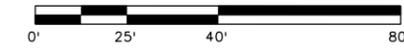


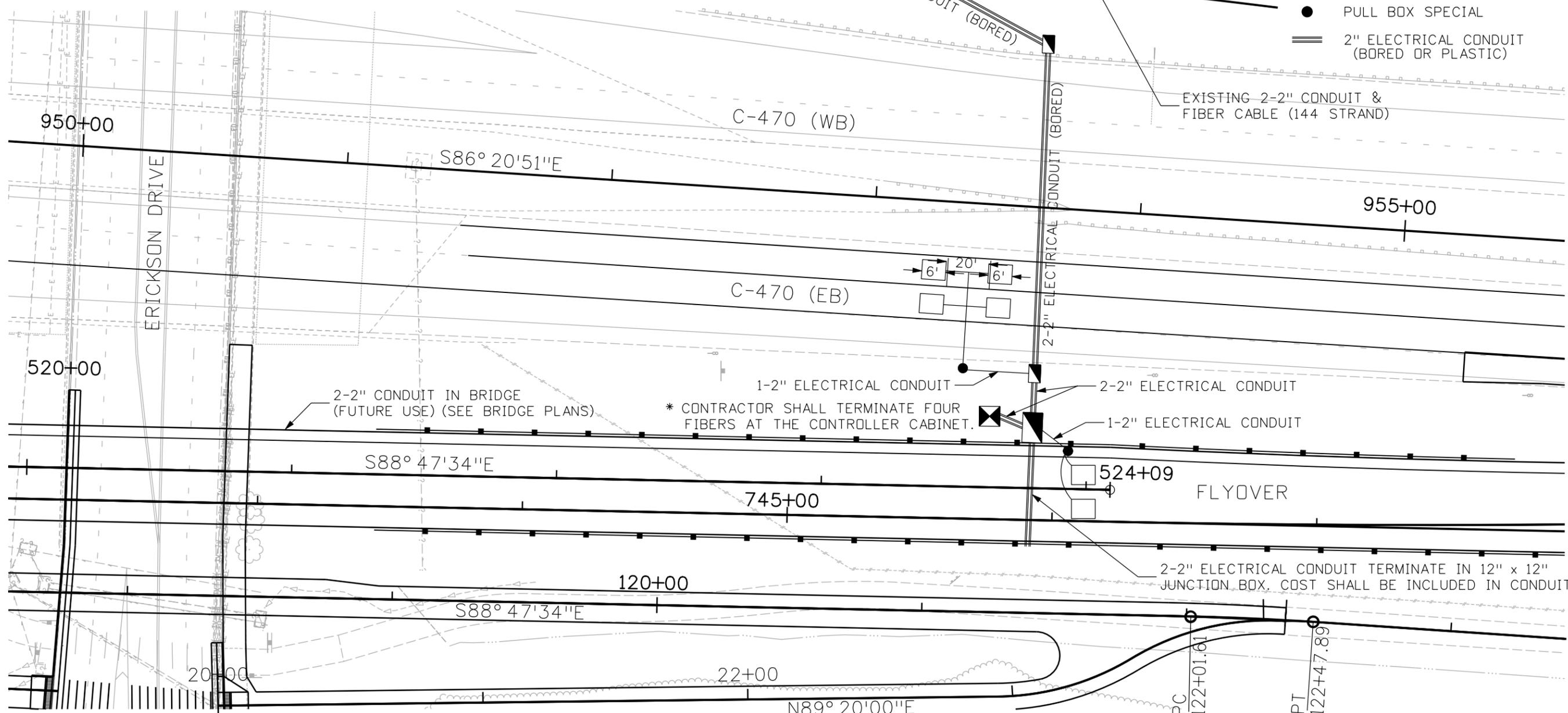
TABULATION OF QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	PROJECT TOTALS
613-00206	2 INCH ELECTRICAL CONDUIT (BORED)	LF	500
613-01200	2 INCH ELECTRICAL CONDUIT (PLASTIC)	LF	230
613-07000	PULL BOX (SPECIAL)	EA	2
613-07040	PULL BOX (30x48x24)	EA	1
614-72875	LOOP DETECTOR WIRE	LF	800
614-72878	TRAFFIC SIGNAL VEHICLE DETECTOR AMPLIFIER (LOOP TYPE) (4 CHANNEL)	EA	2
614-86246	CONTROLLER (TYPE 170E-HC11)	EA	1
614-87011	FIBER OPTIC CABLE (SINGLE MODE) (24 FIBER)	LF	410
614-87020	OPTICAL TRANSCEIVER	EA	1
614-87350	TEST FIBER OPTIC CABLE	LS	0.5



- CONTROLLER CABINET
- PULL BOX (30x48x24)
- PULL BOX (18x12x18)
- PULL BOX SPECIAL
- 2" ELECTRICAL CONDUIT (BORED OR PLASTIC)

EXISTING ITS MANHOLE 20
 * CONTRACTOR SHALL COIL 75 LF OF FIBER OPTIC CABLE (24-FIBER) IN MANHOLE FOR FUTURE SPLICING BY OTHERS.



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Sheet Revisions		
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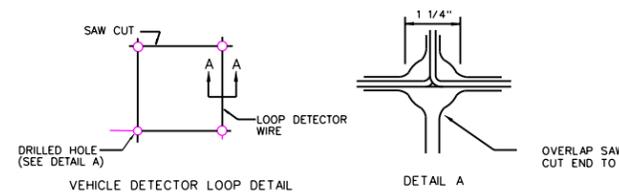
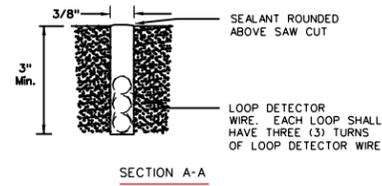
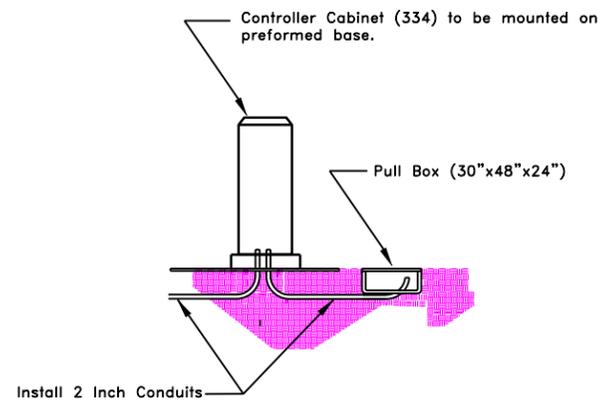
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PROPOSED ATR
 C-470 / SANTA FE FLYOVER
 Designer: FSW
 Detailer: JMB
 Sheet Subset: ITS
 Structure Numbers
 Subset Sheets: 1 of 5

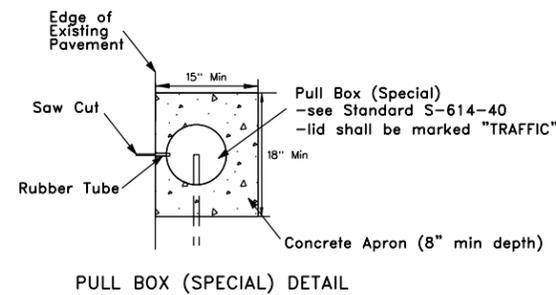
Project No./Code
 ES6 0852-103
 17679
 Sheet Number 311



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VEHICLE DETECTOR LOOP SAW CUT DETAILS
(FOR USE WITH VINYL TUBING ENCLOSED LOOP DETECTOR WIRE)



- All detector loops shall measure as a 6' X 6' square (within 1/2" tolerance).
- All detector loops shall be centered in the traffic lane.
- All detector loop slots shall be cut to a minimum depth of 4"
- Before installation of the wire, all slots shall be cleaned of debris using compressed air or water and the surface of the roadway and slots shall be dried by the use of compressed air.
- All saw cut loops shall include 3 turns of loop detector wire. The wires shall be seated at the bottom of the saw slot.
- No more than four loop detector wires shall be placed in a saw slot leading to the edge of roadway.
- No detector wire splices shall be allowed in the saw slots. All loops shall have continuous detector wiring throughout the pavement.
- All lead-in wire shall be continuous to the controller cabinet.
- All loop and loop lead-in wires shall be clearly labeled in each pull box.
- Prior to the sealing of the saw slots and drill holes, an inductance and leakage test shall be performed. Loop inductance shall measure between 20 and 2500 microhenries. Leakage resistance will be greater than or equal to 100 megohms. Measurements outside of these specifications will be cause for immediate loop replacement.
- Conduit for lead-in wire off the pavement surface shall be buried at a minimum depth of 3'.
- Loop sets (two loops in a series) within a single lane shall be separated by 20' resulting in a distance of 26' from leading edge to leading edge (within 1/2" tolerance)
- For new asphalt surfaces, slots shall be saw cut and detector wire installed prior to laying of the final lift of pavement. For new concrete pavement, preformed loops shall be used, see project plan sheets, project standards and project special provisions.
- All saw cut corners shall be rounded using a 1 1/4" hole saw drilled to a minimum depth of 4". No 45 degree angled corners will be accepted.
- The minimum saw cut slot width shall be 3/8".
- All saw slots and drill holes shall be sealed using an approved loop sealant. Excess sealant shall be removed to avoid unnecessary high spots.
- Pull boxes shall contain an additional 2' of loop detector wire and lead-in wire.
- Some electrical conduit trenches shown on the plan shall contain multiple conduits for the separation of electrical power, loop wire and/or fiber optic cable.
- Power wiring, loop detector wire and fiber optic cable shall be each installed in a separate conduit as shown on the project plans unless otherwise directed by the Engineer.
- 18" X 12" X 18" pull boxes needed to complete conduit installation shall be included in the cost of the conduit.
- Passage detector loops shall be placed as shown on the plans.
- Contractor shall contact Johnny Bland (303) 757-9991 48 hours prior to installing loops and 48 hours prior to terminating loops at each location.
- Loop lead-ins shall run to pull box (special) at the edge of pavement. Concrete apron shall be included in the cost of Pull Box (Special).
- Contractor shall use a 3" strip of backer rod every 3' prior to sealant to ensure that the wire stays at the bottom of the saw cut. The rest of the saw cut shall receive full depth sealant.

LEGEND

- CONTROLLER CABINET
- PULL BOX (30x48x24)
- PULL BOX (SPECIAL)
- PULL BOX (18x12x18) - INCLUDED IN CONDUIT
- 2" CONDUIT (PLASTIC) OR (BORED) AS SHOWN ON PLANS

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File Name: Ramp Metering Standard.dgn
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Engineers & Architects
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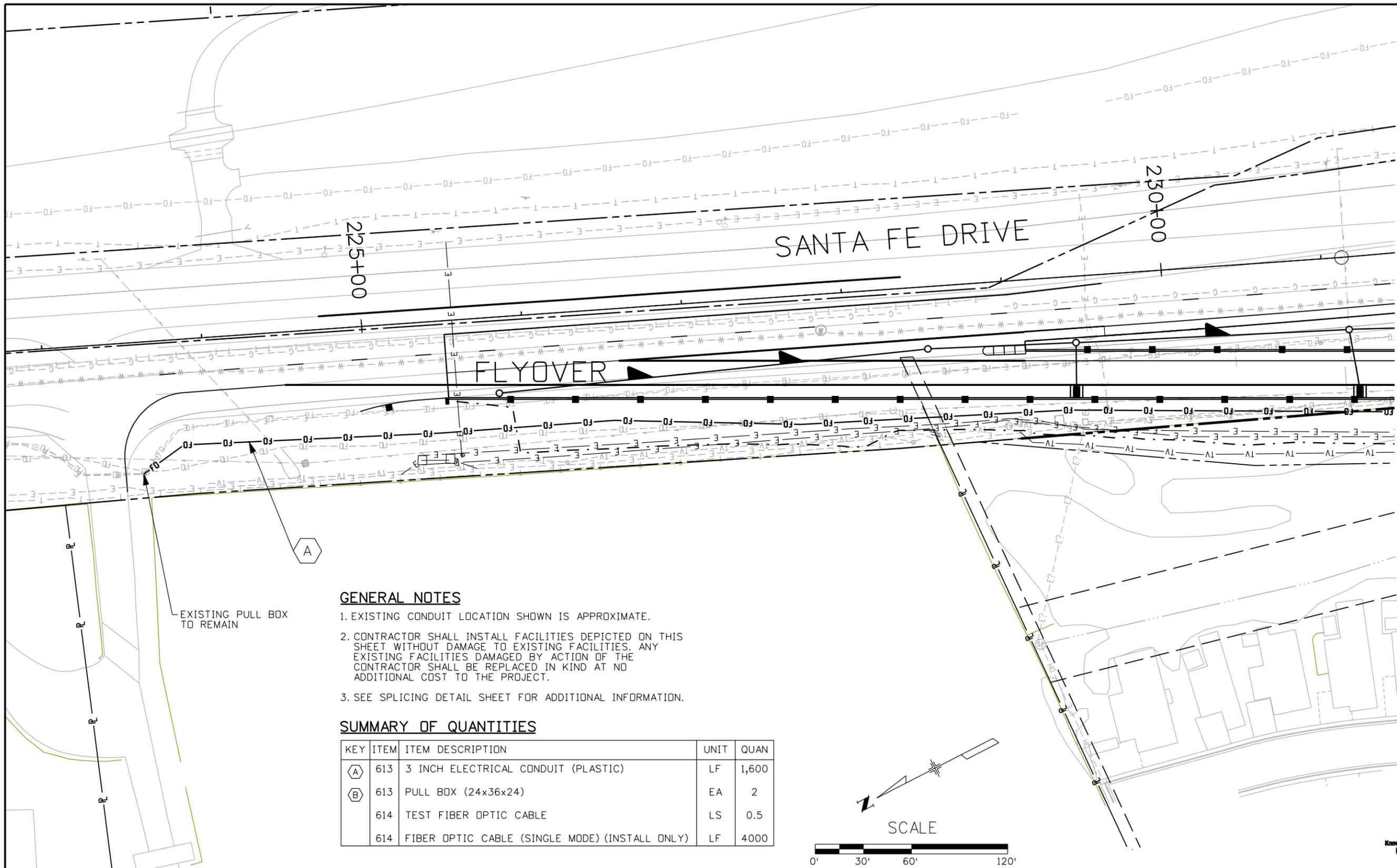
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ATR DETAIL

Designer: **FSW**
Detailer: **JMB**
Sheet Subset: **ITS**
Structure Numbers
Subset Sheets: **2** of **5**

Project No./Code

ES6 0852-103
17679
Sheet Number 312



GENERAL NOTES

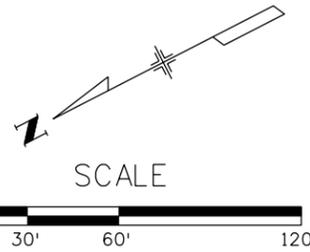
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2. CONTRACTOR SHALL INSTALL FACILITIES DEPICTED ON THIS SHEET WITHOUT DAMAGE TO EXISTING FACILITIES. ANY EXISTING FACILITIES DAMAGED BY ACTION OF THE CONTRACTOR SHALL BE REPLACED IN KIND AT NO ADDITIONAL COST TO THE PROJECT.
3. SEE SPLICING DETAIL SHEET FOR ADDITIONAL INFORMATION.

SUMMARY OF QUANTITIES

KEY	ITEM	ITEM DESCRIPTION	UNIT	QUAN
(A)	613	3 INCH ELECTRICAL CONDUIT (PLASTIC)	LF	1,600
(B)	613	PULL BOX (24x36x24)	EA	2
	614	TEST FIBER OPTIC CABLE	LS	0.5
	614	FIBER OPTIC CABLE (SINGLE MODE) (INSTALL ONLY)	LF	4000

EXISTING PULL BOX TO REMAIN

(A)



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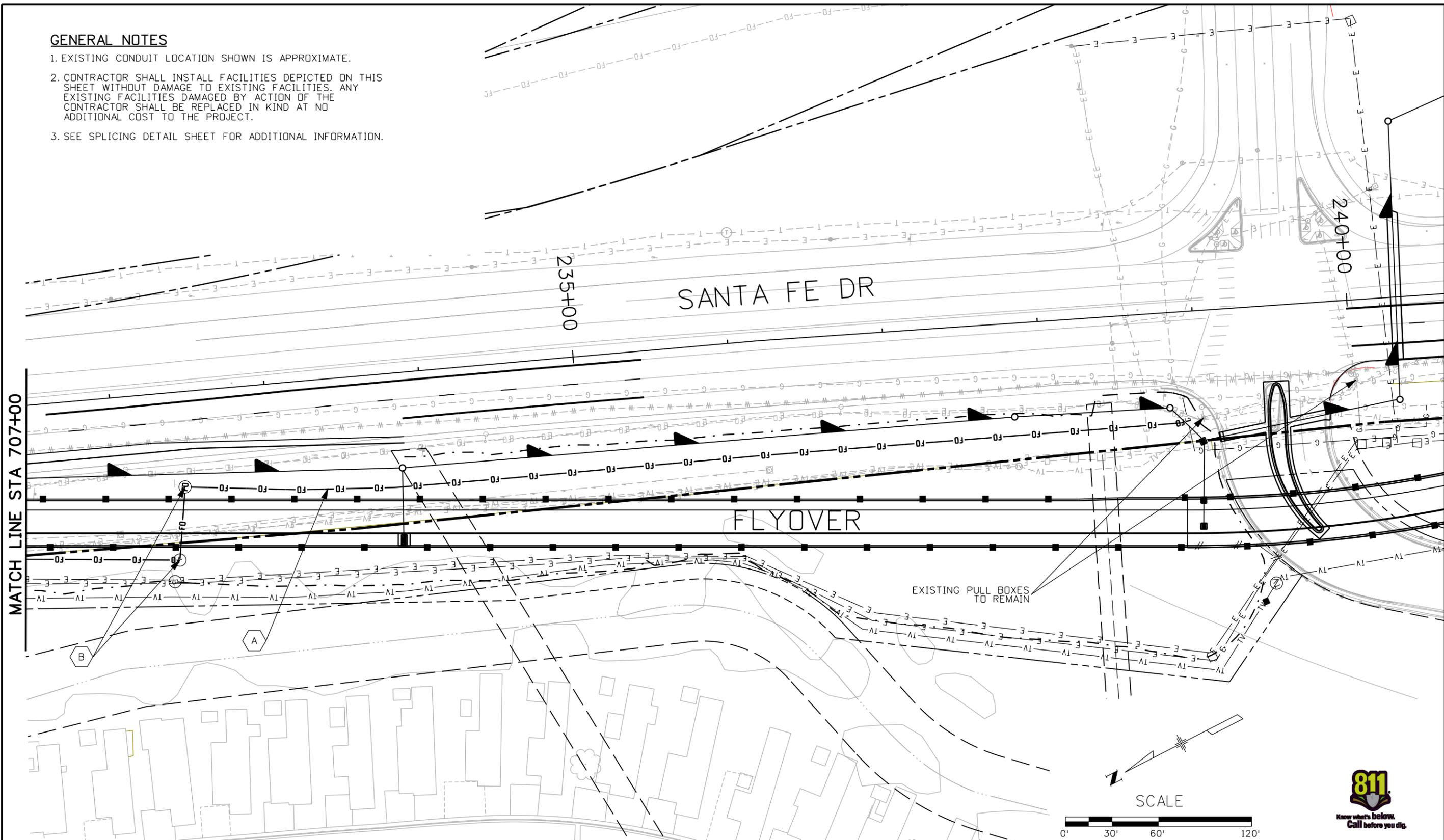
ITS FIBER RELOCATION
 C-470 / SANTA FE FLYOVER

Designer: MPA	Structure Numbers
Detailer: MPA	
Sheet Subset: ITS	Subset Sheets: 3 of 5

Project No./Code	ES6 0852-103
	17679
Sheet Number	313

GENERAL NOTES

1. EXISTING CONDUIT LOCATION SHOWN IS APPROXIMATE.
2. CONTRACTOR SHALL INSTALL FACILITIES DEPICTED ON THIS SHEET WITHOUT DAMAGE TO EXISTING FACILITIES. ANY EXISTING FACILITIES DAMAGED BY ACTION OF THE CONTRACTOR SHALL BE REPLACED IN KIND AT NO ADDITIONAL COST TO THE PROJECT.
3. SEE SPLICING DETAIL SHEET FOR ADDITIONAL INFORMATION.



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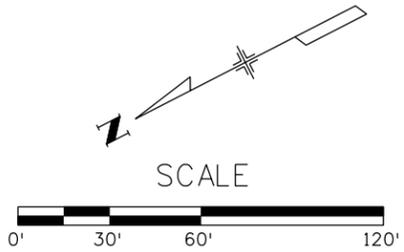
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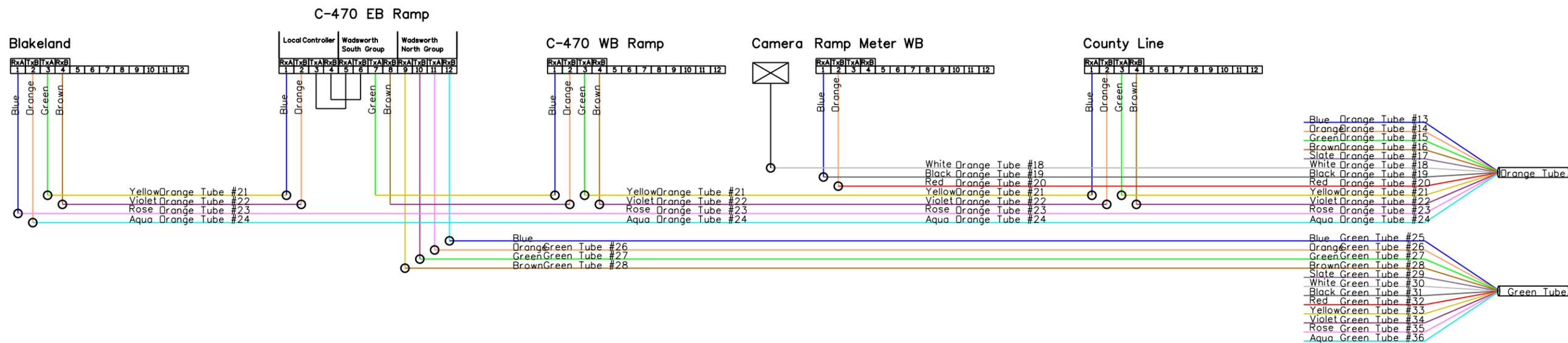
ITS FIBER RELOCATION
 C-470 / SANTA FE FLYOVER
 Designer: MPA
 Detailer: MPA
 Sheet Subset: ITS
 Structure Numbers
 Subset Sheets: 4 of 5

Project No./Code
 ES6 0852-103
 17679
 Sheet Number 314

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To Littleton City Offices

- UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL SUBMIT RECORD DRAWINGS, "AS-CONSTRUCTED" PLANS TO CDOT, SHOWING THE ACTUAL LOCATION OF THE CONDUIT, PULL BOXES, AND OTHER SIGNIFICANT WORK ITEMS AT NO ADDITIONAL COST TO THE PROJECT.
- A LOCATING WIRE (SINGLE STRAND 12 AWG INSULATED) AND A PULL TAPE SHALL BE PLACED IN ALL NEW CONDUIT INSTALLATIONS. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE FOR CONDUIT AND WILL NOT BE PAID SEPARATELY.
- ALL BACKBONE FIBERS SHALL BE TESTED PRIOR TO ANY FIBER WORK. FOR TESTING OF THE BLUE AND BROWN TUBES, CONTACT TIM WEAVER AT 303-795-3867 FOR MORE INFORMATION. ALL FIBERS IN THE ORANGE AND GREEN TUBES SHALL BE TESTED FROM BLAKELAND TO THE LITTLETON CIVIC CENTER.
- CONTACT TIM WEAVER AT 303-795-3867 TO ACCESS THE FIBERS FOR TESTING IN THE LITTLETON CIVIC CENTER.
- ALL BACKBONE FIBER SHALL BE PULLED BACK FROM BLAKELAND TO THE PULL BOX LOCATED AT APPROXIMATE STA 224+00 AS SHOWN IN THE PLANS. FEED FIBER OPTIC LINE BACK INTO NEW CONDUIT. THE WORK SHALL BE MEASURED AND PAID FOR AS FIBER OPTIC CABLE (SINGLE MODE) (INSTALL ONLY) 4000 LF
- ALL FIBERS SHALL BE TESTED IN ACCORDANCE TO THE FIBER TESTING SPECIFICATION.
- THE CONTRACTOR SHALL RESET ALL CONNECTORS, ADAPTERS, JUMPERS, PIGTAILS, AND ANCILLARY HARDWARE TO ACCOMPLISH RECONNECTION OF THE LATERAL FIBERS TO THE FIBER BACKBONE.
- THE CONTRACTOR SHALL MAINTAIN A 25 FOOT LATERAL COIL IN THE EXISTING PULL BOX AT THE BASE OF THE CONTROLLERS AND A 10 FOOT COIL IN THE CABINET. A 20 FOOT MINIMUM COIL OF THE BACKBONE SHALL BE MAINTAINED IN ALL PULL BOXES.
- SPLICE 12 STRAND FIBER AS SHOWN IN SPLICING DIAGRAM. RETEST ALL BACK BONE FIBERS AS DESCRIBED IN NOTE 3.

DRAWING NOT TO SCALE

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File Name: 14679_ITSplicingdiagram.dgn
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ITS FIBER SPLICING DETAIL	
C-470 / SANTA FE FLYOVER	
Designer: TB	Structure Numbers
Detailer: TB	
Sheet Subset: ITS	Subset Sheets: 5 of 5

Project No./Code
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Sheet Number 315

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