOUNDATION AND THE CONTROLLER FOUNDATION: ONE (1) - 2 INCH FOR THE ELECTRICAL SERVICE FEED.
- 27 ALL CONDUIT AND FITTINGS SHALL BE SCHEDULE 80 PVC AND ALL CONDUIT SHALL HAVE A PULL ROPE LEFT IN THEM WHEN CONSTRUCTION IS COMPLETED. ALL CONDUIT ENTERING THE CABINET FOUNDATION AND PULL BOXES SHALL HAVE BELL END STYLE COUPLINGS ON ALL CONDUIT ENDS.
- 28 ALL CONDUIT THAT IS DIRECTIONALLY BORED SHALL BE A MINIMUM OF THREE FEET BELOW THE EXISTING PAVEMENT. THIS WORK SHALL AVOID DISTURBING OR DAMAGING EXISTING FACILITIES AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROMPT RECONSTRUCTION, ALTERATION, REPAIR, OR MAINTENANCE OF THE HIGHWAY PROPERLY, AS NECESSARY, TO REPAIR ANY DAMAGE CAUSED BY THE ACCOMMODATION OF THE UTILITY, AND TO RESTORE THE HIGHWAY TO PRE-EXISTING OR BETTER CONDITIONS.
- 29 ALL SIGNAL CABLE SHALL BE CONTINUOUS FROM CONNECTIONS MADE IN THE HAND HOLE COMPARTMENT OF THE SIGNAL POLE BASE TO THE TERMINAL COMPARTMENT IN THE CONTROLLER CABINET AND SHALL CONTAIN NO SPLICES. EACH SIGNAL HEAD SHALL CONTAIN SEPARATE AND CONTINUOUS SIGNAL CABLE THE SIGNAL HEAD TO THE ABOVE GROUND HAND HOLE AT THE BASE OF THE SIGNAL POLE AND SHALL CONTAIN NO SPLICES.
- 30 A SEPARATE AND CONTINUOUS 21 CONDUCTOR CABLE SHALL RUN FROM THE CONTROLLER CABINET TO THE HAND HOLE AT EACH SIGNAL POLE AND SHALL CONTAIN NO SPLICES.
- 31 ALL SIGNS MOUNTED ON SIGNAL POLES, MAST ARMS, AND PEDESTALS SHALL BE MOUNTED USING BANDING ALUMINUM CHANNELS, AND BACKING ZEES PER CDOT TYPICAL POLE MOUNT SIGN INSTALLATIONS STANDARD PLAN S-614-20, OR SIMILAR RIGID SIGN BRACING MOUNTING ASSEMBLY, AS DIRECTED BY THE ENGINEER. MAST ARM SIGNS THAT REQUIRE Z-BRACKETS SHALL BE MOUNTED ON ASTRO-STYLE BRACKETS AND RISERS. THE COST OF ALL HARDWARE, FITTING, TOOLS, AND EQUIPMENT NECESSARY FOR A COMPLETE INSTALLATION OF MAST ARM SIGNS WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
- 32 ALL CONDUCTORS AND CABINET WIRING SHALL BE COLOR CODED AND PERMANENTLY TAGGED PER ENGINEER DIRECTION AND IN ACCORDANCE WITH THE SIGNAL PHASE NUMBERING AND VIDEO DETECTION ZONE PHASE NUMBERING INFORMATION CONTAINED IN THE PROJECT PLANS.
- 33 ALL VEHICLE SIGNAL HEADS SHALL HAVE APPROVED 12 INCH LED INDICATIONS AND SHALL BE ALUMINUM WITH POWDER COATED GLOSS BLACK FINISH AND SHALL CONTAIN 12 INCH ALUMINUM TUNNEL VISORS WITH THE OUTSIDE POWDER COATED GLASS BLACK. ~~ALL VEHICLE SIGNAL HEADS SHALL HAVE ALUMINUM LOUVERED BACK PLATES WITH POWDER COATED GLOSS BLACK FINISH. MAST ARM SIGNAL HEADS SHALL USE ASTRO-TYPE MOUNTING ASSEMBLIES AND SHALL BE INSTALLED APPROXIMATELY LEVEL WITH ONE ANOTHER AT A 17 TO 19 FOOT VERTICAL CLEARANCE ABOVE THE HIGH POINT OF THE PAVEMENT GRADE.~~
- 34 FINAL VEHICLE DETECTION ZONE PLACEMENT AND DIMENSIONS, IN ACCORDANCE WITH THE PROJECT PLANS, AND FINAL SIGNAL PROGRAMMING SHALL BE COMPLETED IN THE FIELD AND THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR COORDINATING AND SCHEDULING THIS WORK.
- 35 ALL VEHICLE AND PEDESTRIAN SIGNAL HEADS THAT HAVE NOT BEEN PLACED IN SERVICE SHALL BE COVERED WITH A PREFABRICATED WEATHER RESISTANT NYLON FORM FITTING SIGNAL FACE COVER MATERIAL. THE SIGNAL FACE SHALL REMAIN COMPLETELY COVERED UNTIL THE SIGNAL HEAD IS PLACED IN SERVICE AND IS FULLY FUNCTIONAL AND OPERATIONAL.

GENERAL NOTES Bent Grass Meadows Dr./Meridian Rd.



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REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 3/17/16
SCALE: NTS
DRAWN BY: R
JOB NO.: 54560
DWG: 94900_Signal Plan Sheets

SHT NO. 2
OF 5

GENERAL NOTES (CONT.)

TRAFFIC SIGNAL NOTES (CONTINUED)

36 ALL DETECTION EQUIPMENT, DETECTION ZONES, AND SIGNAL TIMING OPERATION SHALL BE CONFIRMED IN THE FIELD BY THE CONTRACTED PROFESSIONAL ENGINEERING CONSULTANT TO BE ACHIEVING SATISFACTORY TRAFFIC SIGNAL OPERATION.

37 RADIO TELEMETRY AND COMMUNICATION SYSTEM SHALL CONSIST OF A FREEWAVE HT-PE ETHERNET 900 MHZ RADIO TRANSMITTER/RECEIVER, PCTEL BLUEWAVE YAGI ANTENNA (890-960 MHZ, 6.5 DBD GAIN), BLUEWAVE SENTINEL SURGE SUPPRESSOR, AND ALL REQUIRED HARDWARE, AND WIRING. THE RADIO SHALL MEET THE FOLLOWING SPECIFICATIONS:

TRANSMITTER:

- FREQUENCY RANGE - 902 TO 928 MHZ (FHSS/FCC DTS)
- OUTPUT POWER - 5 MW TO 870 MW
- DATA LINK RANGE - 15 MILES, CLEAR LOS, HIGH SPEED
- MODULATION - 2 LEVEL GFSK
- RF DATA RATE - 614 KBPS STANDARD SPEED - 867 KBPS AT HIGH SPEED
- OCCUPIED BANDWIDTH - 611.2 KHZ
- HOPPING PATTERNS - 15 PER BAND, 105 TOTAL, USER-SELECTABLE
- HOPPING CHANNELS - 41
- FREQUENCY ZONES - 16 ZONES, 2-3 CHANNELS PER ZONE

RECEIVER:

- SENSITIVITY: -102DBM FOR BER 10-6 AT 614 KBPS; -96 DBM FOR BER 10-6 AT 867 KBPS

DATA TRANSMISSION:

- ERROR DETECTION: 32 BIT CRC, RETRANSMIT ON ERROR
- DATA SECURITY: AES 128 BIT ENCRYPTION FHSS TECHNOLOGY RADIUS
- SERIAL INTERFACE: RS232/RS422/RS485, PROGRAMMABLE; RJ-45 CONNECTORS
- ETHERNET INTERFACE: 802.3, IPV4, TCP, UDP, ICMP, ARP, MULTICAST, TFTP, DNP3 OVER TCP, VLAN, (2) 802.3U, FAST ETHERNET, RJ-45

POWER REQUIREMENTS:

- OPERATING VOLTAGE: +6 VDC TO +30 VDC

TYPICAL POWER: TRANSMIT: 6.6 W RECEIVE: 1.7 W - IDLE: 0.8 W

38 THE CONTRACTED PROFESSIONAL ENGINEERING TRAFFIC SIGNAL TIMING, CONTROLLER PROGRAMMING AND OPERATION, AND OVERALL TRAFFIC SIGNAL OPERATIONAL CONSULTANT SERVICES THAT ARE TO BE RETAINED BY THE OWNER / DEVELOPER / DISTRICT SHALL INCLUDE, BUT NOT BE LIMITED TO:

A. DEVELOPING ALL TRAFFIC SIGNAL TIMING AND OPERATIONAL PARAMETERS FOR ACHIEVING ISOLATED, FULL-ACTUATED VEHICLE AND PEDESTRIAN INTERSECTION OPERATION AND, WHEN DOCUMENTED TO BE NECESSARY, COORDINATED SIGNAL SYSTEM TIMING PLAN OPERATION DURING VARIOUS TIMES OF THE DAY,

B. PROGRAMMING ALL SIGNAL TIMING PARAMETERS INTO THE TRAFFIC SIGNAL CONTROLLER,

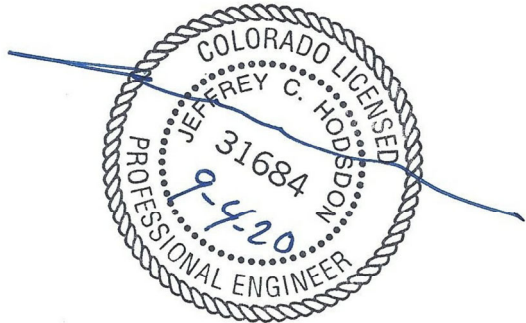
C. FIELD IMPLEMENTING AND FINE-TUNING / ADJUSTING ALL TRAFFIC SIGNAL TIMING PARAMETERS, INCLUDING FOLLOW-UP FIELD REVIEWS AS MAY BE NECESSARY,

D. DEVELOPING, PROGRAMMING, FIELD IMPLEMENTING, AND FINE-TUNING ALL VEHICLE DETECTION ZONE DIMENSIONS, ZONE LOCATIONS, AND OPERATIONAL PARAMETERS.

ALL OF THE AFOREMENTIONED CONTRACTED PROFESSIONAL ENGINEERING TRAFFIC SIGNAL OPERATIONAL CONSULTANT SERVICES DELIVERABLES SHALL BE CONSISTENT WITH NATIONAL PUBLICATIONS, INCLUDING, BUT NOT LIMITED TO: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) LATEST EDITION / REVISION, FHWA-HOP-08-024 "TRAFFIC SIGNAL TIMING MANUAL" (JUNE 2008), FHWA-HRT-04-091 "SIGNALIZED INTERSECTIONS: INFORMATIONAL GUIDE" (AUGUST 2004), FHWA-HOP-06-006 "TRAFFIC CONTROL SYSTEMS HANDBOOK" (OCTOBER 2005), FHWA-DTFH61-01-C-00183 "SIGNAL TIMING PROCESS FINAL REPORT" (DECEMBER 2003), NCHRP REPORT 731 "GUIDELINES FOR TIMING YELLOW AND ALL-RED INTERVALS AT SIGNALIZED INTERSECTIONS" (2012), NCHRP REPORT 812 "SIGNAL TIMING MANUAL SECOND EDITION" (2015)

SIGNING AND STRIPING NOTES

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PCD.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE "D" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4" UPPER-LOWER CASE LETTERING ON 8" BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6" LETTERING, UPPER-LOWER CASE ON 12" BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULT-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8" UPPER-LOWER CASE LETTERING ON 18" BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS"
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75" X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-8 REGARDING USE OF THE P2 TUBULAR STEEL POST SLIPBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100" MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24" IN WIDTH. CROSSWALKS LINES SHALL BE 12" WIDE AND 8' LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY PCD (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY PUBLIC WORKS DEPARTMENT (DPW) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.



GENERAL NOTES
Bent Grass Meadows Dr./Meridian Rd.

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Project Manager
JEFFREY C. HODSDON, PE

REVISIONS	DATE
Revisions #3	5/4/20
Span Wire Signal	5/1/18
Revisions #2	9/29/17
DATE:	3/17/16
SCALE:	NTS
DRAWN BY:	MR
JOB NO.:	154560
DWG:	194900_Signal Plan_Sheet

SHT NO. :3
OF 5

STREET NAME SIGNS

A Meridian Rd

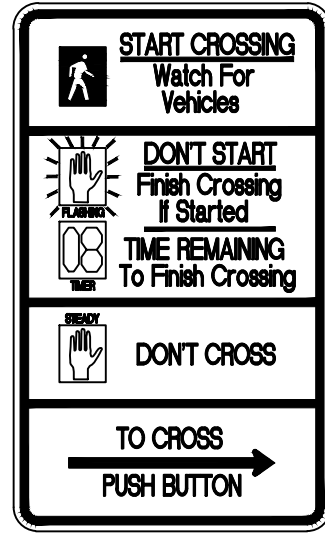
B Bent Grass Meadows Dr

Sign details to be included with shop drawing submittals

LEGEND

ITEM	NEW
TRAFFIC SIGNAL HEAD (NO BACKPLATE)	
TRAFFIC SIGNAL HEAD WITH BACKPLATE	
SIGNAL POLE, SPAN WIRE & FOUNDATION	
PEDESTAL POST	
ELECTRICAL CONDUIT RUN	
PEDESTRIAN PUSH BUTTON & INFO SIGN	
POWER METER	
PULL BOX	
LUMINAIRE W/ MAST ARM	
CONTROLLER CABINET	
16" LED PED SIGNAL HEAD	
SIGN, SIGNAL-POLE-MOUNTED	

SIGNS

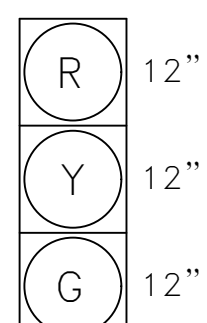
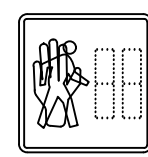
R10-3e (4 each)
(For use at pedestrian
push buttons)

D

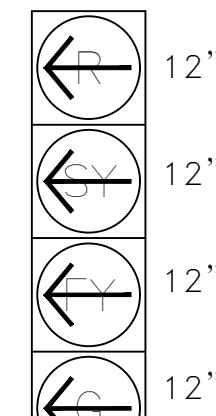


C

SIGNAL FACES

2-11
(no backplate)

P1-P2

1 12
(no backplate)

Signal Notes:

1. INSTALL NEW FOUNDATIONS, SIGNAL POLES, PEDESTAL POLES AND LUMINAIRE ARMS PER CDOT SPECIFICATIONS AT THE LOCATIONS SHOWN ON THIS PLAN SHEET. NORTHING/EASTING IS TO CENTER OF CAISSON. REFER TO SIGNAL POLE AND PEDESTRIAN POLE SCHEDULE TABLES SHOWN ON THIS SHEET. PLEASE REFER TO CDOT S-614-41 FOR SPECIFICATIONS. THESE ARE TO BE USED FOR THE TRAFFIC SIGNAL POLE AND CAISSON INSTALLATION FOR THIS PROJECT. THIS INCLUDES THE SPAN WIRE CABLE AND TETHER CABLE INSTALLATION, FASTENING SIGNAL HEADS TO THE SPAN WIRE AND TETHER CABLES AND OTHER ASSOCIATED INSTALLATION DETAILS SPECIFIC TO THE SPAN-WIRE TYPE SIGNAL.
2. VEHICLE DETECTION UNITS SHALL BE INSTALLED USING A MOUNTING ASSEMBLY IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS WITH PLACEMENT AND ORIENTATION IN ACCORDANCE WITH THE PROJECT PLANS OR PER MANUFACTURER INSTRUCTIONS.
3. ALL TRAFFIC SIGNAL HEADS SHALL BE ALIGNED WITH THE MIDDLE OF THE TRAFFIC LANES THAT THEY ARE INTENDED FOR. ALL SIGNAL HEAD LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
4. ALL SIGNAL EQUIPMENT, CONDUIT, AND PULL BOXES SHALL BE INSTALLED WITHIN THE PUBLIC RIGHT-OF-WAY.
5. THE CONTRACTOR SHALL SUPPLY SHOP DRAWINGS OF ALL SIGNAL EQUIPMENT TO THE ENGINEER AND OBTAIN APPROVAL PRIOR TO ORDERING.
6. THE EXACT PLACEMENT OF ALL TRAFFIC SIGNAL EQUIPMENT, SIGNING, AND STRIPING SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
7. THE CAISSONS SHALL BE INSTALLED ACCORDING TO CDOT STANDARDS (S-614-40).
8. ALL CONDUIT SHALL BE SCHEDULED 80 PVC UNLESS OTHERWISE NOTED. 1-2" AND 1-3" CONDUIT SHALL BE INSTALLED FROM EACH SIGNAL POLE TO THE NEAREST PULL BOX.
9. PEDESTRIAN PUSH BUTTONS SHALL BE P120 MODEL SE-2005-08 (ADA PEDESTRIAN PUSH BUTTON), OR ENGINEER APPROVED EQUAL. THE BUTTON HOUSING SHALL BE BLACK IN COLOR. THE PEDESTRIAN PUSH BUTTON SIGN SHALL BE R10-3E AS DESCRIBED IN THE MUTCD.
10. THE PEDESTRIAN SIGNALS SHALL BE LED COUNTDOWN. ALL VEHICLE SIGNAL INDICATIONS SHALL BE 12 INCH LED.
11. THE CONTRACTOR SHALL COORDINATE WITH MVEA ENERGY TO PROVIDE POWER TO THE SIGNAL AND LUMINAIRES. POWER TO THE SIGNAL WILL BE METERED AND SEPARATE FROM THE LUMINAIRE POWER.
12. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SURVEYING TO CONFIRM THE RIGHT-OF-WAY AND ESTABLISH SIGNAL POLE LOCATIONS. THE CONTRACTOR SHALL REPLACE SURVEY MONUMENTS THAT ARE DISTURBED DURING CONSTRUCTION.

Bent Grass Meadows Dr.

Extend conduit to power
source located at the SE corner
of the intersection of Bent Grass
Meadows and Meridian
Park Drive.



KEY

- PROTECTED
- PERMISSIVE
- PEDESTRIAN

SIGNAL PHASING

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

MATERIALS LIST

ITEM #	ITEM	UNIT	QUANTITY
614-81140	TRAFFIC SIGNAL POLE STEEL (SPAN WIRE) Black Anodized (not Galvanized)	EACH	4
	SPAN WIRE CABLE	LF	525
	TETHER CABLE	LF	500
614-70336	TRAFFIC SIGNAL FACE (LED) (12/12/12) - Black Aluminum Signal Heads (McCain)	EACH	10
	TRAFFIC SIGNAL FACE (LED) (12/12/12/12) LEFT TURN HEAD Black Aluminum (McCain)	EACH	2
613-00200	ELECTRICAL CONDUIT, (2") PVC SCHEDULE 80 (total linear feet of conduit)	LF	460
613-00300	ELECTRICAL CONDUIT, (3") PVC SCHEDULE 80 (total linear feet of conduit)	LF	200
614-70150	PEDESTRIAN SIGNAL FACE (COUNTDOWN) (16")	EACH	2
614-72860	PEDESTRIAN PUSH BUTTON (P120)	EACH	2
	INFO SIGN (MUTCD #R10-3e)(SEE ABOVE ILLUSTRATION)	EACH	2
614-72858	PEDESTAL POLE (3 FOOT 6 INCH) (FOR PUSH BUTTONS & INFO SIGNS ONLY)	EACH	0
614-84000	PEDESTAL POST- 12' HIGH (STEEL)	EACH	0
613-13000	LUMINAIRE (ESU-FA012M03250M-150-1512N) (E-Lite-Star)(WITH 15' MAST ARM	EACH	4
613-07034	PULL BOX (36"x48"x18") (AT CABINET)	EACH	1
613-07060	PULL BOX (24"x36"x18") (ADJACENT TO POLES)	EACH	1
614-10130	STREET NAME SIGN, SIGNAL-POLE-MOUNTED	EACH	3
614-72855	TRAFFIC SIGNAL CONTROLLER CABINET (332 D BATTERY BACKUP with Aux Rack)	EACH	1
614-86246	CONTROLLER (ATC EX 2070 Flex) (MCCAIN)	EACH	1
613-40000	CABINET FOUNDATION, CAST-IN-PLACE	EACH	1
503-00018	DRILLED CAISSON (18")- SEE PED POLE SCHEDULE (FOR PEDESTAL POSTS)	LF	0
503-00036	DRILLED CAISSON (36")- SEE SIGNAL POLE SCHEDULE	LF	64
613-50150	SECONDARY SERVICE PEDESTAL	EACH	1
700-90064	FURNISH AND INSTALL ELECTRICAL SERVICE	LS	1
613-00011	WIRING (IMSA Approved Wire)	LS	1
	MICROWAVE VEHICLE RADAR DETECTOR (MS Sedco Intersector)	EA	5
	CONFLICT MONITOR (2010ECLIP W/ ETHERNET PORT) (EDI)	EA	1
	Clary Battery Backup system (SP 1250-LX with six batteries)	EA	1
	Shielded Cat IV Cable for Radar Detectors	LF	
	MS Sedco Ethernet extenders (if the Cat IV cable run is over 300' in length)	EA	
	ETHERNET SWITCH (Dymex KY-3170 EMX MANAGED INDUSTRIAL, RACK MOUNT)	EA	1
	Cellular Modem (MicroHard Bullet-LTE)	EA	1

SIGNAL POLE SCHEDULE

LOCATION	NE CORNER	SE CORNER	SW CORNER	NW CORNER
NORTHING	TBD	TBD	TBD	TBD
EASTING	TBD	TBD	TBD	TBD
CAISSON ELEV.	TBD	TBD	TBD	TBD
BASE DIA.	36"	16'	36"	16'
DEPTH/*	36"	16'	36"	16'

*PAY LENGTH

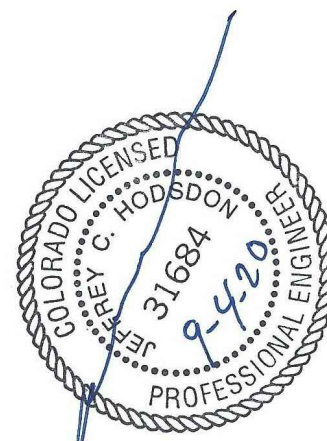
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Project Manager
JEFFREY C. HODSDON, PE

REVISIONS	DATE
Revisions #4	5/4/2020
Span Wire Signal	5/1/18
Revisions #2	9/29/17

DATE: 3/17/16
SCALE: 1"=20'
DRAWN BY: MR
JOB NO.: 194900/154560
DWG: 194900_Signal Plan Sheets 09222020.dwg



SHT NO. 4
OF 5

