

# PW1326 - KU / CITY FIBER INSTALLATION IN VERIZON CONDUIT

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### UTILITY CONTACT INFORMATION:

CITY OF LAWRENCE PUBLIC WORKS  
 6 EAST 6TH STREET  
 LAWRENCE, KANSAS 66044  
 PHONE: (785) 832-3130  
 FAX: (785) 832-3398  
 DAVID P. CRONIN  
 dcronin@lawrenceks.org

CITY OF LAWRENCE FORESTRY  
 1110 HASKELL AVE  
 LAWRENCE, KANSAS 66044  
 PHONE: (785) 832-7970  
 FAX: (785) 832-7972  
 CRYSTAL MILES  
 cmiles@lawrenceks.org

CITY OF LAWRENCE DEPARTMENT OF UTILITIES  
 720 WEST 3RD STREET  
 LAWRENCE, KANSAS 66044  
 PHONE: (785) 832-7880  
 FAX: (785) 832-7897  
 JOHN SHUTAK  
 jshutak@lawrenceks.org

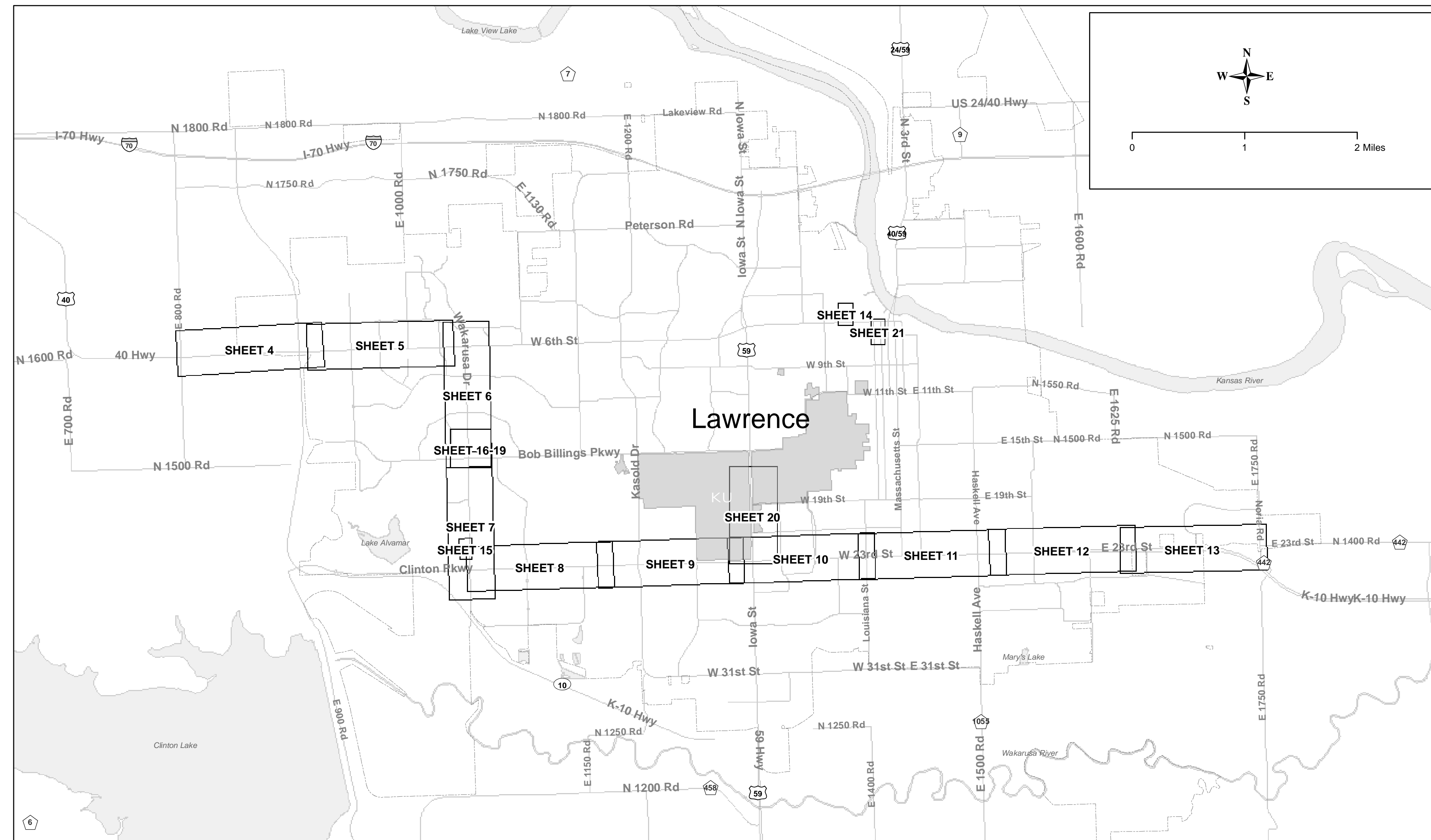
BLACK HILLS ENERGY  
 110 EAST 9TH STREET  
 LAWRENCE, KANSAS 66044  
 PHONE: (785) 832-3943  
 FAX: (785) 832-3950

WOW!  
 TOMMY JOHNSON  
 tommy.johnson@blackhillscrop.com  
 1 RIVERFRONT PLAZA, SUITE 301  
 LAWRENCE, KANSAS 66044  
 PHONE: (785) 312-6922  
 FAX: (785) 312-6940  
 JAMES WAYMIRE  
 james.waymire@knology.com

WESTAR ENERGY  
 7 46 EAST 27TH STREET  
 LAWRENCE, KANSAS 66046  
 PHONE: (785) 865-4850  
 FAX: (785) 865-4874  
 MIKE SOLIDA  
 mike.solida@westarenergy.com

AT&T  
 220 SE 6TH AVENUE, ROOM 360  
 TOPEKA, KANSAS 66603  
 PHONE: (785) 276-5377  
 FAX: (785) 276-6487  
 KEITH GATZEMEYER  
 kg4306@att.com

KANSAS ONE CALL  
 1-800-DIG-SAFE  
 1-800-344-7233



Revised: 7/22/2013 by msebold

SHEET 1 of 29



**KU / City of Lawrence Fiber Project**  
 Cover Sheet  
 Project No. PW1326

**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER

**General Notes**

1. The contractor shall mark I stake the locations of all pull boxes and CCTV poles. These locations shall be approved by City Traffic Engineer or Construction Inspector prior to placement of equipment.

2. The locations of existing utilities are approximate. The contractor shall be responsible for contacting utility companies and the City to determine the exact location and depth of all existing utilities before actual construction, and be fully responsible for any and all damage caused by the contractor's failure to exactly locate and preserve all utilities. Call 1-800-DIG-SAFE.

3. The location of new pull boxes and conduit runs are typical only and shall be adjusted during installation to clear any obstructions and facilitate wiring, as approved by a City Traffic Engineer or Construction Inspector.

4. Pull boxes shall not be installed on sidewalk ramps.

5. All existing pull boxes shall be reset to grade level unless the Traffic Engineer or City Inspector approves the grade.

6. Any pavement, curb, sidewalk, etc disturbed during construction shall be replaced and repaired with materials approved by the City at no additional cost.

7. Quantities calculated are an estimate only, and are not guaranteed to be complete. Contractor assumes all responsibility to provide all material necessary to complete the work.

8. Fifty (50) feet of fiber shall be coiled in each fiber pull box unless designated otherwise in the plans.

9. The contractor shall be responsible for traffic control for this project. Traffic control shall follow the latest Manual on Uniform Traffic Control Devices (MUTCD), Kansas Department of Transportation (KDOT) or City of Lawrence traffic control standards. During construction the contractor shall avoid disruption to public streets if at all possible, which includes closures. Lane closures should be used if absolutely needed and should occur during non-peak hours of traffic.

10. The contractor shall notify the City Forestry Manager if any open trenching, bore pits or overhead lines are being installed withing 10' of existing trees in R/W or on City property. Call 785-832-7970

Item	DESCRIPTION	UNITS	QTY
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 2" HDPE Conduit	LF	170
4	Install - 288 Count FO Cable	LF	64,750
5	Install - 6 Count Gator Patch ITS Drop Cable	Each	3
6	Supply & Install - Hand hole	Each	6
7	Install - Splice cabinet	Each	3
8	Install - Splice enclosure	Each	4
9	Supply & Install - Fiber Splices	Each	864
10	Install - CCTV Camera Assembly	Each	2
11	Install - CCTV Cable	LF	300
12	Supply & Install 15A breaker in Signal cabinet & wiring to splice cable	LS	1
13	CSH05U splice housing	Each	1
14	M-67-112 splice tray	Each	12
15	Breakout Kit SC Connector	Each	4

Equipment Supplied by City			
Item	DESCRIPTION	UNITS	QTY
1	Install - 288 Count FO Cable	LF	64,750
2	Install - 6 Count Gator Patch with 175' ITS Drop Cable	Each	3
3	Install - Splice cabinet	Each	3
4	Install - Splice enclosure	Each	5
5	Install - CCTV Camera Assembly	Each	2
6	Install - CCTV Cable	LF	300



<b>Alternative Bid #1: (City) (Sheet #15) Clinton Water Treat Plant</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 2" HDPE Conduit from existing pull-box to new box	LF	470
4	Supply & Install - 24 Count FO Cable	LF	1,000
5	Supply & Install - Fiber Optic Pull Box entering Plant, 36x24x36	Each	1
6	Supply & Install - Fiber to demarc area, Clinton Plant, 2nd Floor	Each	1
7	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	6
8	Supply & Install - Fiber Splices at demarc	Each	6
9	Test- OLTS and OTDR test per bid requirements	Each	24

<b>Alternative Bid #4: (KU) (Sheet #17) KU Life Science Research Laboratory</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 2" HDPE Conduit hand-hole on SW Corner to ITC	LF	440
4	Supply & Install - Hand-hole, 36x24x36 in front of Building A	1	Each
5	Supply & Install - 2" HDPE Conduit from hand hole directly into Bldg /	LF	80
6	Supply & Install - 24 Count FO Cable	LF	840
7	Supply & Install - Fiber to demarc inside building	Each	1
8	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	24
9	Supply & Install - Fiber Splices at demarc splice tray (supplied)	Each	24
10	Test- OLTS and OTDR test from KU Ellsworth Annex to LSRL Bldg. A	Each	24

<b>Alternative Bid #7: (KU) (Sheet #20) 23rd &amp; Iowa to KU's Ellsworth Hall</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 4" HDPE Conduit from existing pull-box to new box	LF	1,275
4	Supply & Install - 192 Count FO Cable	LF	5,300
5	Supply & Install - Two (2) 4" 3-Cell Maxell Innerduct	Each	2
6	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	96
7	Supply & Install - Fiber Splices at demarc splice tray (supplied)	Each	96
8	Test - OLTS and OTDR test per bid specs	Each	192

<b>Alternative Bid #2: (City) (Sheet #15) Fire Station #4</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 2" HDPE Conduit from existing pull-box to new box	LF	120
4	Supply & Install - 24 Count FO Cable	LF	700
5	Supply & Install - Fiber Optic Pull Box Fire Station #4 Bldg, 36x24x36	Each	1
6	Supply & Install - Fiber to demarc area as noted for Fire Station #4	Each	1
7	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	4
8	Supply & Install - Fiber Splices at demarc (existing wall rack)	Each	4
9	Test- OLTS and OTDR test per bid requirements	Each	24

<b>Alternative Bid #5: (KU) (Sheet #18) KU Wakarusa Research Facility</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
1	Supply & Install - 2" HDPE Conduit, hand-hole on SW Corner to Bldg.	LF	1,250
2	Supply & Install - Hand-hole, 36x24x36 in front of Building	Each	1
3	Supply & Install - 2" HDPE Conduit, hand hole in front into box by Bldg.	LF	170
4	Supply & Install - 24 Count FO Cable from SE Corner to WRF	LF	1,900
5	Supply & Install - Hand-hole, 36x24x36 on North side of Building	Each	1
6	Supply & Install - Fiber to Wakarusa Research Facility demarc	LS	1
7	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	24
8	Supply & Install - Fiber Splices at demarc splice tray (supplied)	Each	24
9	Test - OLTS and OTDR test from KU Ellsworth Annex to SLRL Building A	Each	24

<b>Alternative Bid #8: (City) (Sheet #21) Library Area Project</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - Hand-Hole Box #1, 36x24x36, SW Corner 6th/KY	Each	1
4	Install splice case, performing mid-sheath entry at 6 <sup>th</sup> & Kentucky	Each	1
5	Supply & Install - Fiber Splices at pullbox at 6th & Kentucky	Each	16
6	Supply & Install - 2" HDPE Conduit from 6th/KY to 7th/KY.	LF	700
7	Supply & Install - Hand-Hole Box #2, 36x24x36 at SW Corner 7th/KY	Each	1
8	Supply & Install - 2" HDPE Conduit from 7th/KY to mid-block	LF	210
9	Supply & Install - Hand-Hole Box, #3, 36x24x36 mid-block on Kentucky	Each	1
10	Supply & Install - 2" HDPE Conduit from mid-block 7th into Outdoor Pool I	LF	200
11	Supply & Install - 2" HDPE Conduit from mid-block to East side of KY	LF	90
12	Supply & Install - Hand-Hole Box, #4, 36x24x36 mid-block East side of KY	Each	1
13	Supply & Install - 48 Count FO Cable from 6th & KY to mid-block 7th	LF	1,000
14	Install - Fiber Splice Case at west side of 7th in mid-block Hand-Hole	Each	1
15	Supply & Install - Fiber Splices at pullbox at west side of 7th mid block	Each	4
16	Install - 290ft 6 Count Gator Patch from Mid-Block-Pool demarc	LF	1
17	Test - OLTS and OTDR test from City Hall to Outdoor Pool Building	Each	48

<b>Alternative Bid #3: (City) (Sheet #16) Police Investigation &amp; Training Center</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 2" HDPE Conduit from NE pull-box to box at ITC	LF	690
4	Supply & Install - 24 Count FO Cable	LF	1,000
5	Supply & Install - Fiber Optic Pull Box entering ITC Bldg; 36x24x36	Each	1
6	Supply & Install - Fiber to demarc in rack/ITC Building LL, Rm# 116	Each	1
7	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	4
8	Supply & Install - Fiber Splices at demarc	Each	4
9	Test- OLTS and OTDR test per bid requirements	Each	24

<b>Alternative Bid #6: (CITY) (Sheet #19) Bioscience Tech. Business Center</b>			
Item	DESCRIPTION	Unit	Qty
1	Mobilization	LS	1
2	Supply & Install - Temporary Traffic Control	LS	1
3	Supply & Install - 2" HDPE Conduit from KU LSRL pull-box to new box	LF	250
4	Supply & Install - Hand-Hole Box, 36x24x36	Each	1
5	Supply & Install - 2" HDPE Conduit from pull-box into front of BTBC Bldg	LF	215
6	Supply & Install - 24 Count FO Cable	LF	1,400
7	Supply & Install - Fiber to demarc	Each	1
8	Supply & Install - Fiber Splices at existing pull-box on Wakarusa	Each	6
9	Supply & Install - Fiber Splices at demarc	Each	6
10	Test - OLTS and OTDR test per bid requirements to 23 <sup>rd</sup> & Iowa	Each	24

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**KU / City of Lawrence Fiber Project**  
Alternate Bid Quantities  
Project No. PW1326

**DAVID P. CRONIN, P.E.**  
CITY ENGINEER

**DAVID L. CORLISS**  
CITY MANAGER

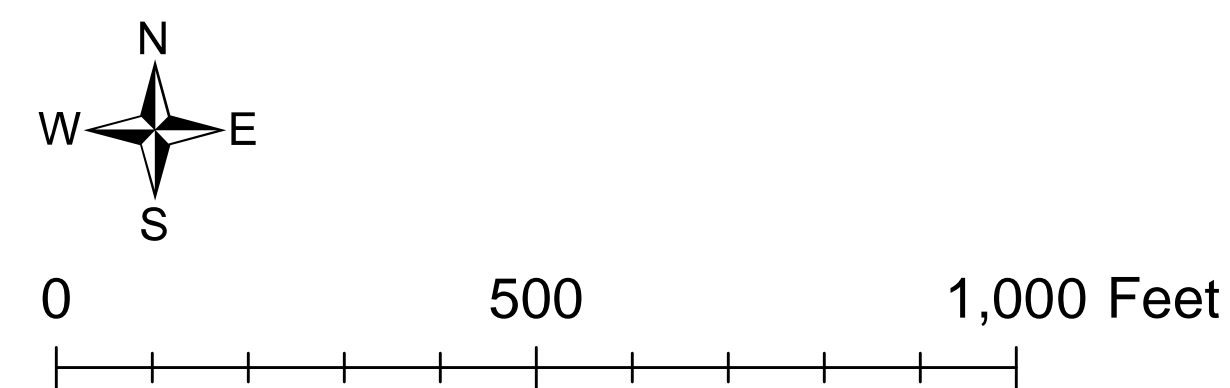
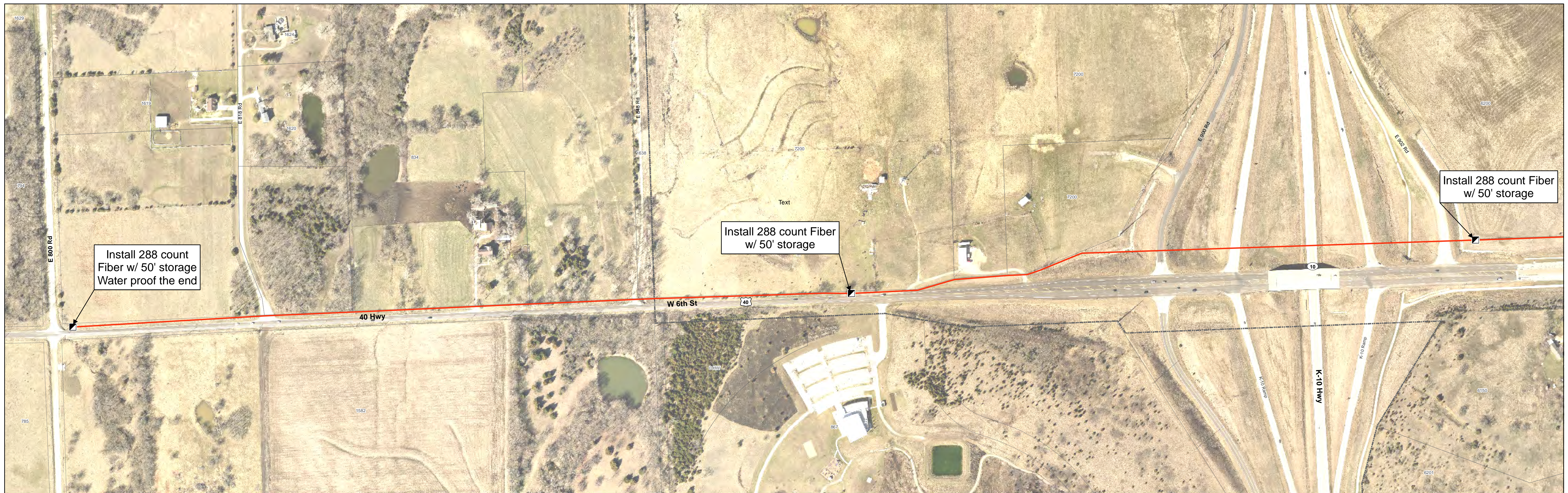
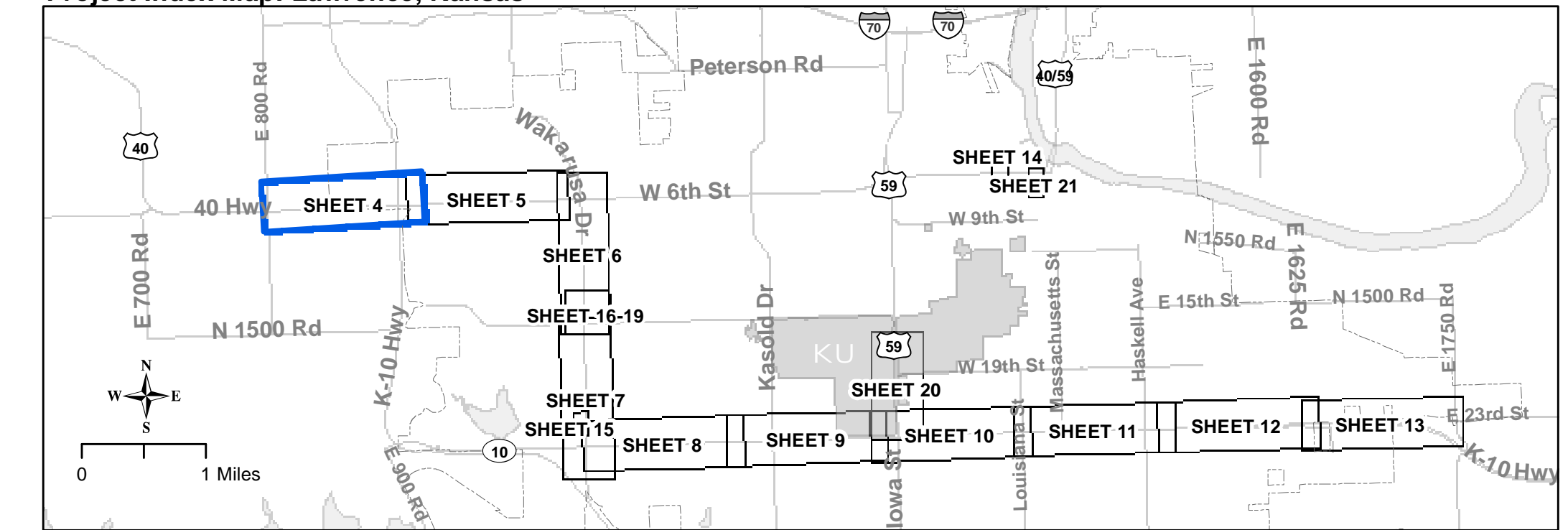


# PW1326 -- KU / City of Lawrence Fiber Project

## SHEET 4

### W 6th Street - E 800 Road to K-10 Highway

Project Index Map: Lawrence, Kansas



Legend					
	Splice Cabinet		CCTV Camera		Parcels
	New Handhole		Project Conduit		City Limit - Lawrence
	Ex. Handhole				

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<b>KU / City of Lawrence Fiber Project</b> W 6th Street - E 800 Road to K-10 Highway Project No. PW1326	
<b>DAVID P. CRONIN, P.E.</b> <small>CITY ENGINEER</small>	<b>DAVID L. CORLISS</b> <small>CITY MANAGER</small>

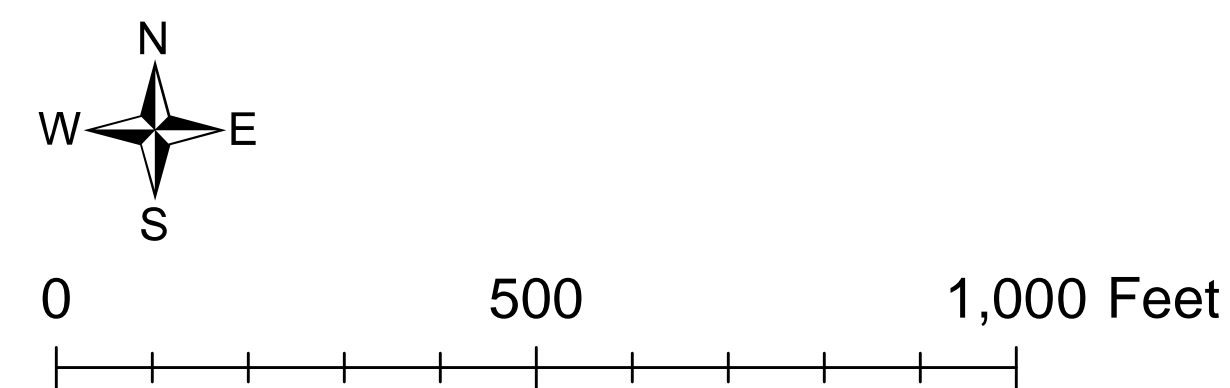
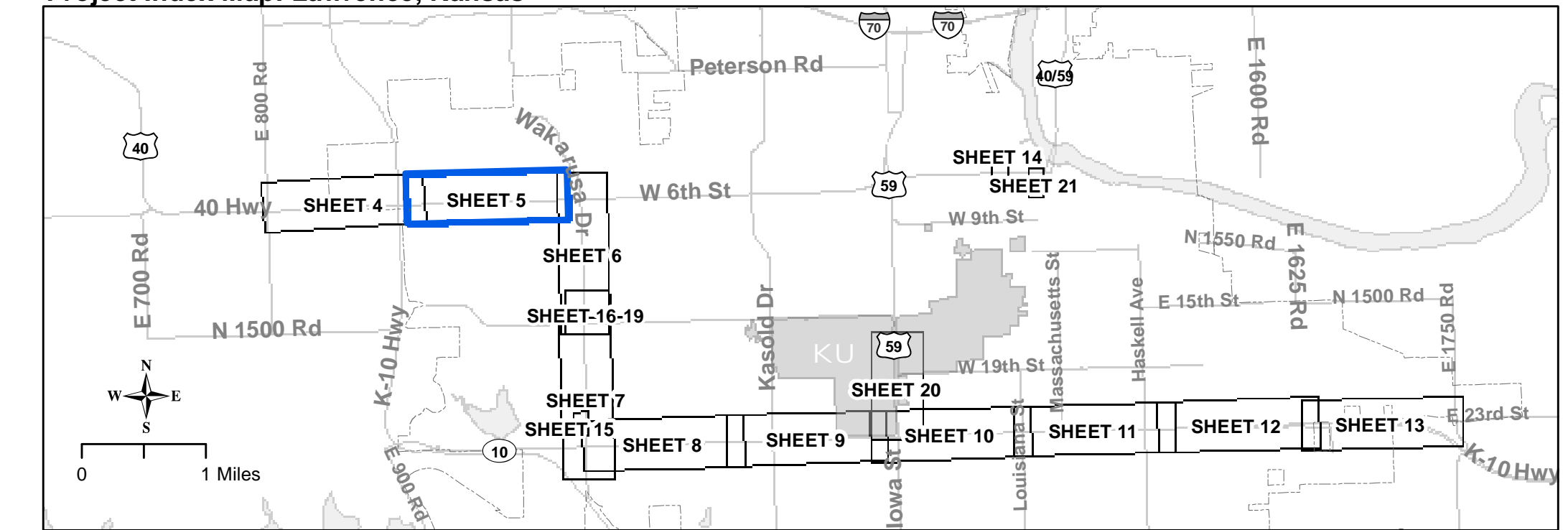


# PW1326 -- KU / City of Lawrence Fiber Project


## SHEET 5

### W 6th Street - E 902 Road to Congressional Drive

Project Index Map: Lawrence, Kansas



Legend					
☒	Splice Cabinet	+	CCTV Camera	□	Parcels
☐	New Handhole	—	Project Conduit		
▣	Ex. Handhole	---	City Limit - Lawrence		

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<b>KU / City of Lawrence Fiber Project</b> W 6th Street - E 902 Road to Congressional Drive Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

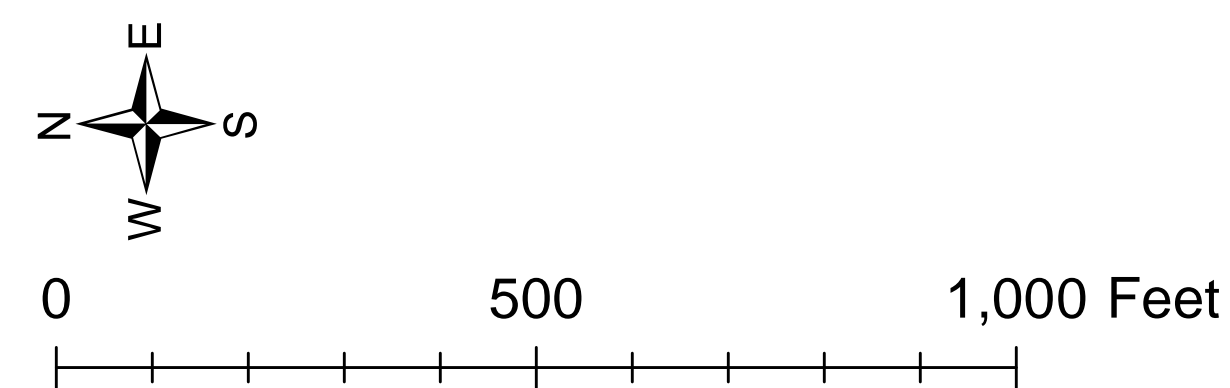
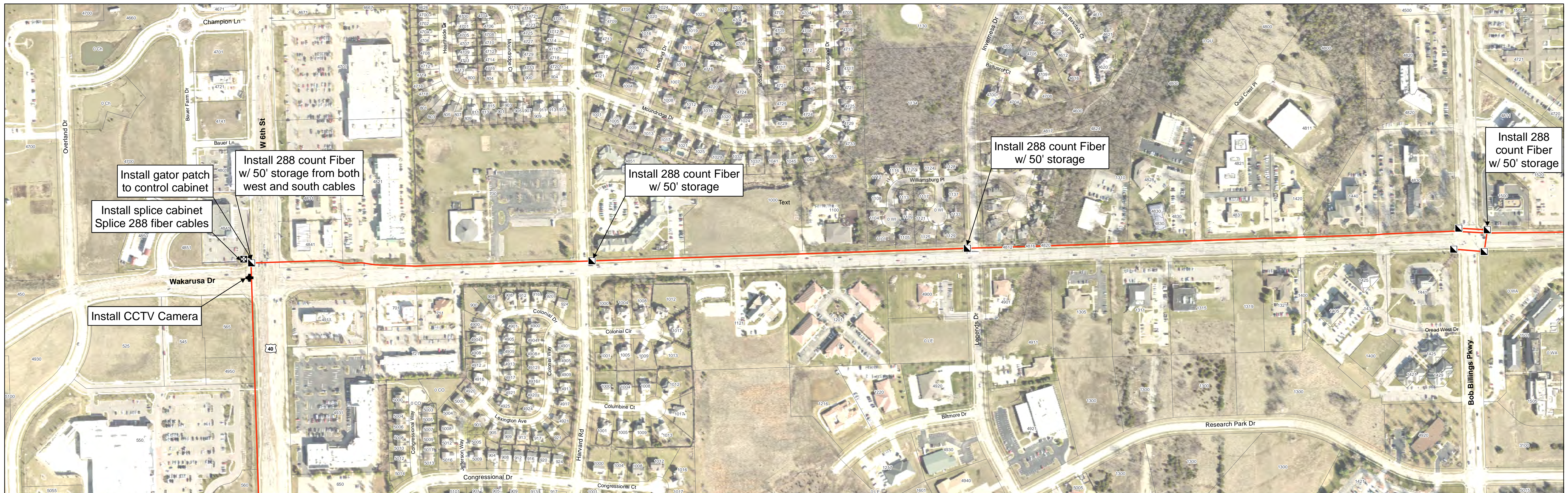
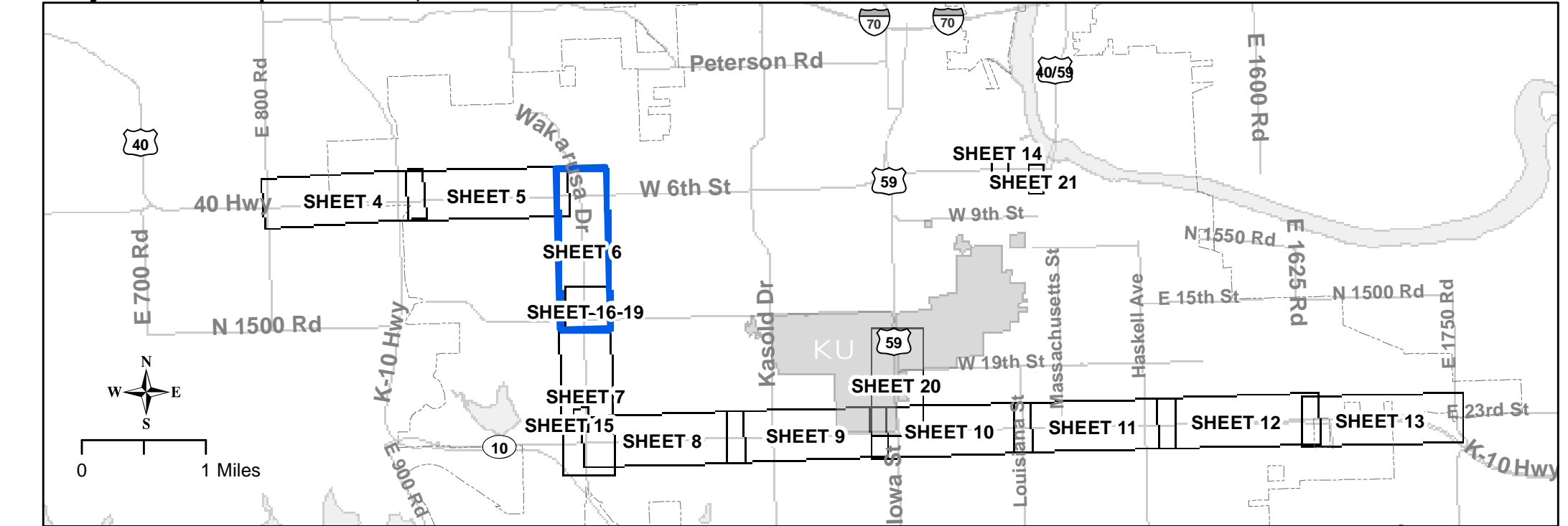


# PW1326 -- KU / City of Lawrence Fiber Project

## SHEET 6

### Wakarusa Drive - W 6th Street to Bob Billings Parkway

Project Index Map: Lawrence, Kansas



Legend					
	Splice Cabinet		CCTV Camera		Parcels
	New Handhole		Project Conduit		
	Ex. Handhole		City Limit - Lawrence		

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<b>KU / City of Lawrence Fiber Project</b> Wakarusa Drive - W 6th Street to Bob Billings Parkway Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

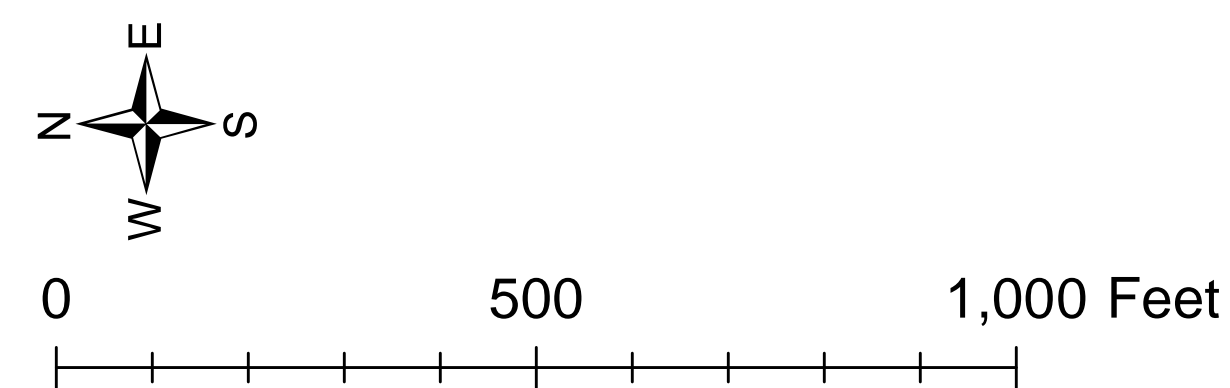
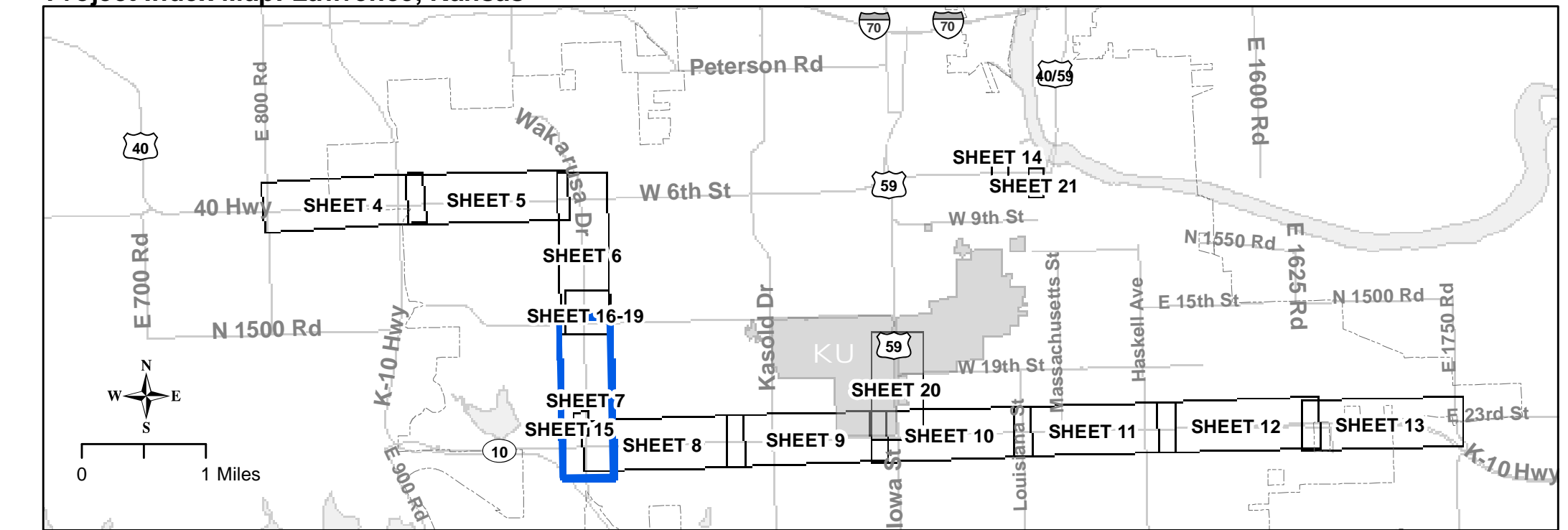


# PW1326 -- KU / City of Lawrence Fiber Project

## SHEET 7

### Wakarusa Drive - Bob Billings Parkway to Clinton Parkway

Project Index Map: Lawrence, Kansas



Legend					
	Splice Cabinet		CCTV Camera		Parcels
	New Handhole		Project Conduit		
	Ex. Handhole		City Limit - Lawrence		

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<b>KU / City of Lawrence Fiber Project</b> Wakarusa Drive - Bob Billings Parkway to Clinton Parkway Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

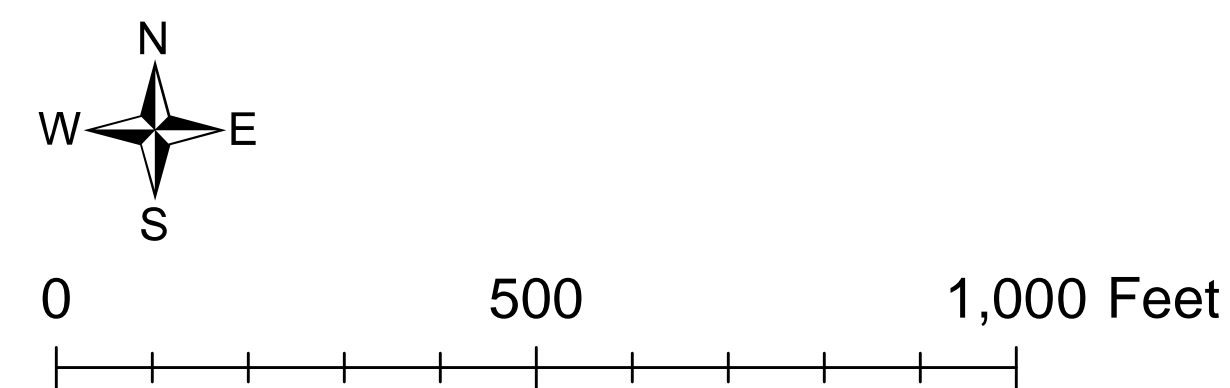
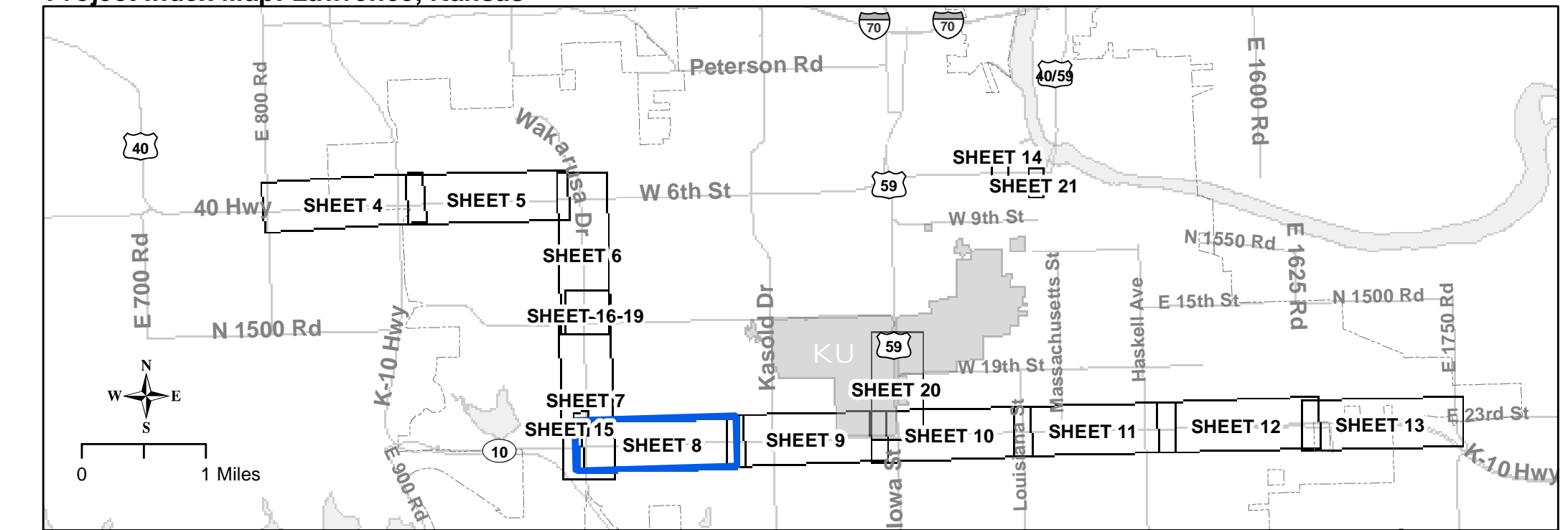


# PW1326 -- KU / City of Lawrence Fiber Project

**SHEET 8**

**Clinton Parkway - Wakarusa to Hartford Avenue**

Project Index Map: Lawrence, Kansas



Legend					
⊠	Splice Cabinet	+	CCTV Camera	▭	Parcels
⊠	New Handhole	—	Project Conduit		
⊠	Ex. Handhole	---	City Limit - Lawrence		

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<p><b>KU / City of Lawrence Fiber Project</b>                  Clinton Parkway - Wakarusa to Hartford Avenue                  Project No. PW1326</p>	
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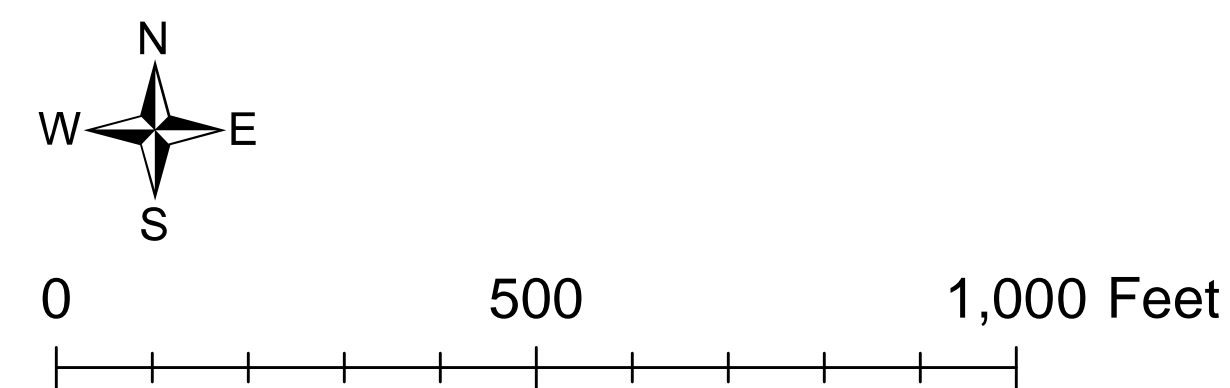
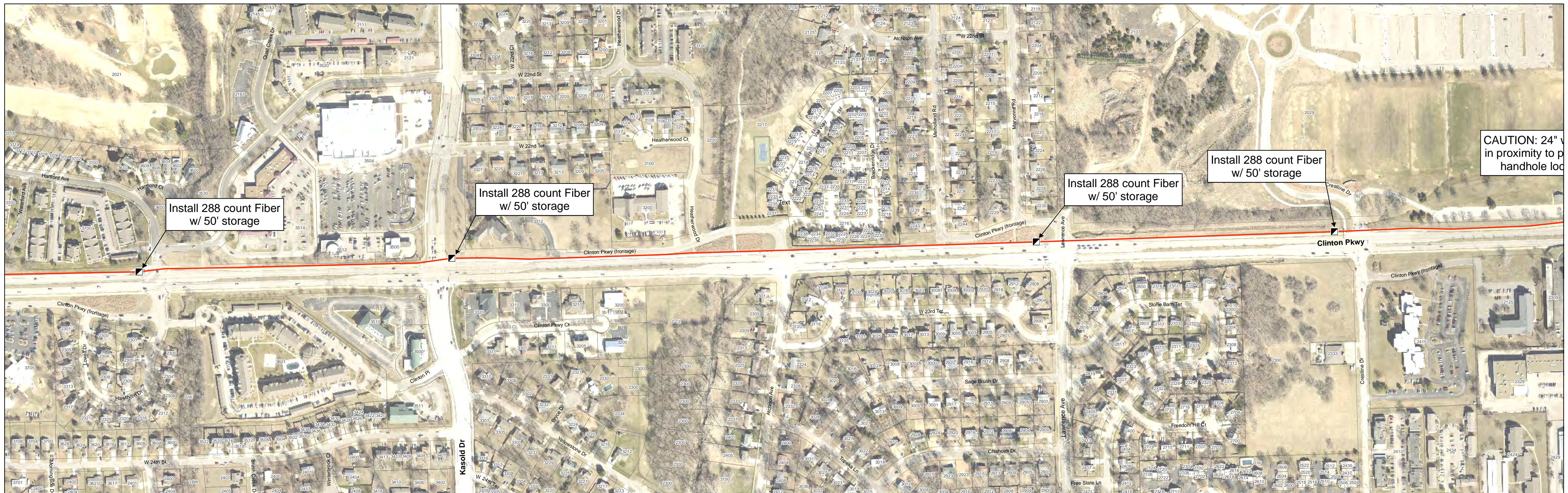
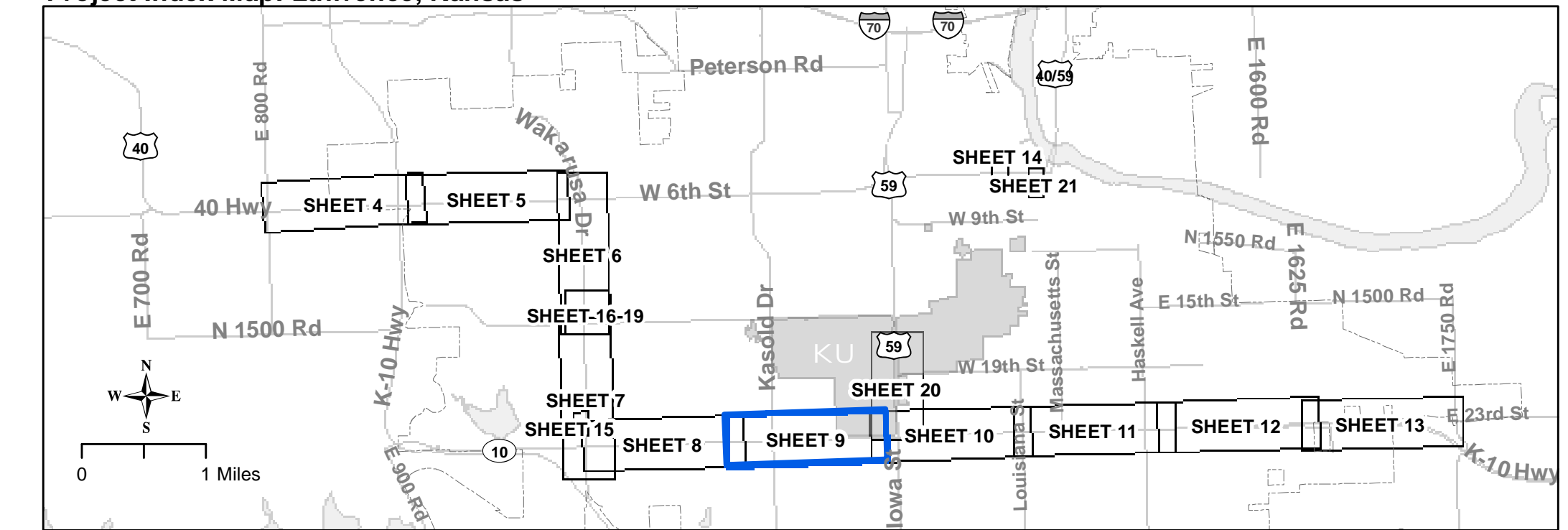


# PW1326 -- KU / City of Lawrence Fiber Project

## SHEET 9

### Clinton Parkway - Hartford Avenue to Crestline Drive

Project Index Map: Lawrence, Kansas



Legend					
	Splice Cabinet		CCTV Camera		Parcels
	New Handhole		Project Conduit		City Limit - Lawrence
	Ex. Handhole				

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<b>KU / City of Lawrence Fiber Project</b> Clinton Parkway - Hartford Avenue to Crestline Drive Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

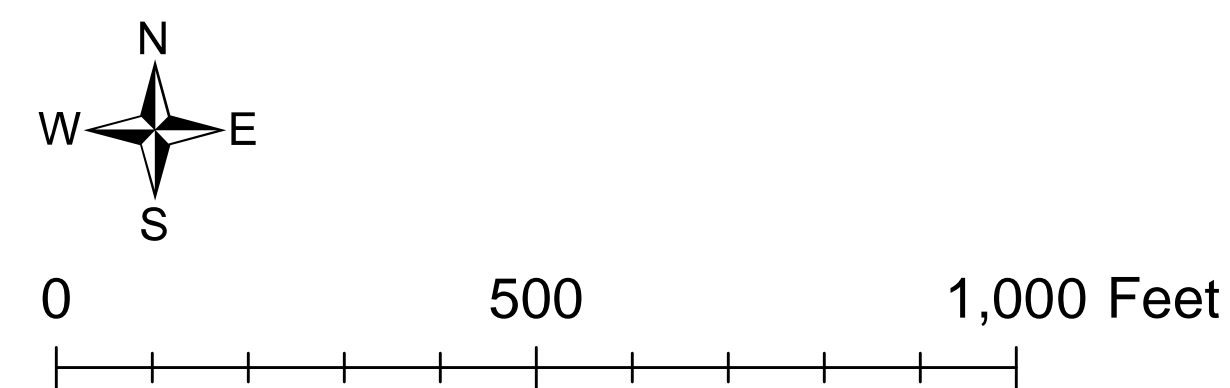
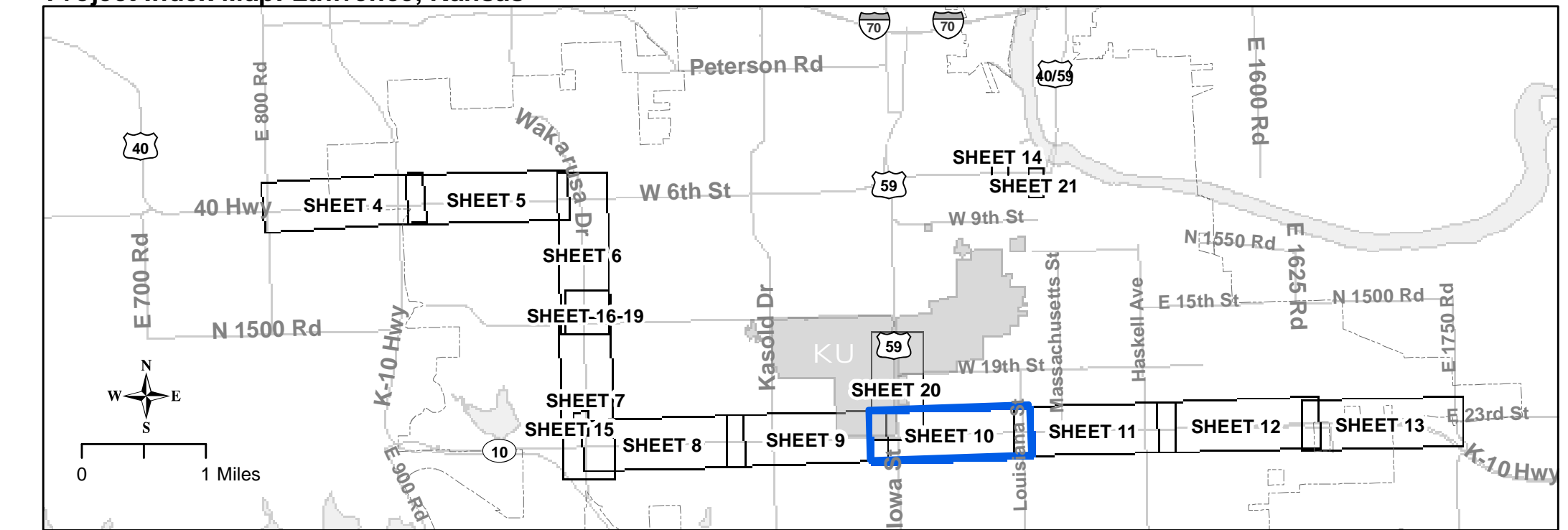


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 10

W 23rd Street - Iowa Street to Louisiana Street

Project Index Map: Lawrence, Kansas



Legend					
	Splice Cabinet		CCTV Camera		Parcels
	New Handhole		Project Conduit		
	Ex. Handhole		City Limit - Lawrence		

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<b>KU / City of Lawrence Fiber Project</b> W 23rd Street - Iowa Street to Louisiana Street Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

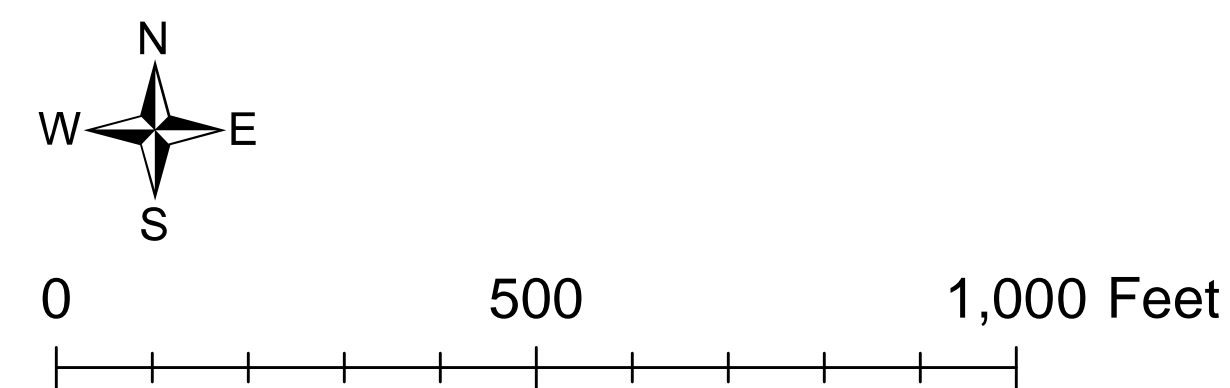
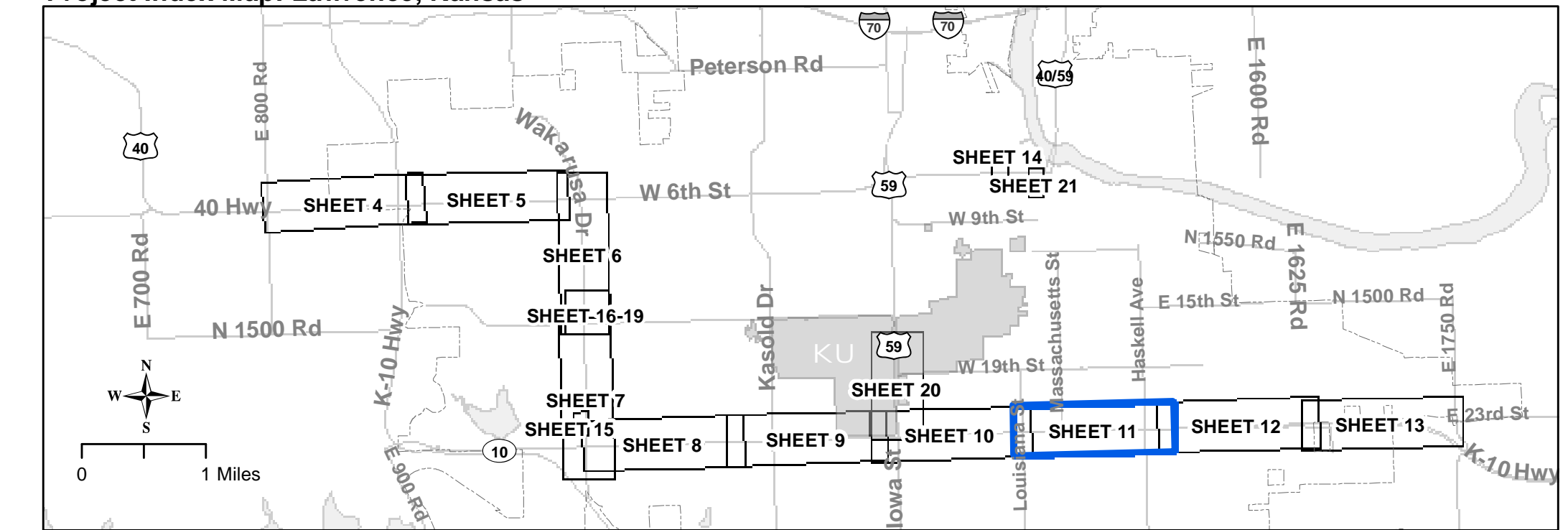


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 11

W 23rd Street - Louisiana Street to Haskell Avenue

Project Index Map: Lawrence, Kansas



Legend					
	Splice Cabinet		CCTV Camera		Parcels
	New Handhole		Project Conduit		City Limit - Lawrence
	Ex. Handhole				

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<b>KU / City of Lawrence Fiber Project</b> W 23rd Street - Louisiana Street to Haskell Avenue Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

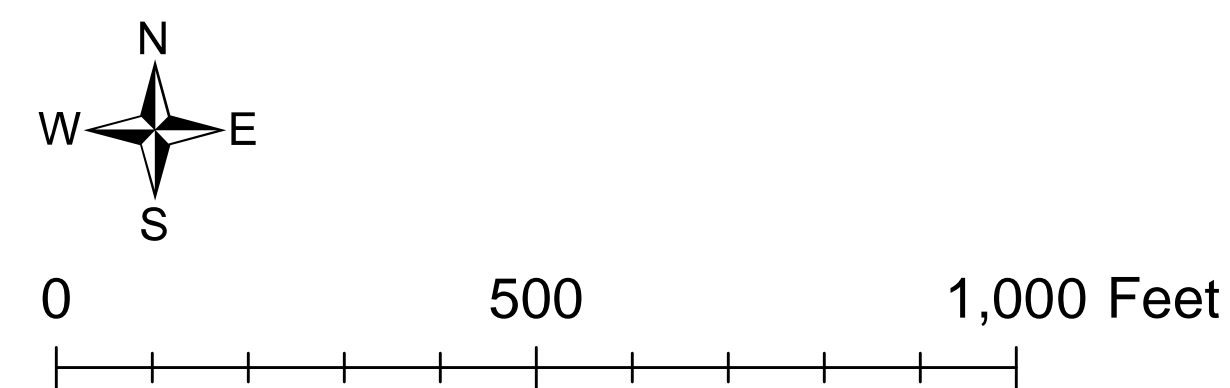
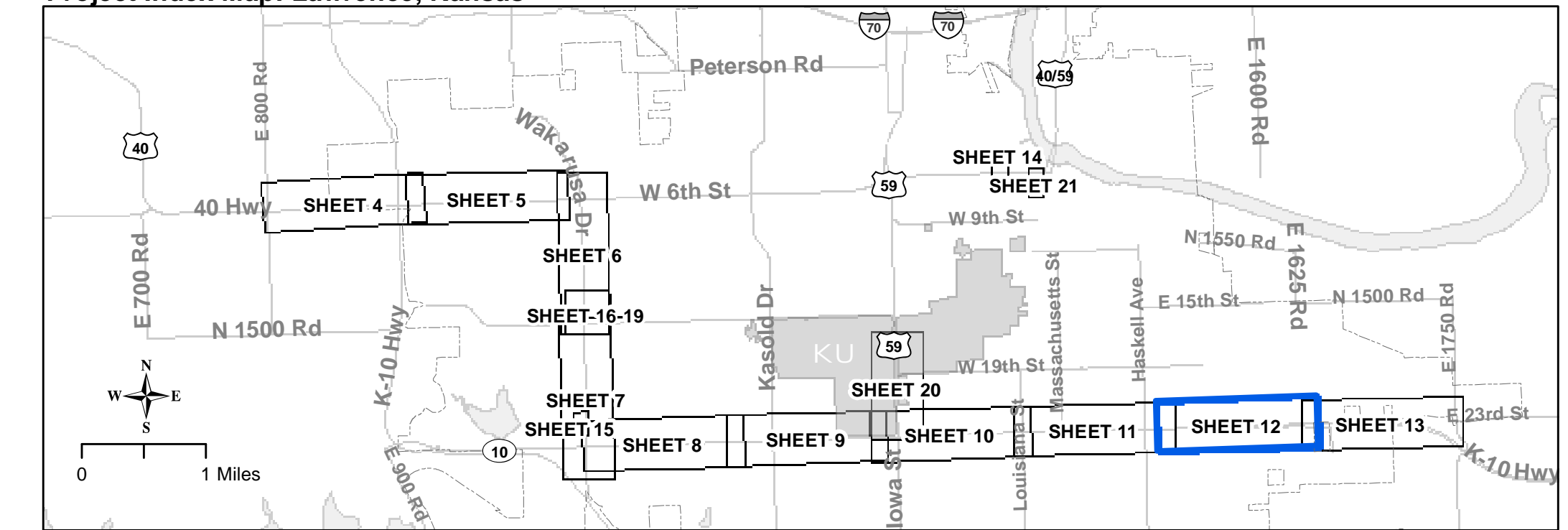


# PW1326 -- KU / City of Lawrence Fiber Project

**SHEET 12**

W 23rd Street - Harper Street to O'Connell Road

Project Index Map: Lawrence, Kansas



Legend					
☒	Splice Cabinet	+	CCTV Camera	□	Parcels
□	New Handhole	—	Project Conduit		
▣	Ex. Handhole	---	City Limit - Lawrence		

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<p><b>KU / City of Lawrence Fiber Project</b>                  W 23rd Street - Harper Street to O'Connell Road                  Project No. PW1326</p>	
<p><b>DAVID P. CRONIN, P.E.</b>                  CITY ENGINEER</p>	<p><b>DAVID L. CORLISS</b>                  CITY MANAGER</p>

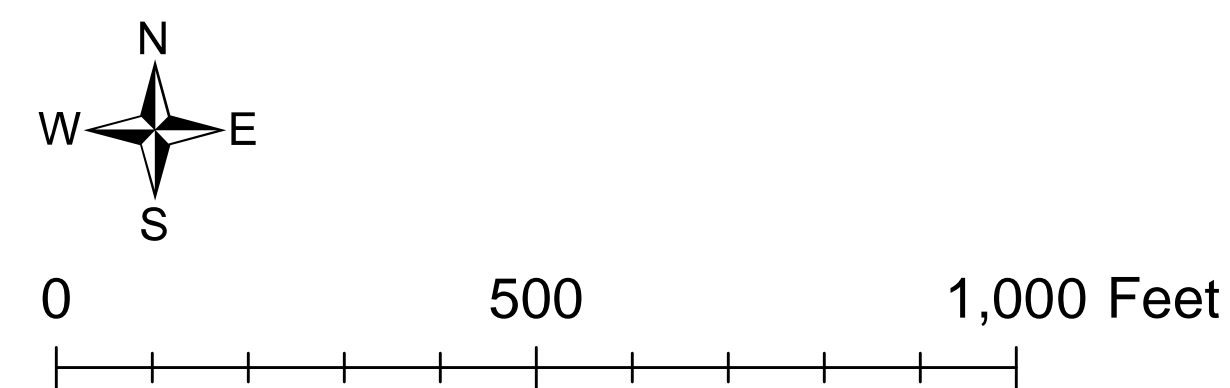
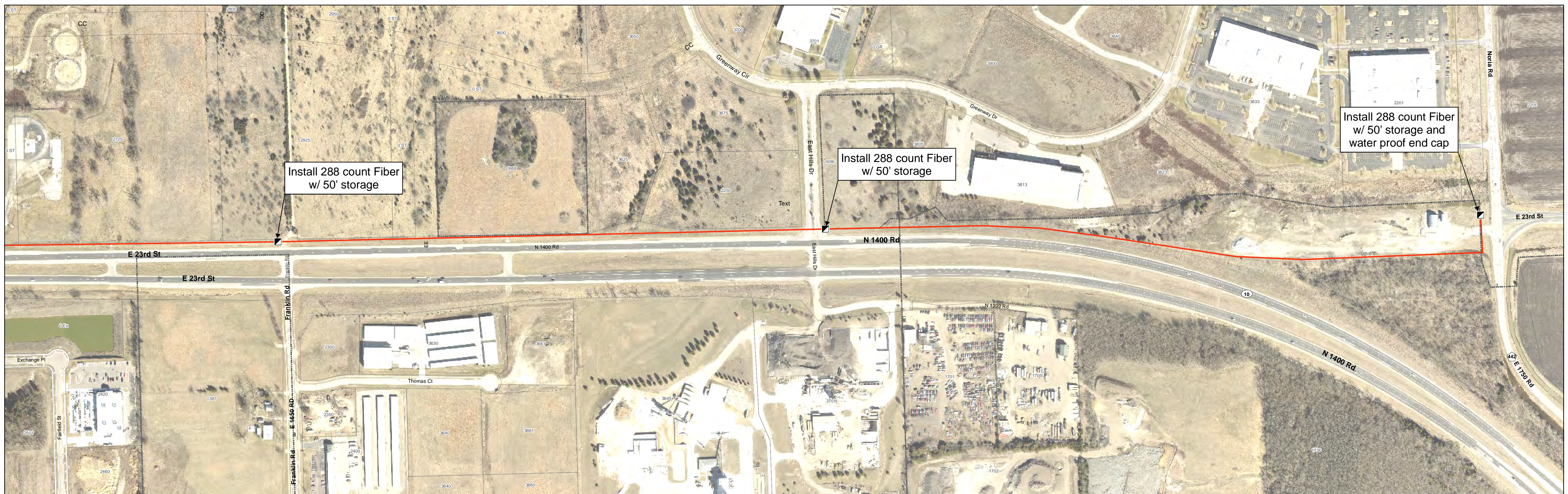
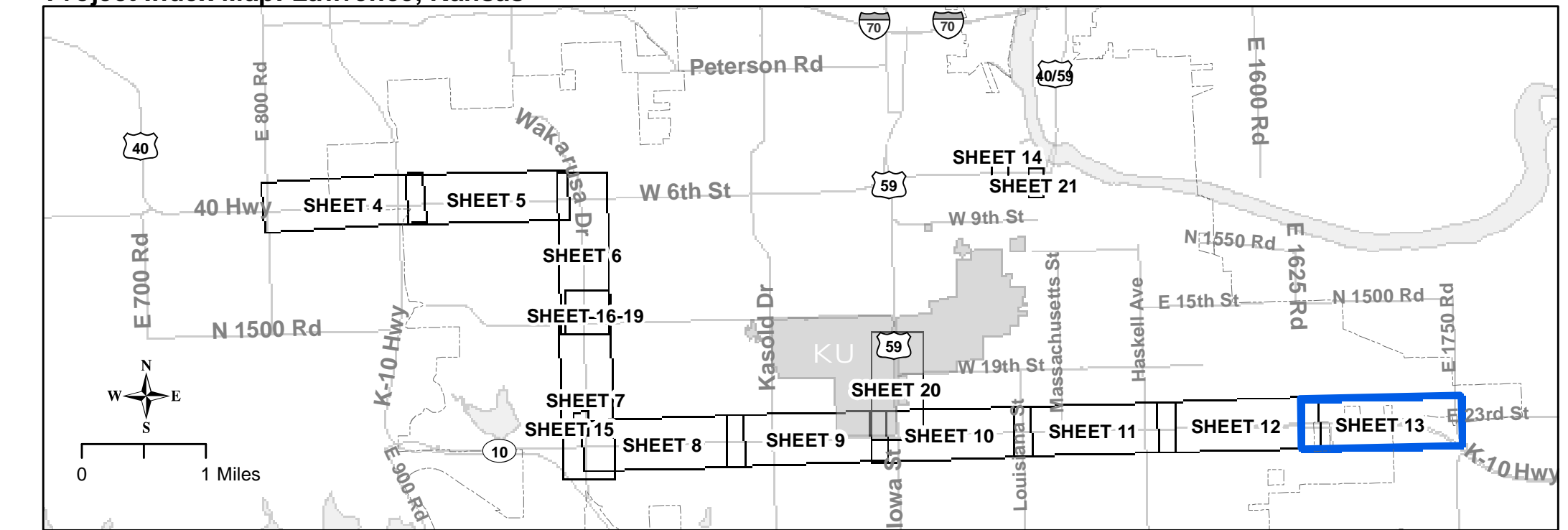


# PW1326 -- KU / City of Lawrence Fiber Project

**SHEET 13**

W 23rd Street - Franklin Road to Noria Road

Project Index Map: Lawrence, Kansas



Legend					
☒	Splice Cabinet	+	CCTV Camera	□	Parcels
☐	New Handhole	—	Project Conduit		
▣	Ex. Handhole	---	City Limit - Lawrence		

Revised: 7/19/2013 by mseibold	SHEET 13 of 29
<p><b>KU / City of Lawrence Fiber Project</b>                  W 23rd Street - Franklin Road to Noria Road                  Project No. PW1326</p>	
<p><b>DAVID P. CRONIN, P.E.</b>                  CITY ENGINEER</p>	<p><b>DAVID L. CORLISS</b>                  CITY MANAGER</p>



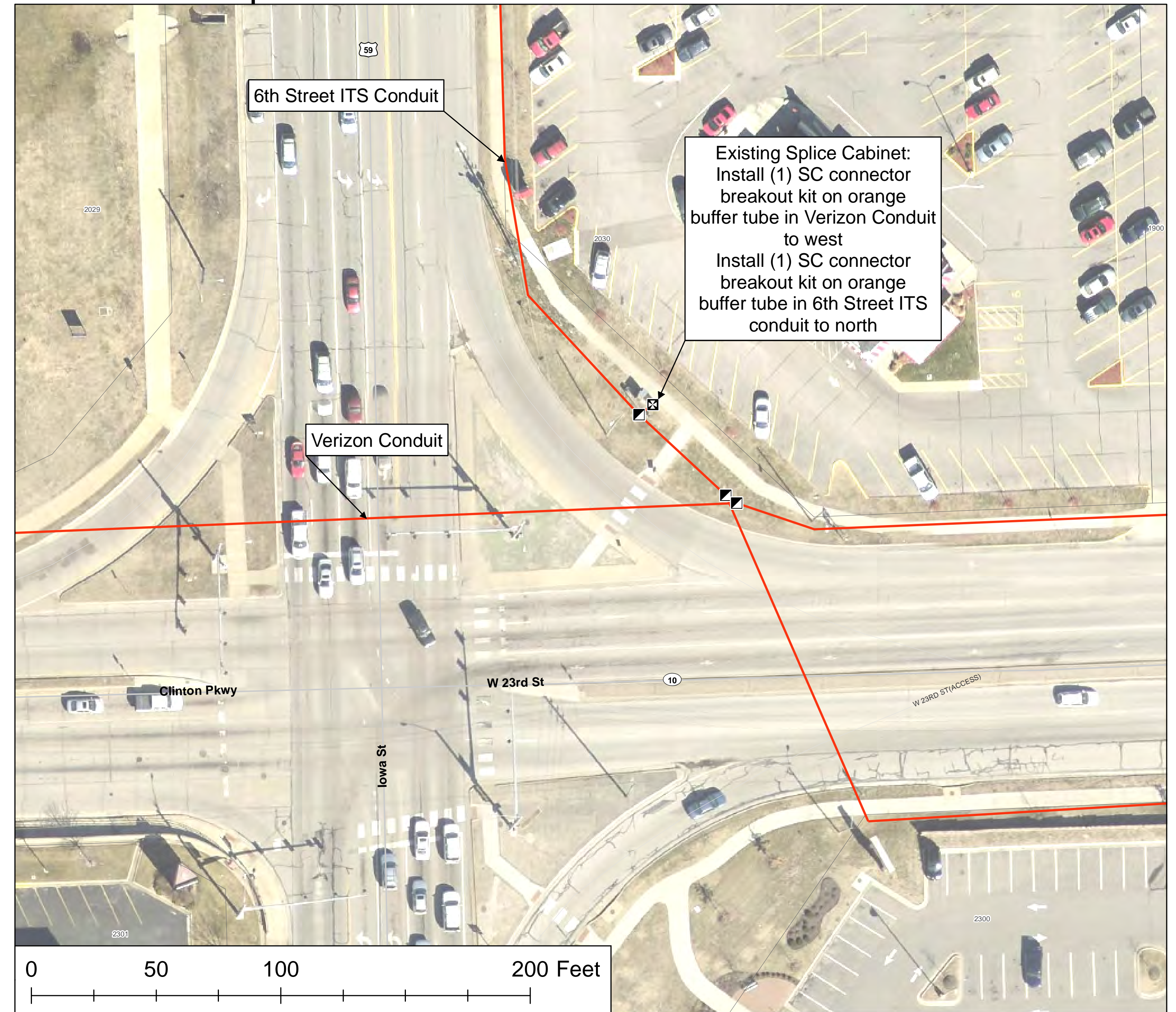
# PW1326 -- KU / City of Lawrence Fiber Project

## Traffic Division Splices: TOC / 6th & Mississippi / 23rd & Iowa

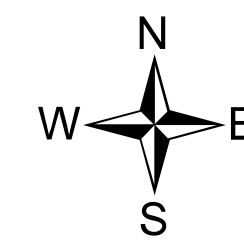
### Traffic Operations Center (TOC) and 6th & Mississippi



### 23rd & Iowa Splice Cabinet



Legend	
	Existing Splice Cabinet
	Existing Handhole
	Existing Conduit
	Parcels



Revised: 7/22/2013 by msebold

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**KU / City of Lawrence Fiber Project**  
 Traffic Division Splices: TOC / 6th & Mississippi / 23rd & Iowa  
 Project No. PW1326

**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER

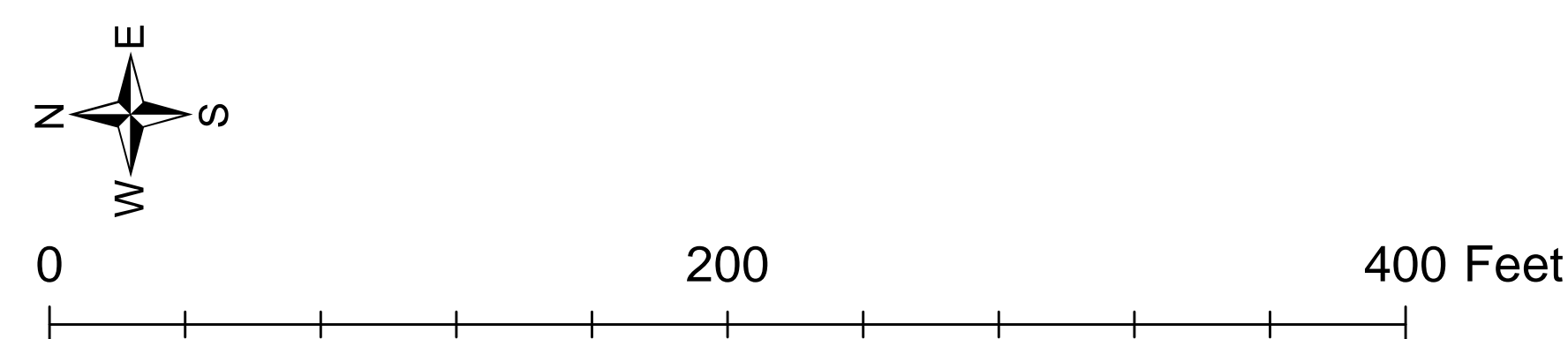
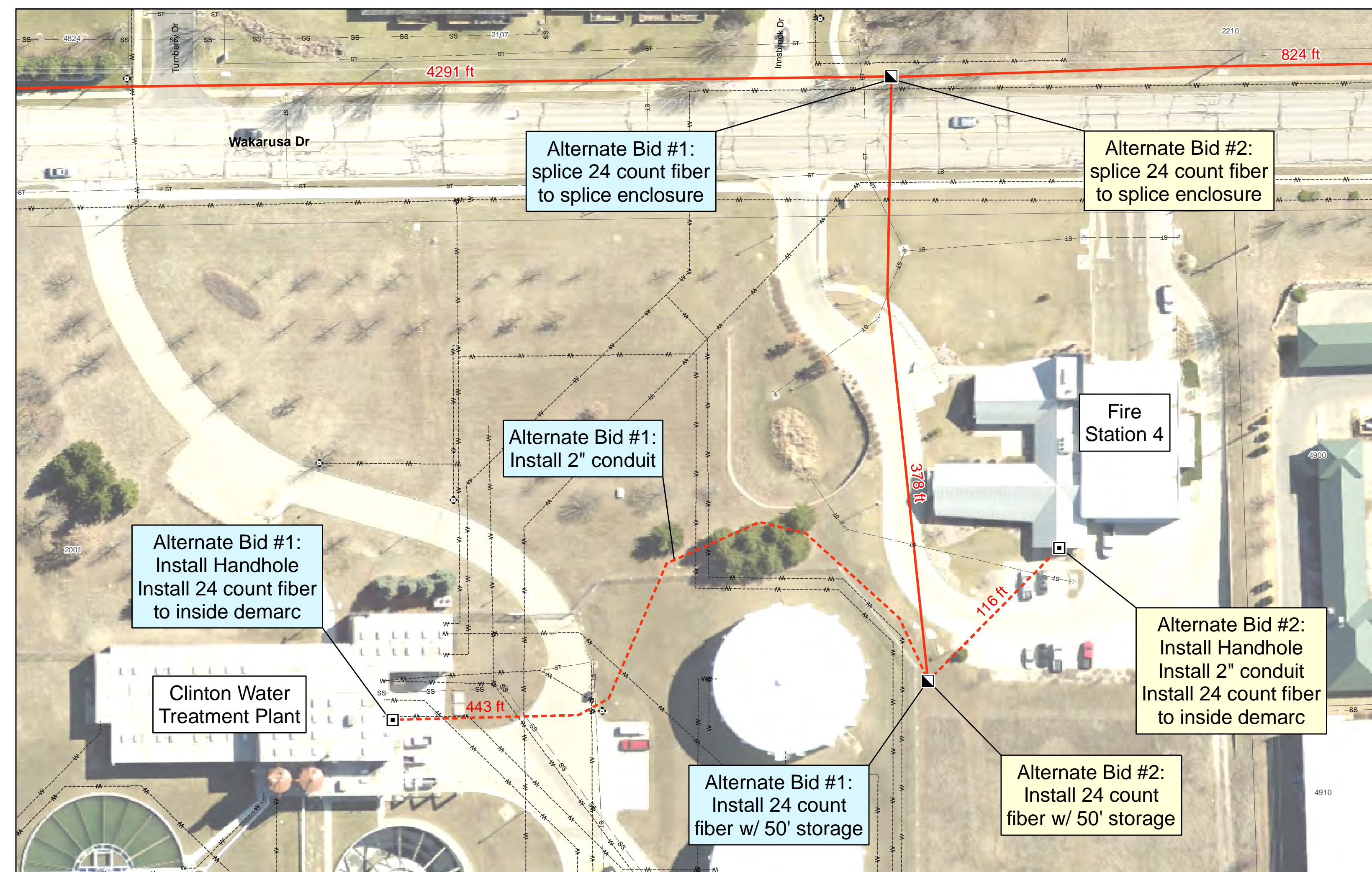
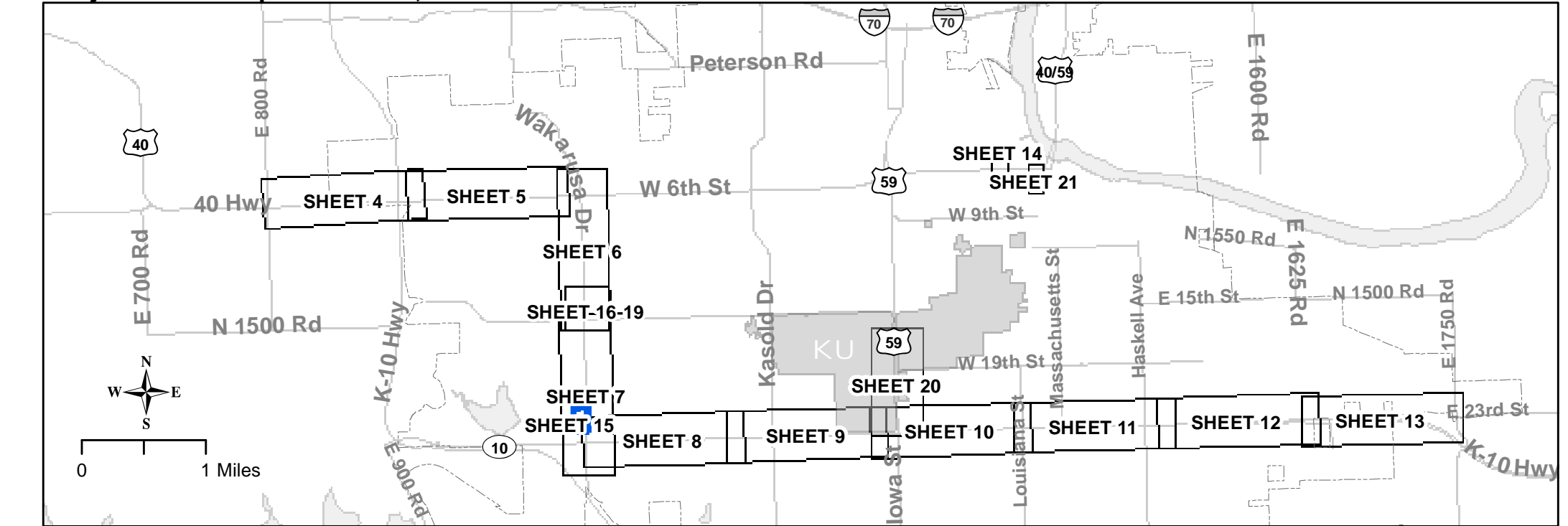


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 15

Alternate Bid #1: Clinton Plant / Alternate Bid #2: Fire Station No. 4

Project Index Map: Lawrence, Kansas



Legend		
	Ex. Handhole	
	New Handhole	
	Project Conduit	
	New Conduit	
	Storm Features	
	Storm Pipe	
	SS Manhole	
	SS Gravity Main	
	Water Hydrant	
	Water Main	
	City Limit - Lawrence	
	Parcels	

Revised: 7/22/2013 by msebold	SHEET 15 of 29
<b>KU / City of Lawrence Fiber Project</b> Alternate Bid #1: Clinton Plant / Alternate Bid #2: Fire Station No. 4 Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

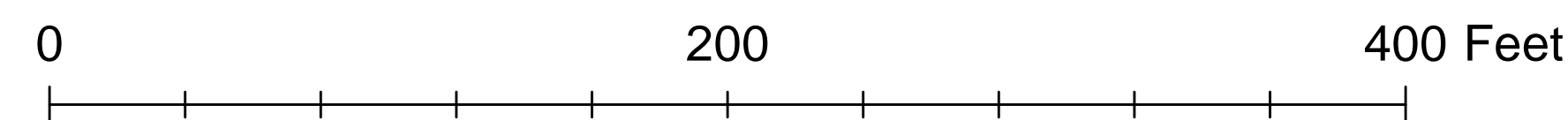
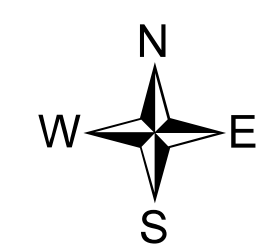
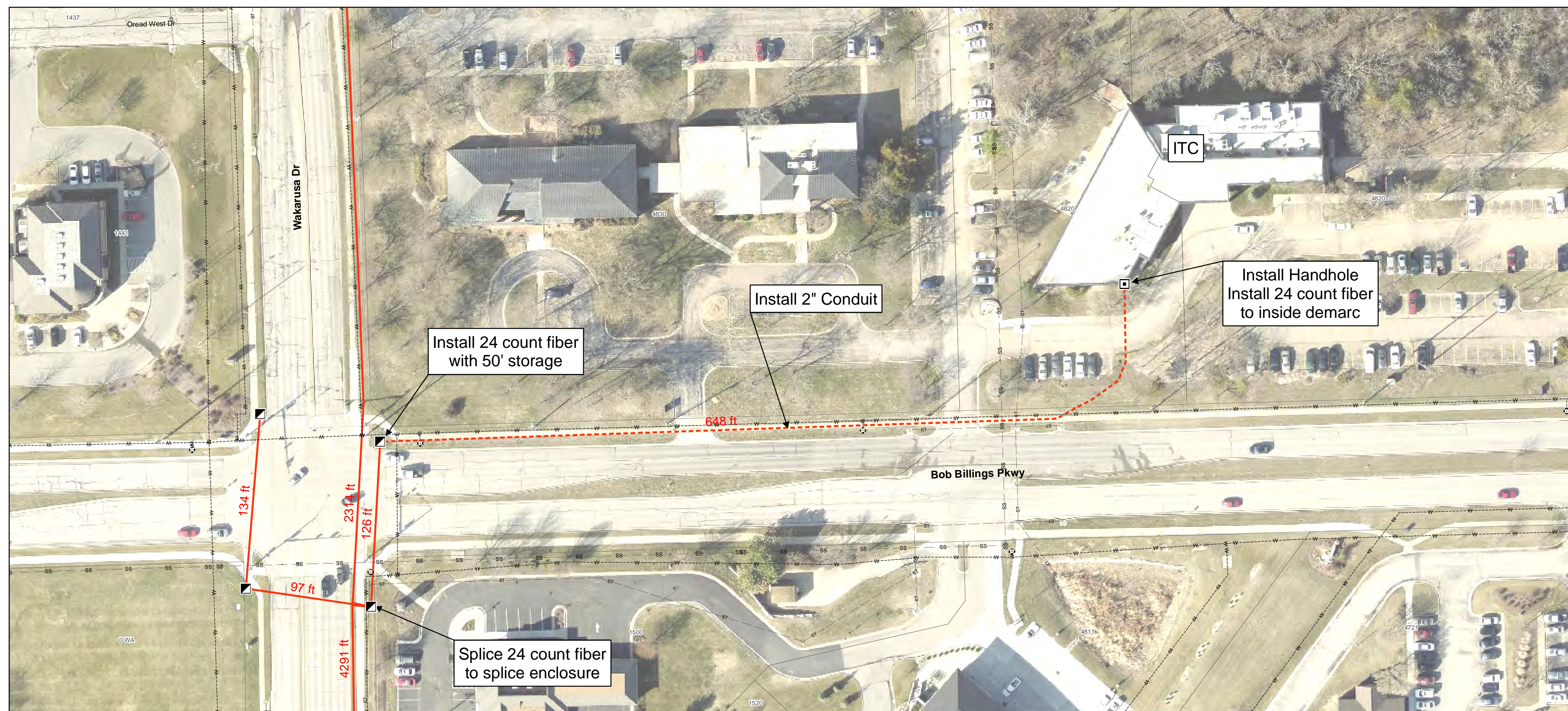
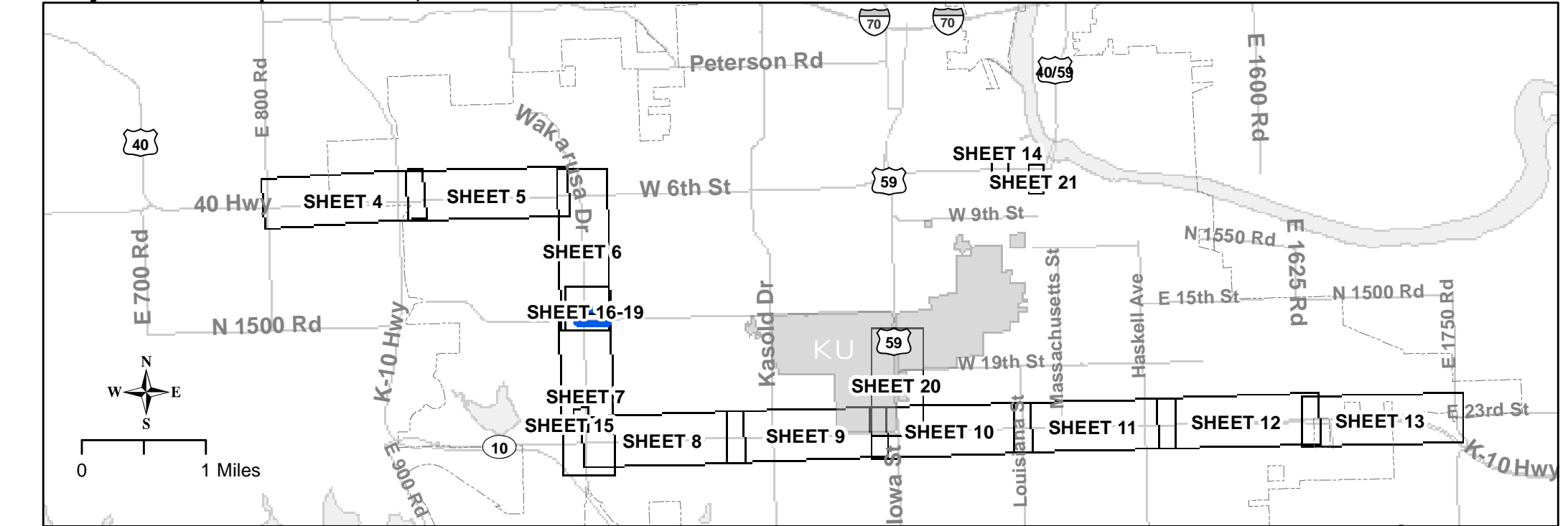


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 16

Alternate Bid #3: Investigations and Training Center

Project Index Map: Lawrence, Kansas



### Legend

- |       |                 |   |                 |   |                       |
|-------|-----------------|---|-----------------|---|-----------------------|
| ■     | Ex. Handhole    | ○ | Storm Features  | ⊗ | Water Hydrant         |
| □     | New Handhole    | — | Storm Pipe      | — | Water Main            |
| —     | Project Conduit | ● | SS Manhole      | — | City Limit - Lawrence |
| - - - | New Conduit     | — | SS Gravity Main | □ | Parcels               |

Revised: 7/22/2013 by msebold

SHEET 16 of 29



**KU / City of Lawrence Fiber Project**  
 Alternate Bid #3: Investigations and Training Center  
 Project No. PW1326

**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER

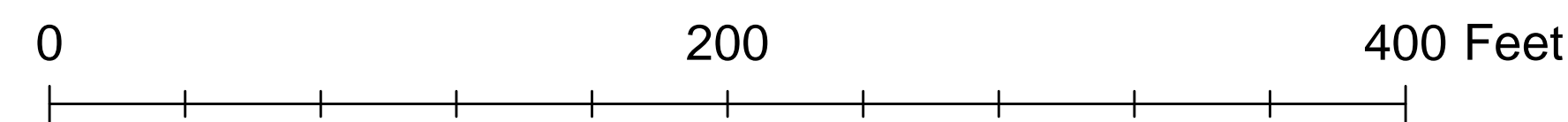
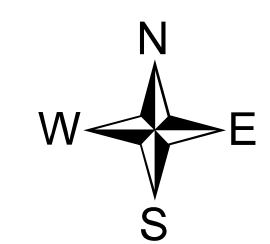
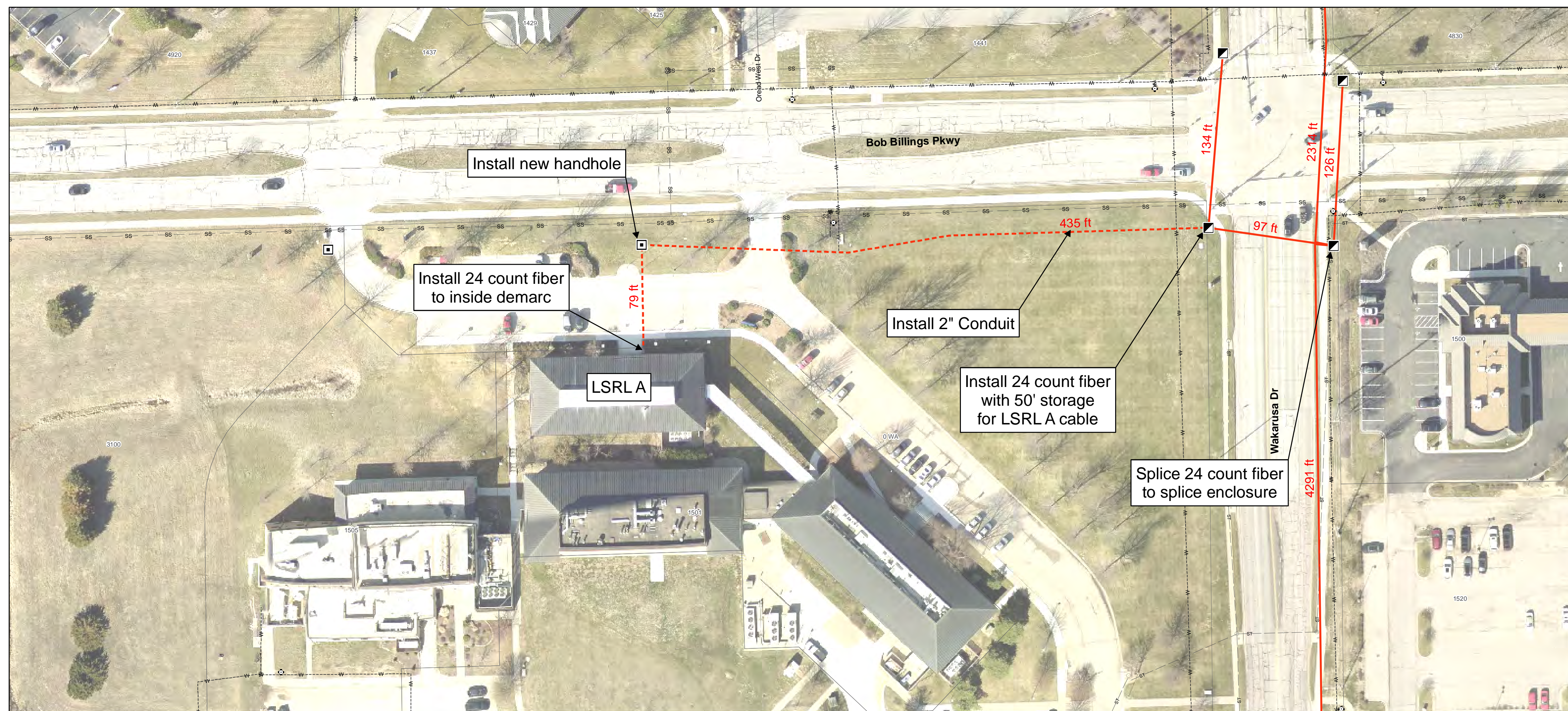
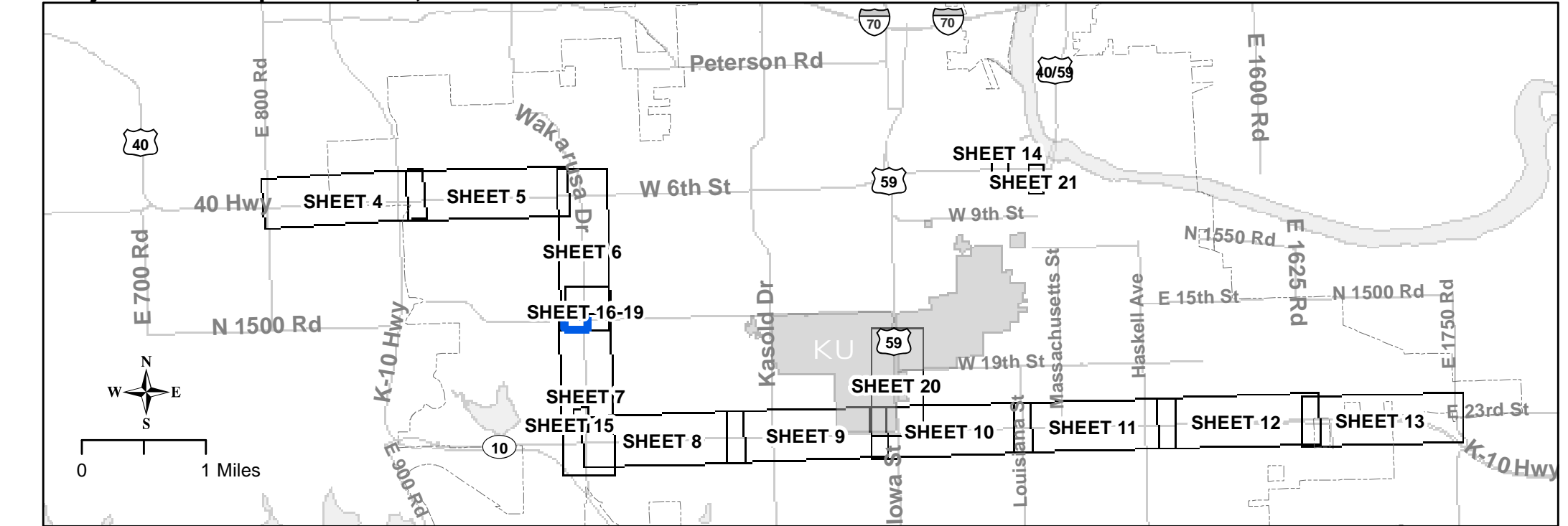


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 17

Alternate Bid #4: Life Science Research Lab (LSRL) Building A

Project Index Map: Lawrence, Kansas



### Legend

- |                   |                       |                           |
|-------------------|-----------------------|---------------------------|
| ■ Ex. Handhole    | ○ Storm Features      | ⊕ Water Hydrant           |
| □ New Handhole    | — Storm Pipe          | — Water Main              |
| — Project Conduit | ● SS Manhole          | --- City Limit - Lawrence |
| - - - New Conduit | - - - SS Gravity Main | □ Parcels                 |

Revised: 7/22/2013 by mseibold

SHEET 17 of 29



**KU / City of Lawrence Fiber Project**  
 Alternate Bid #4: Life Science Research Lab (LSRL) Building A  
 Project No. PW1326

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 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER

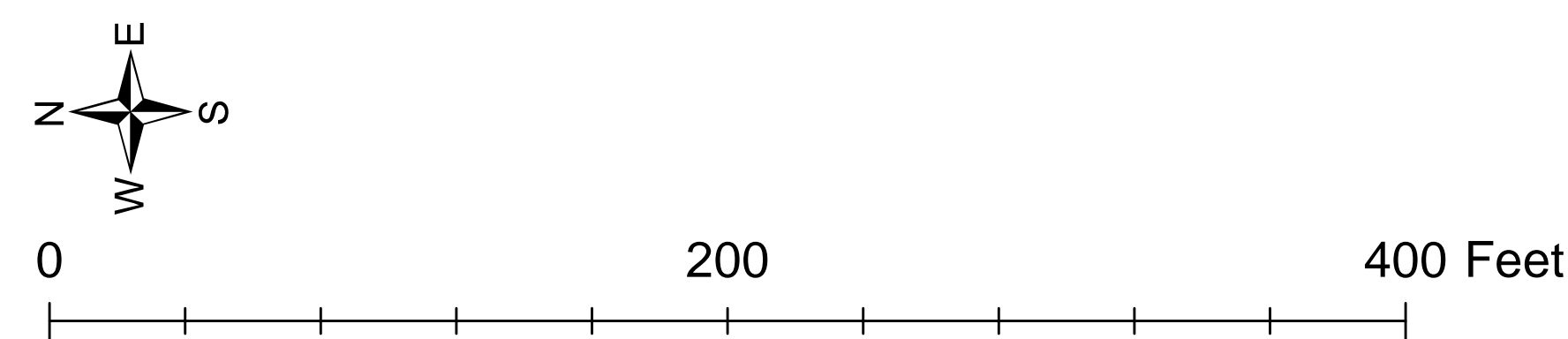
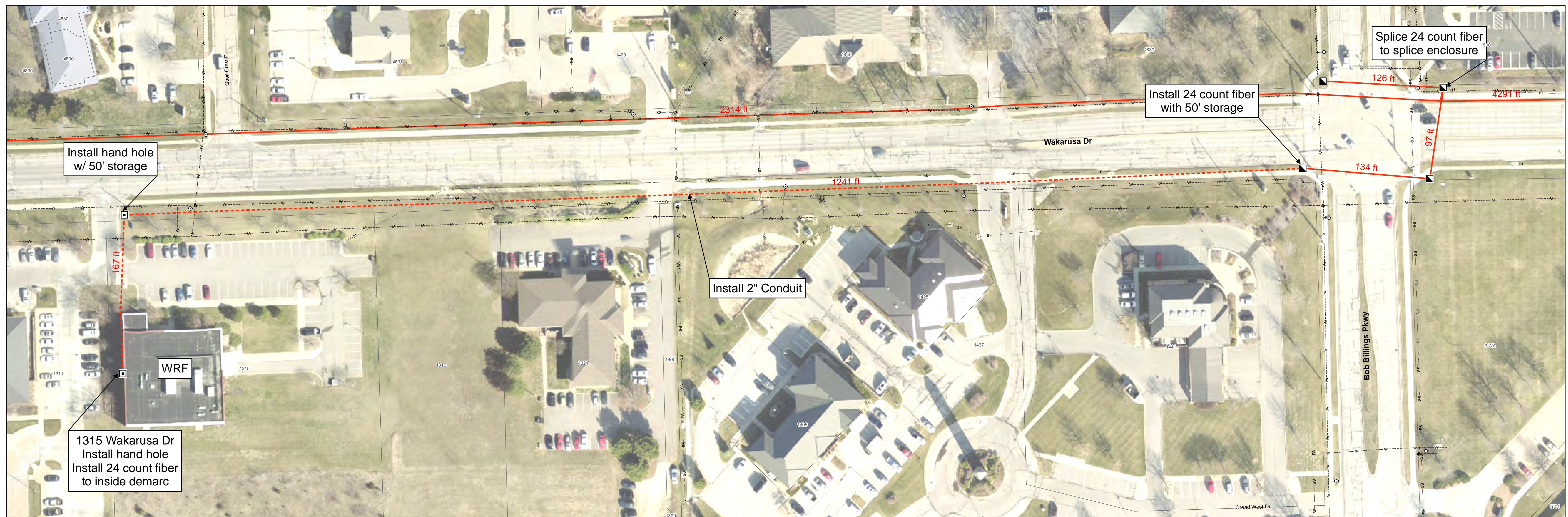
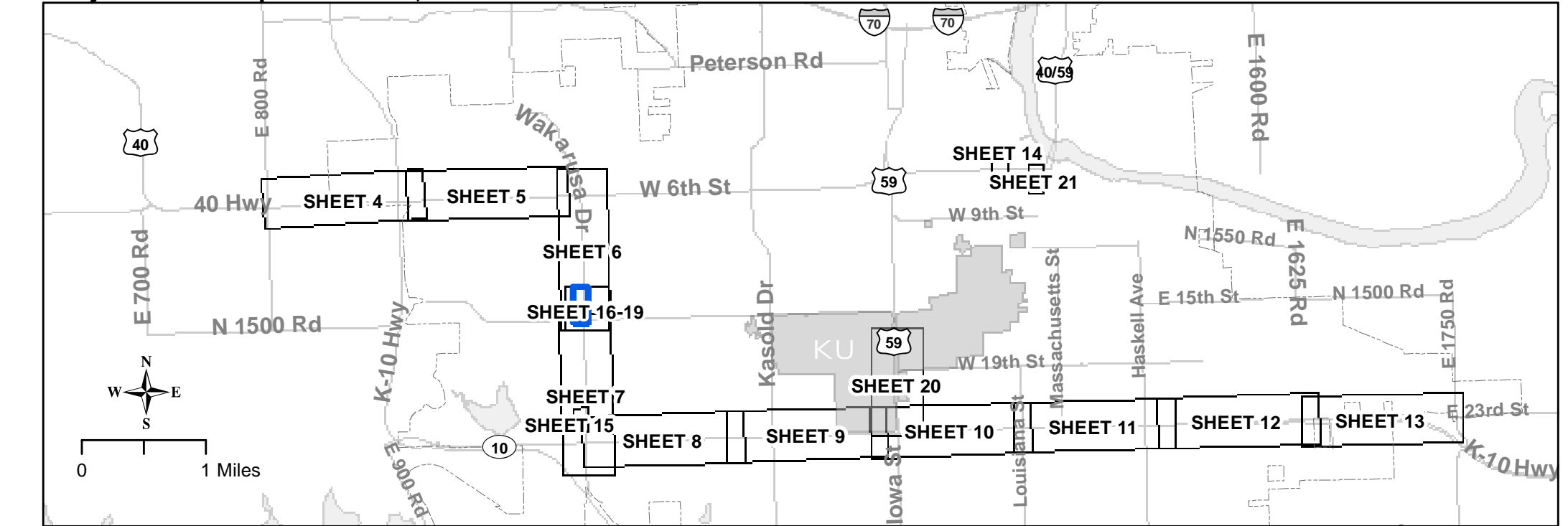


# PW1326 -- KU / City of Lawrence Fiber Project

**SHEET 18**

**Alternate Bid #5: Wakarusa Research Facility (WRF) 1315 Wakarusa Drive**

Project Index Map: Lawrence, Kansas



Legend					
■	Ex. Handhole	○	Storm Features	⊕	Water Hydrant
□	New Handhole	—	Storm Pipe	—	Water Main
—	Project Conduit	●	SS Manhole	---	City Limit - Lawrence
- - -	New Conduit	—	SS Gravity Main	□	Parcels

Revised: 7/22/2013 by mseibold	SHEET 18 of 29
<b>KU / City of Lawrence Fiber Project</b> Alternate Bid #5: Wakarusa Research Facility (WRF) 1315 Wakarusa Drive Project No. PW1326	
DAVID P. CRONIN, P.E. <small>CITY ENGINEER</small>	DAVID L. CORLISS <small>CITY MANAGER</small>

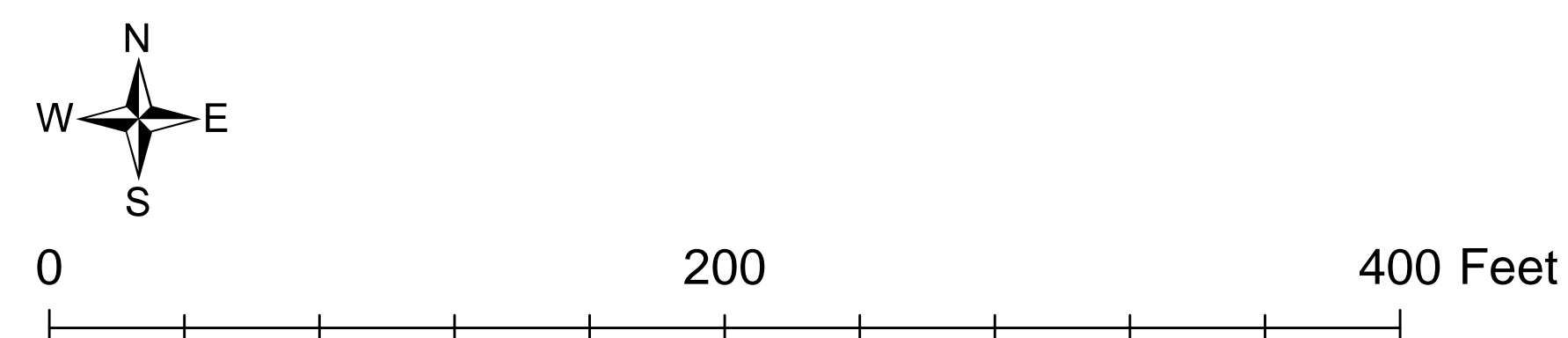
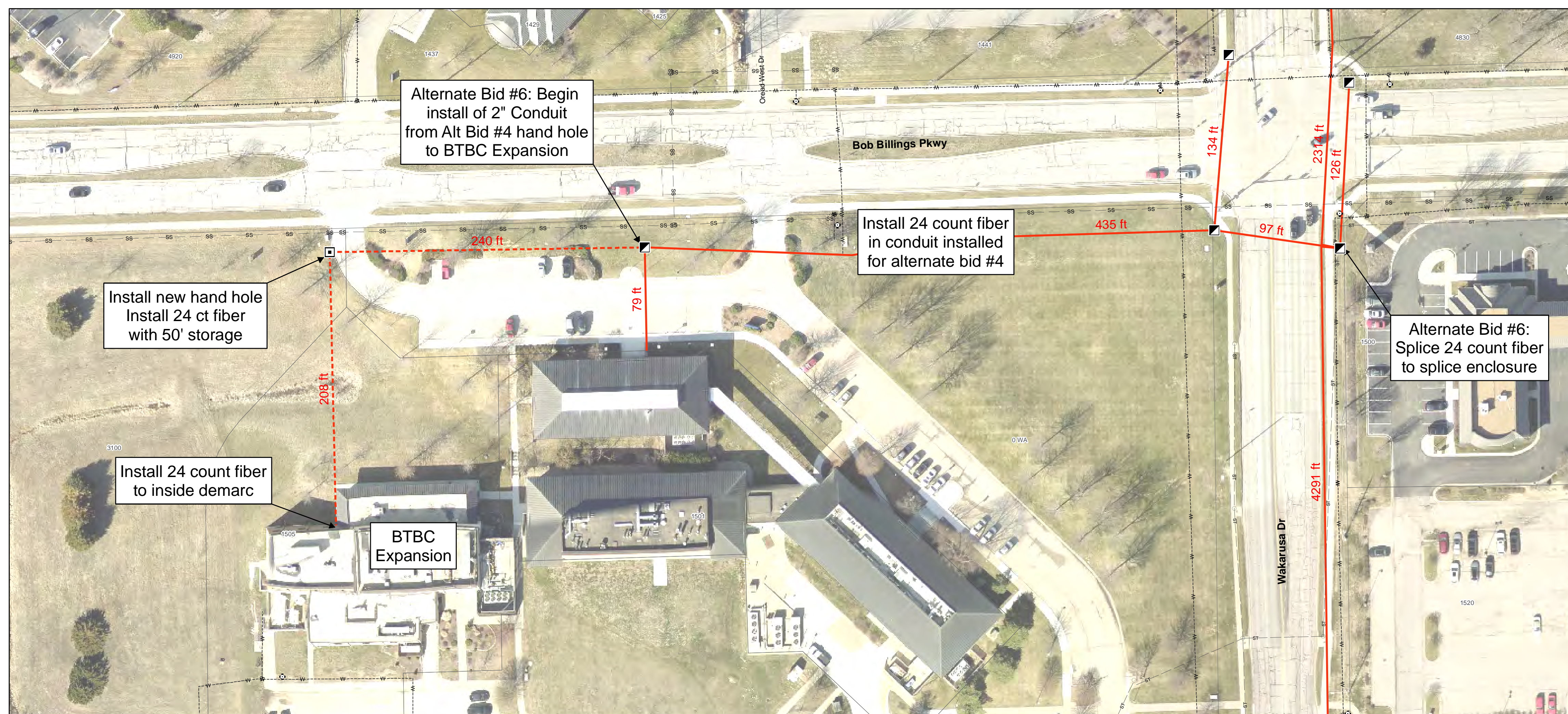
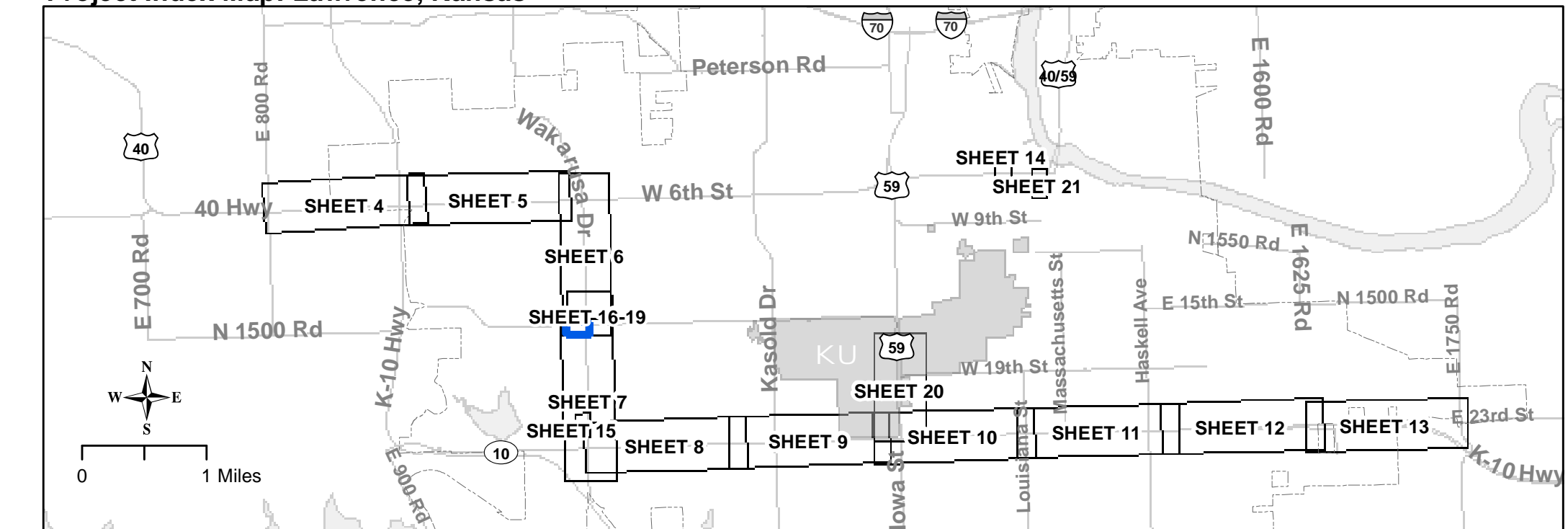


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 19

Alternate Bid #6: BTBC Expansion

Project Index Map: Lawrence, Kansas

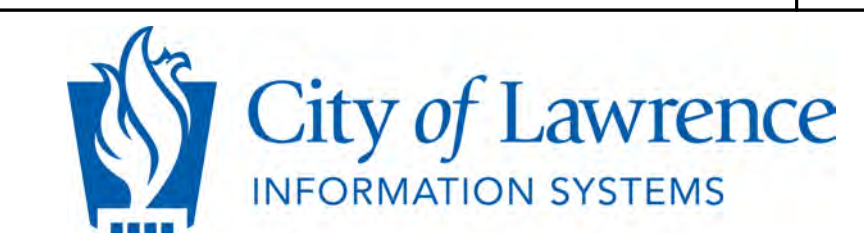


### Legend

- |     |                 |   |                 |     |                       |
|-----|-----------------|---|-----------------|-----|-----------------------|
| ■   | Ex. Handhole    | ○ | Storm Features  | ⊕   | Water Hydrant         |
| □   | New Handhole    | — | Storm Pipe      | —   | Water Main            |
| --- | New Conduit     | ● | SS Manhole      | --- | City Limit - Lawrence |
| —   | Project Conduit | — | SS Gravity Main | □   | Parcels               |

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SHEET 19 of 29



**KU / City of Lawrence Fiber Project**  
 Alternate Bid #6: BTBC Expansion  
 Project No. PW1326

**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER

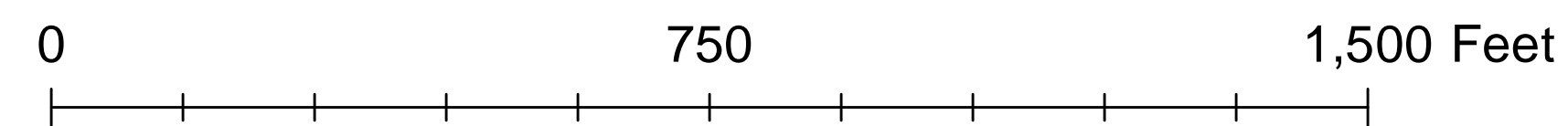
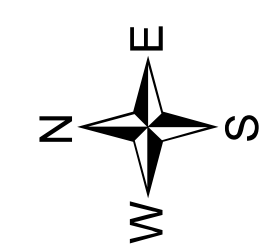
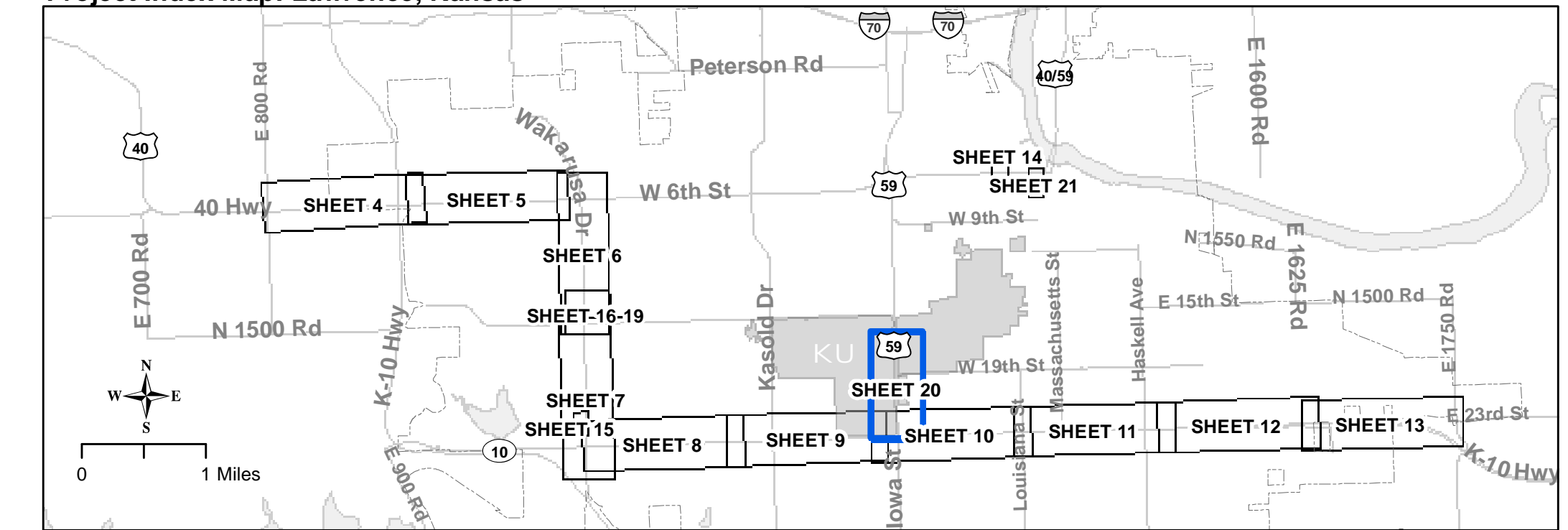


# PW1326 -- KU / City of Lawrence Fiber Project

SHEET 20

Alternate Bid #7: KU Ellsworth Hall to Clinton & Iowa

Project Index Map: Lawrence, Kansas



### Legend

- |                           |                      |                                 |
|---------------------------|----------------------|---------------------------------|
| ■ Ex. Handhole            | ○ Storm Features     | ⊕ Water Hydrant                 |
| - - - - - New Conduit     | - - - - - Storm Pipe | - - - - - Water Main            |
| — Project Conduit         | ● SS Manhole         | - - - - - City Limit - Lawrence |
| - - - - - SS Gravity Main | □ Parcels            |                                 |

Revised: 7/19/2013 by mseibold

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**KU / City of Lawrence Fiber Project**  
 Alternate Bid #7: KU Ellsworth Hall to Clinton & Iowa  
 Project No. PW1326

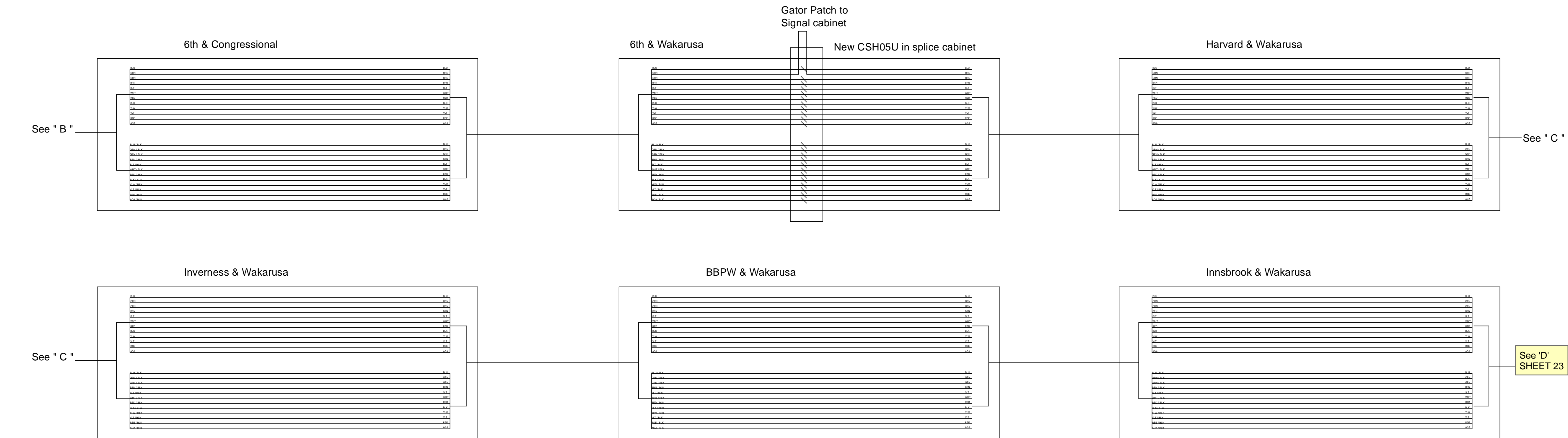
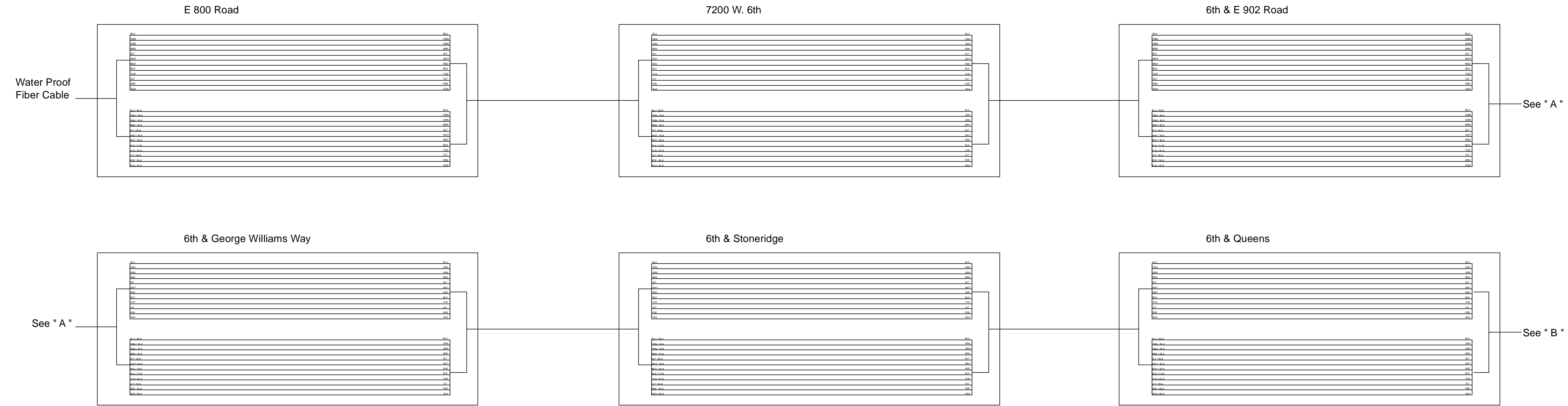
**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER









Revised: 7/22/2013 by mseibold

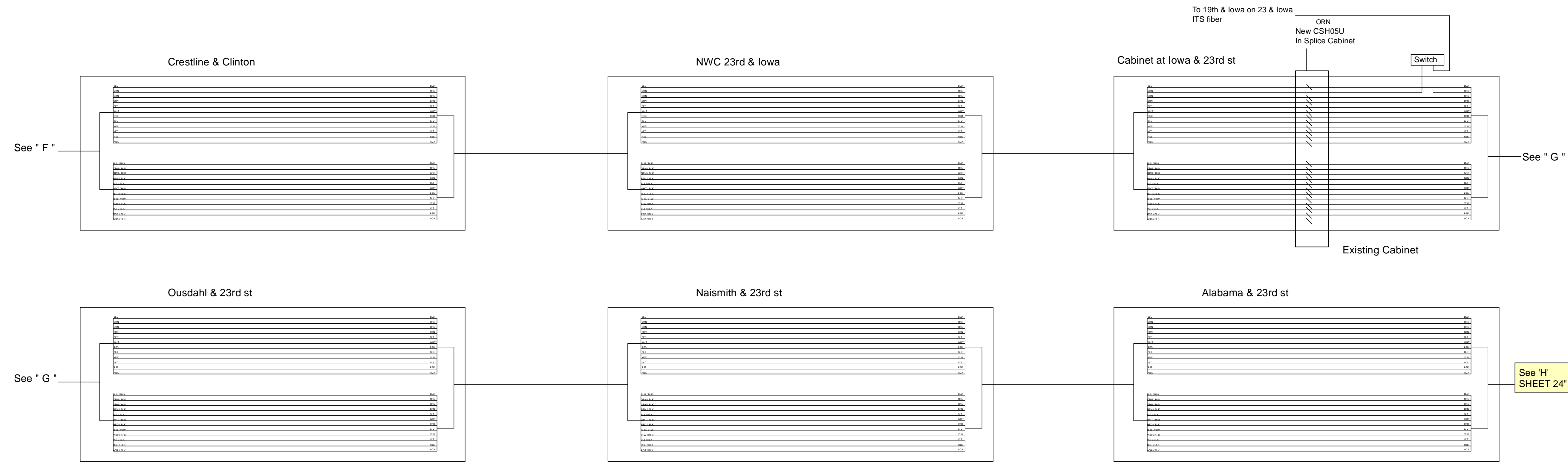
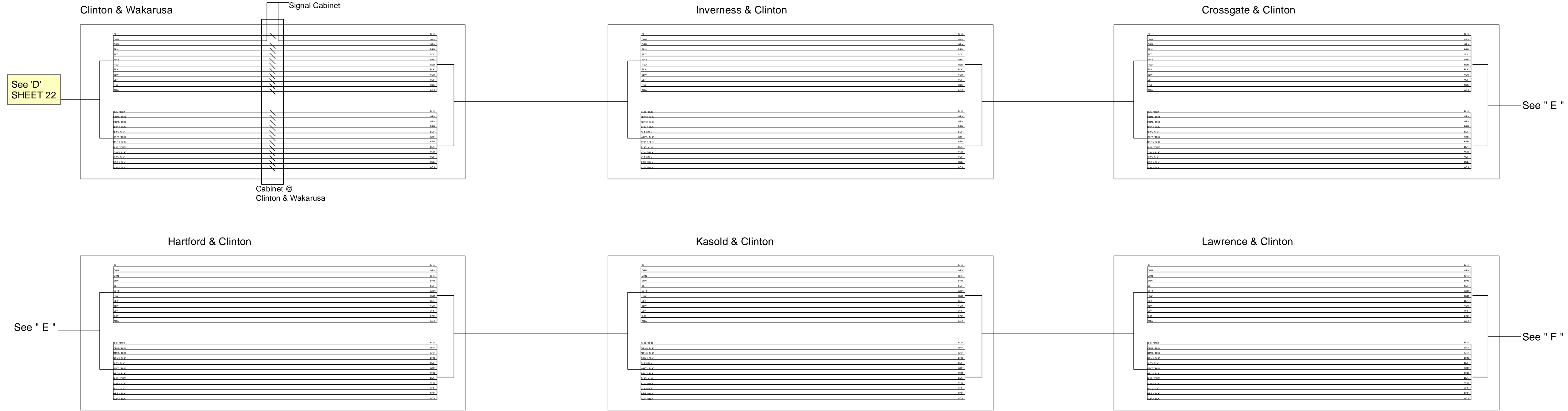


**KU / City of Lawrence Fiber Project**  
 Splice Diagram 1  
 Project No. PW1326

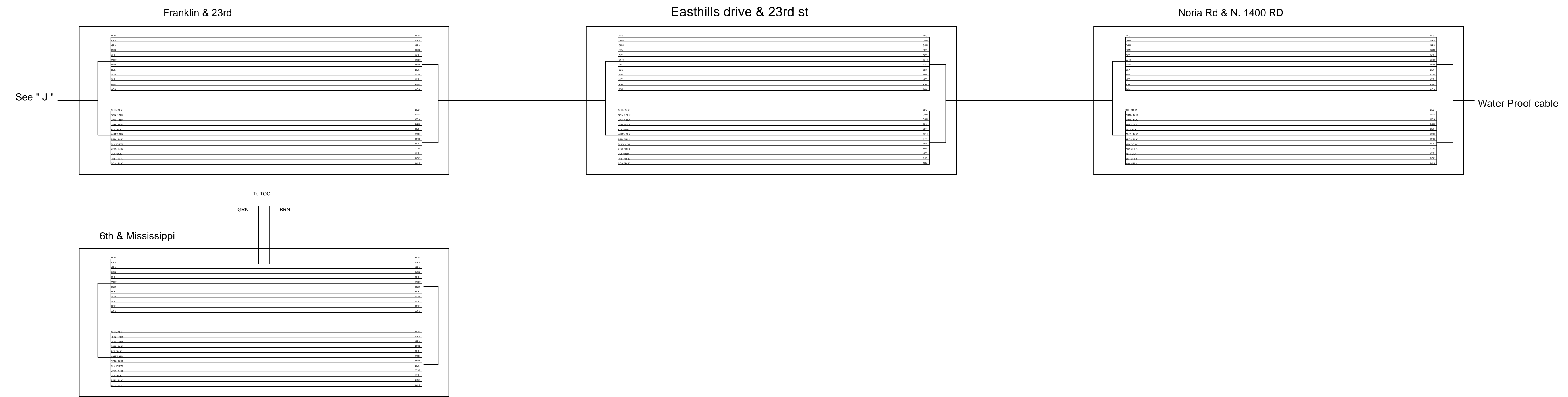
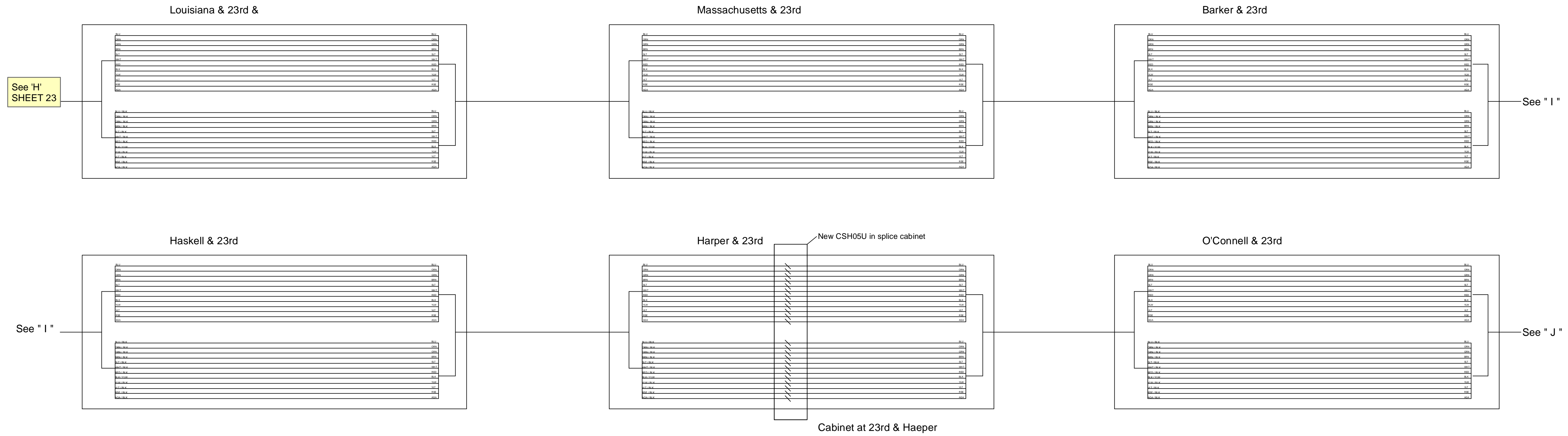
**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER







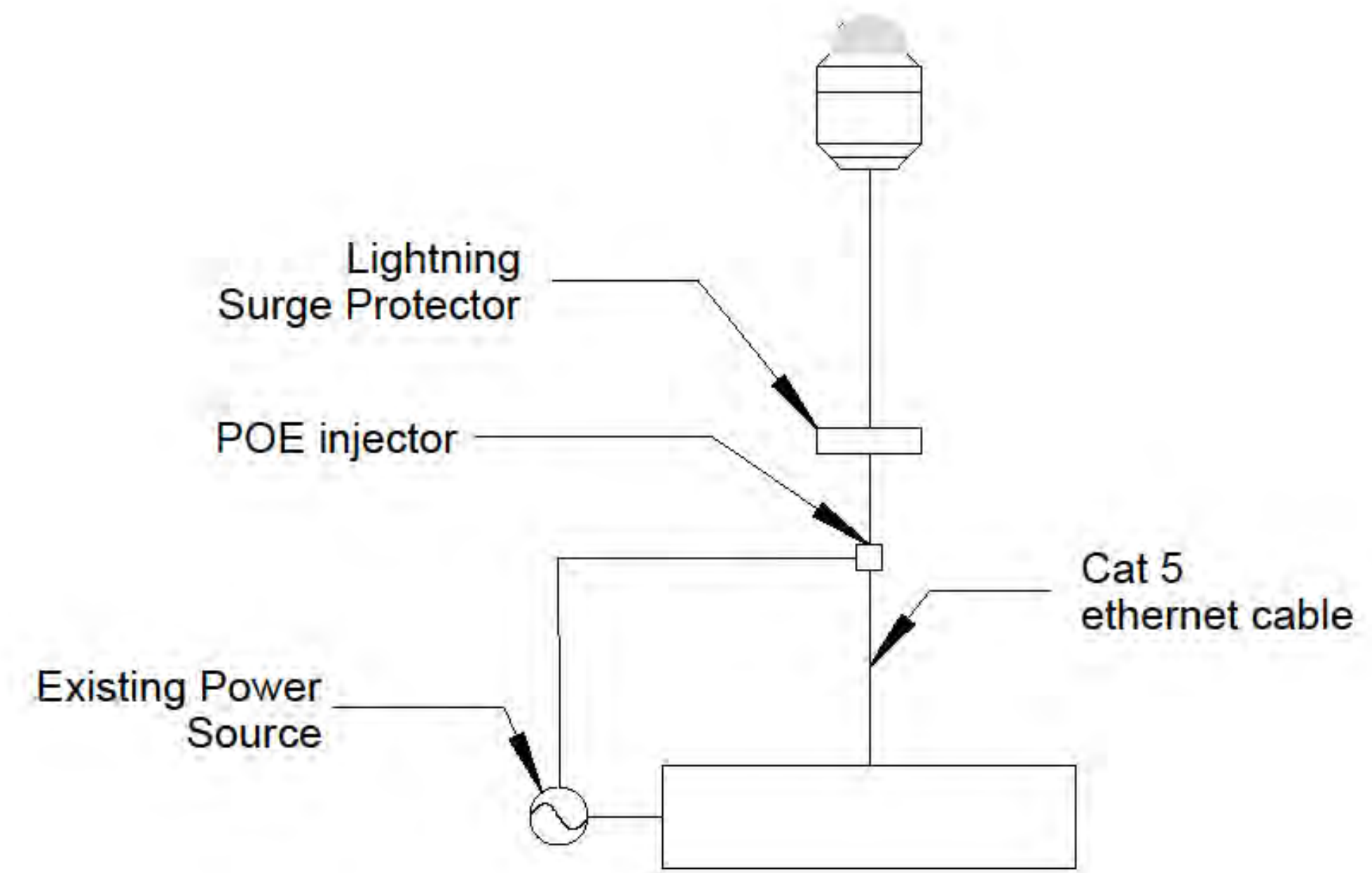
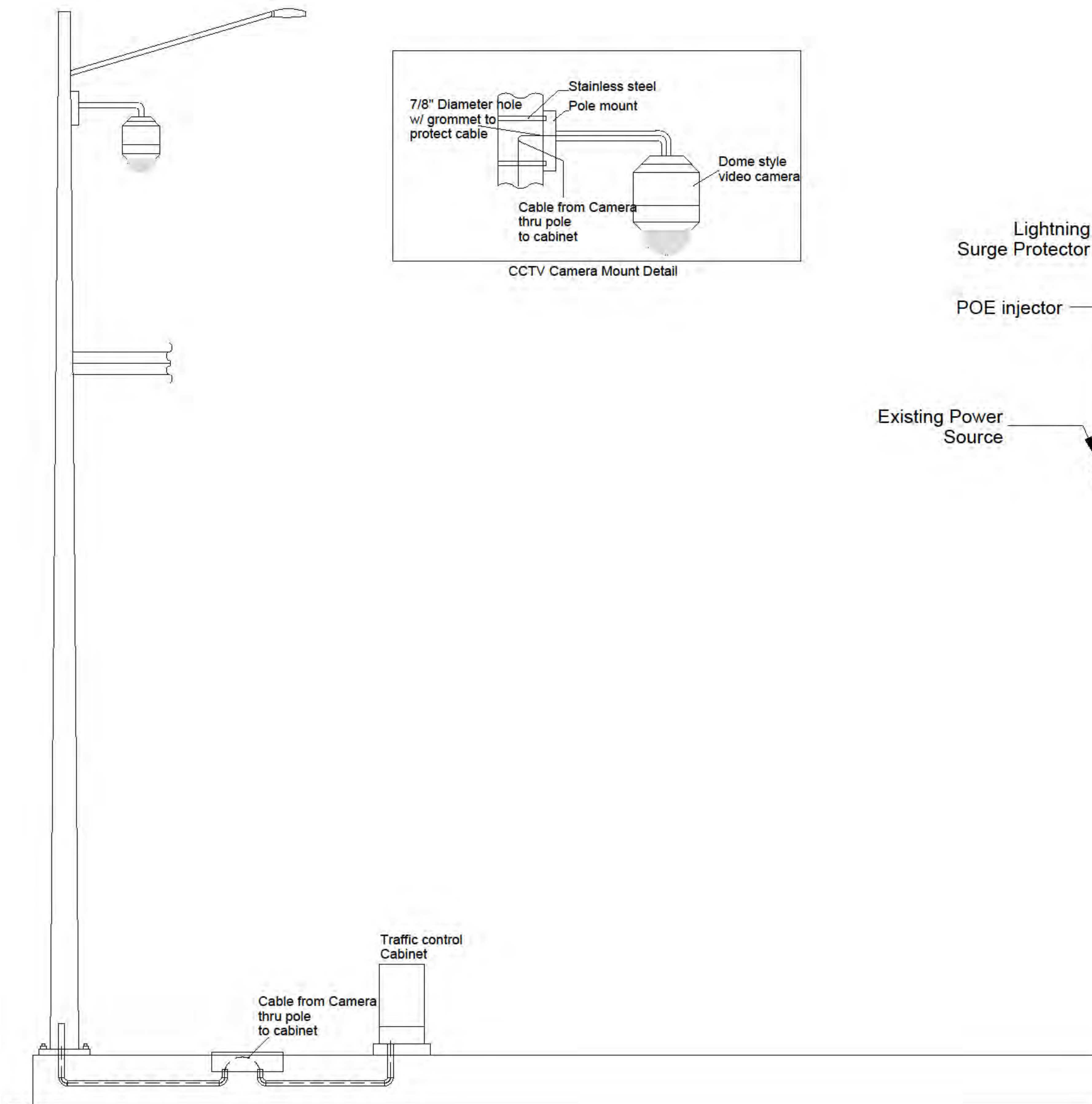


**KU / City of Lawrence Fiber Project**  
 Splice Diagram 3  
 Project No. PW1326

**DAVID P. CRONIN, P.E.**  
 CITY ENGINEER

**DAVID L. CORLISS**  
 CITY MANAGER





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**KU / City of Lawrence Fiber Project**  
 CCTV Standard Details  
 Project No. PW1326

DAVID P. CRONIN, P.E.  
 CITY ENGINEER

DAVID L. CORLISS  
 CITY MANAGER



STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	XX-XX XX-XXXX-XX	XXXX	XXX	XXX

**1. MUTCD COMPLIANCE:**

ALL TEMPORARY TRAFFIC CONTROL DEVICES AND THEIR INSTALLATION AND MAINTENANCE SHALL COMPLY WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WHICH HAS BEEN ADOPTED BY THE SECRETARY OF TRANSPORTATION. WHENEVER THE TEMPORARY TRAFFIC CONTROL STANDARDS CONFLICT WITH THE MUTCD, THE STANDARDS SHALL GOVERN.

**2. DESIGN SPEED:**

THOSE ITEMS DELEGATED TO TEMPORARY TRAFFIC CONTROL SHOULD BE DESIGNED AND INSTALLED USING THE POSTED/LEGAL SPEED OF THE ROADWAY PRIOR TO WORK STARTING.

**3. CLEAR ZONE:**

ALL CONSTRUCTION EQUIPMENT (INCLUDING VEHICLES), MATERIALS, AND DEBRIS SHALL BE STORED OUT OF THE CLEAR ZONE. WHERE THIS CANNOT BE ACHIEVED, THE CONTRACTOR SHALL PLACE APPROPRIATE SIGNS, OBJECT IDENTIFIERS, AND/OR BARRICADES AS DESIGNATED BY THE ENGINEER. TEMPORARY TRAFFIC CONTROL DEVICES NEEDED FOR THIS CONDITION SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

**4. MINIMUM LANE WIDTHS:**

LANE WIDTHS SHALL BE A MINIMUM OF 11' (MEASURED BETWEEN CENTERLINES OF PAVEMENT MARKINGS) OR AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER. A LANE WIDTH LESS THAN 11' MAY REQUIRE RESTRICTED ROADWAY WIDTH SIGNING.

**5. FLAGGER:**

A MINIMUM OF ONE FLAGGER SHALL BE STATIONED WITHIN EACH MULTI-LANE ROADWAY ACTIVITY AREA WHERE WORK IS IN A CLOSED LANE ADJACENT TO TRAFFIC AND NOT SEPARATED BY A CONCRETE SAFETY BARRIER SYSTEM.

**6. PAVEMENT MARKING:**

WHEN THE WORK WILL OCCUPY A LOCATION MORE THAN THREE DAYS, ALL CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED OR MASKED AND ALL TRANSITION TAPERS, CROSSOVERS, AND EDGE LINES ALONG CHANNELIZING DEVICES SHALL BE MARKED WITH SOLID 4" WIDE PAVEMENT MARKING.

**7. FIRST MODULE OF IBS:**

THE FIRST MODULE OF EACH INERTIAL BARRIER SYSTEM (IBS) SHALL HAVE A MINIMUM OF 2 SQ. FT. OF FLUORESCENT ORANGE ASTM TYPE IV SHEETING FACING TRAFFIC. EITHER A VERTICAL RECTANGLE OR DIAMOND SHAPE MAY BE USED.

**8. PEDESTRIAN / BICYCLE SAFETY:**

WORK ZONE SIGNS SHALL NOT INHIBIT PEDESTRIAN AND BICYCLE TRAFFIC ON SIDEWALKS OR OTHER AREAS DESIGNATED FOR PEDESTRIAN OR BICYCLE USE.

CONSIDERATION SHOULD BE MADE TO SEPARATE PEDESTRIAN AND BICYCLE MOVEMENTS FROM BOTH WORK SITE ACTIVITY AND VEHICULAR TRAFFIC. UNLESS A REASONABLE SAFE ROUTE THAT DOES NOT INVOLVE CROSSING THE ROADWAY CAN BE PROVIDED, PEDESTRIANS AND BICYCLISTS SHOULD BE APPROPRIATELY DIRECTED WITH ADVANCE SIGNING THAT ENCOURAGES THEM TO CROSS TO THE OPPOSITE SIDE OF THE ROADWAY. IN URBAN AND SUBURBAN AREAS WITH HIGH VEHICULAR TRAFFIC VOLUMES, THESE SIGNS SHOULD BE PLACED AT INTERSECTIONS (RATHER THAN MIDBLOCK LOCATIONS) SO THAT PEDESTRIANS AND BICYCLISTS ARE NOT CONFRONTED WITH MIDBLOCK WORK SITES THAT WILL INDUCE THEM TO ATTEMPT SKIRTING THE WORK SITE OR MAKING A MIDBLOCK CROSSING.

WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED, THE TEMPORARY FACILITIES SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.

**9. CHANGED STOP CONDITIONS:**

ATTACH TWO FLUORESCENT RED-ORANGE FLAGS AND A RED TYPE "B" HIGH INTENSITY WARNING LIGHT TO ANY STOP SIGN THAT CREATES A NEW STOP CONDITION OR MOVES THE STOP CONDITION TO A NEW LOCATION. LEAVE FLAGS AND LIGHTS IN PLACE FOR AT LEAST THE FIRST 30 DAYS. INSTALL W3-1 (SYMBOLIC STOP AHEAD) SIGN IN ADVANCE OF STOP SIGN IF STOP SIGN IS NOT VISIBLE FOR A MINIMUM OF DISTANCE 'A' (SEE CHART ON TE710) OR IF STOP CONDITION IS MOVED TO LESS THAN DISTANCE 'A' FROM AN EXISTING STOP AHEAD SIGN.

**10. LUMP SUM BIDDING:**

WHEN TRAFFIC CONTROL IS BID LUMP SUM, ADDITIONAL DEVICES WILL BE PAID FOR AS EXTRA WORK.

**11. NIGHTTIME LIGHTING:**

WHEN NIGHTTIME WORK IS REQUIRED, FLOODLIGHTS SHOULD BE USED TO ILLUMINATE FLAGGER STATIONS, EQUIPMENT CROSSINGS, AND OTHER AREAS WHERE EXISTING LIGHTING IS NOT ADEQUATE FOR THE WORK TO BE PERFORMED SAFELY.

IN NO CASE SHALL FLOODLIGHTS BE PERMITTED TO CREATE A DISABLING GLARE FOR THE DRIVER. THE ADEQUACY OF THE FLOODLIGHT PLACEMENT AND ELIMINATION OF POTENTIAL GLARE SHOULD BE CHECKED BY DRIVING THROUGH THE PROJECT.

**12. NCHRP REPORT 350 CRASHWORTHY REQUIREMENTS:**

TRAFFIC CONTROL DEVICES SHALL MEET THE EVALUATION CRITERIA IN NCHRP REPORT 350 OR IN MASH REPORT 2009 AS SUPPLEMENTED BY FHWA MEMORANDUM "IDENTIFYING ACCEPTABLE HIGHWAY SAFETY FEATURES," DATED JULY 25, 1997. AVAILABLE ON THE INTERNET AT [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/policy\\_memo/](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/policy_memo/)

ANY DEVICE NOT ADDRESSED BY THE TE STANDARDS MAY BE APPROVED ON A CASE BY CASE BASIS BY THE ENGINEER. THE DEVICE SHALL BE ACCOMPANIED BY AND INSTALLED ACCORDING TO MASH REPORT 2009. ANY DEVICE ACCEPTED PRIOR TO THE ADOPTION OF MASH REPORT 2009 USING CRITERIA FROM NCHRP REPORT 350 MAY REMAIN IN PLACE AND CONTINUE TO BE USED. ANY TRAFFIC CONTROL DEVICE ACCEPTED USING NCHRP REPORT 350 CRITERIA IS NOT REQUIRED TO BE TESTED UNDER MASH REPORT 2009. HOWEVER, NEW TRAFFIC CONTROL DEVICES NOT PREVIOUSLY EVALUATED MUST UTILIZE MASH REPORT 2009 FOR TESTING AND EVALUATION.

**THE CONTRACTOR SHALL:**

1) PROVIDE TO THE ENGINEER A COPY OF THE MANUFACTURER'S SELF-CERTIFICATION THAT ANY CATEGORY 1 (i.e. - PLASTIC CONICAL DELINEATORS, TUBULAR MARKERS, DRUMS WITHOUT ATTACHMENTS) AND CATEGORY 2 (i.e. - PORTABLE SIGN STANDS (WITH SIGNS), TYPE II AND III BARRICADES, AND VERTICAL PANELS) DEVICES USED ON THE PROJECT ARE NCHRP REPORT 350 OR MASH REPORT 2009 COMPLIANT.

2) PROVIDE TO THE ENGINEER A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER (WZ-xxx) FOR ANY CATEGORY 2 DEVICE (i.e. - PORTABLE SIGN STANDS (WITH SIGNS), TYPE II AND III BARRICADES, AND VERTICAL PANELS) USED ON THE PROJECT. WORK ZONE FHWA ACCEPTANCE LETTERS (WZ-xxx) ARE AVAILABLE ON THE INTERNET AT: [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/wzd/](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/wzd/)

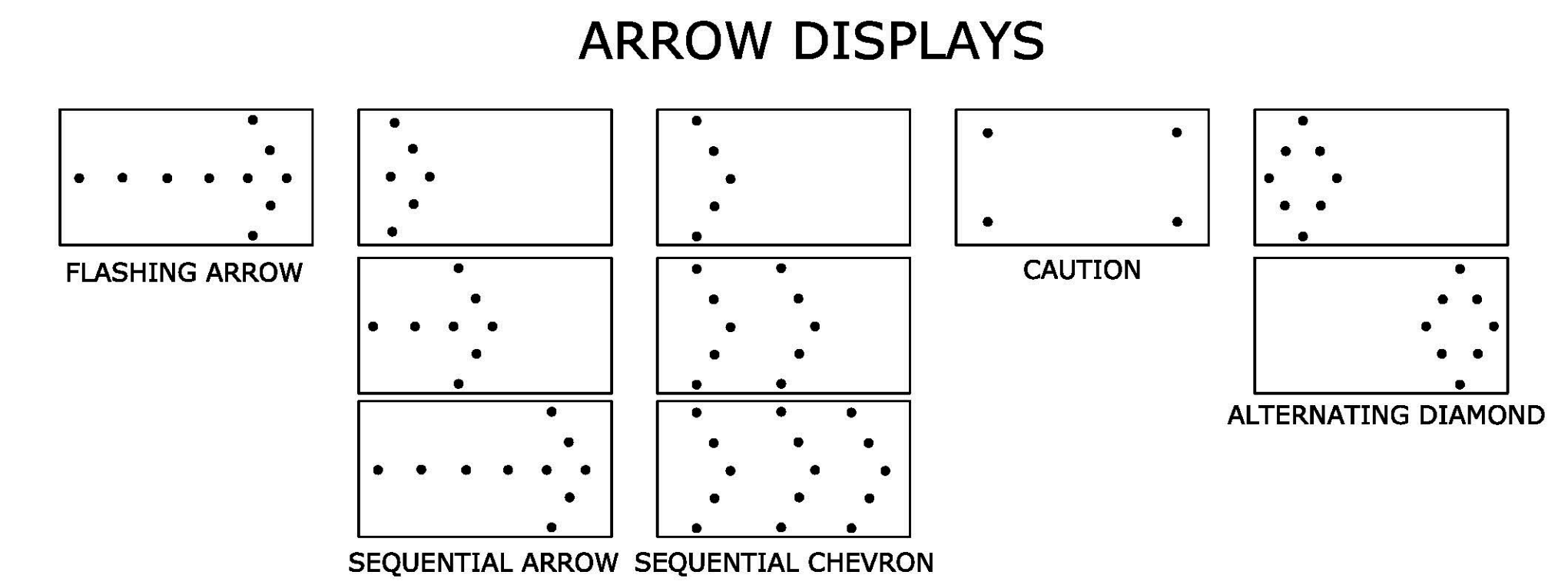
3) CERTIFY THAT THE TRUCK MOUNTED ATTENUATORS (TMA'S) (WHICH ARE DEFINED AS CATEGORY 3 DEVICES BY THE FHWA MEMORANDUM) MEET CURRENT CRASHWORTHY SPECIFICATIONS AS DEFINED ABOVE AND INCLUDE A COPY OF THE ENTIRE FHWA ACCEPTANCE LETTER. ALL CATEGORY 1 & 2 DEVICES SHALL BE NCHRP REPORT 350 OR MASH REPORT 2009 COMPLIANT.

**13. LEAD IN CHANNELIZING DEVICES ON CENTERLINE:**

TEMPORARY RUMBLE STRIPS MAY BE USED IN LIEU OF LEAD IN CENTERLINE CHANNELIZING DEVICES WHEN THE ROADWAY IS LESS THAN OR EQUAL TO 30' (FEET) INCLUDING PAVED SHOULDERS. WHEN EXTENUATING CIRCUMSTANCES EXIST, THE AREA ENGINEER MAY ELECT TO ELIMINATE BOTH THE LEAD IN CHANNELIZERS AND THE RUMBLE STRIPS.

**14. TEMPORARY RUMBLE STRIPS:**

ALTERNATIVE TEMPORARY RUMBLE STRIP OPTIONS MAY BE AVAILABLE. PLEASE CONTACT THE TEMPORARY TRAFFIC CONTROL UNIT FOR MORE INFORMATION AT 785-296-0355 OR 785-296-1183.



ARROW DISPLAY ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING FROM THEIR FULL-RATED LAMP VOLTAGE. FULL LAMP VOLTAGE SHOULD BE USED DURING THE DAY AND DIMMED MODE SHALL BE USED AT NIGHT. FOR SHOULDER WORK, ROADSIDE WORK NEAR THE SHOULDER, BLOCKING THE SHOULDER, OR FOR TEMPORARY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

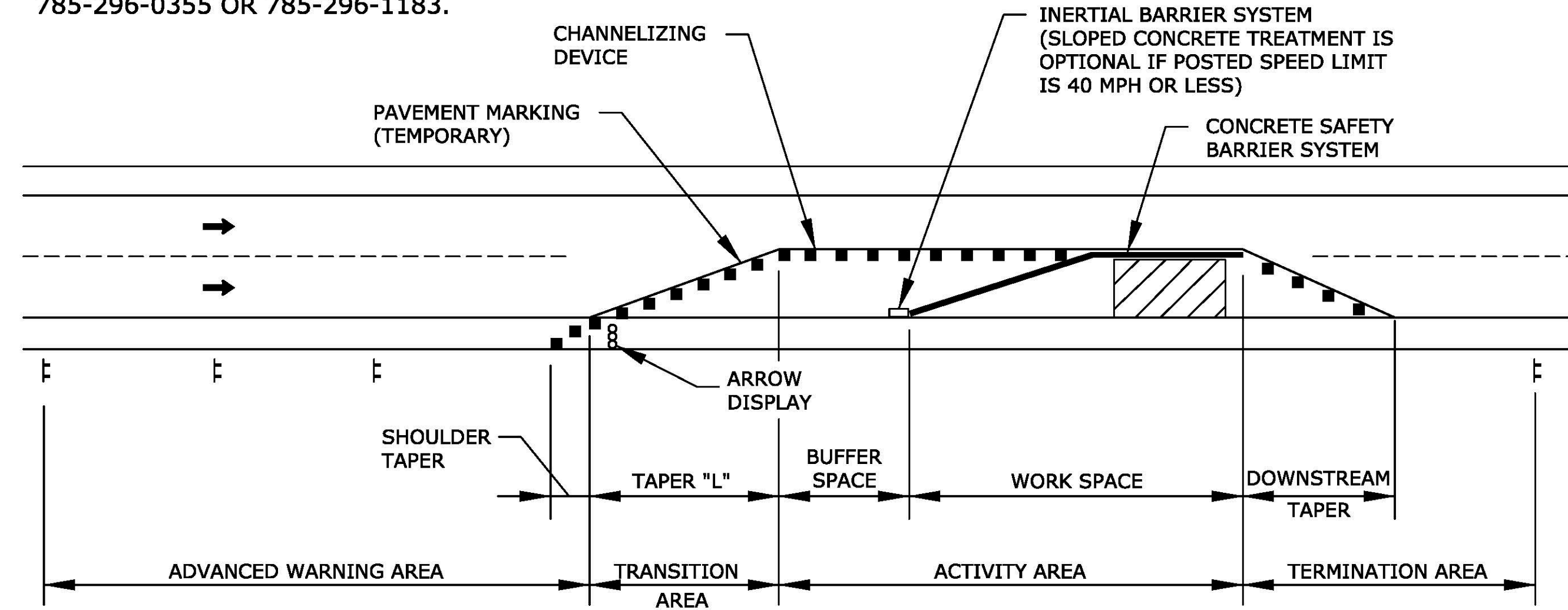
### BUFFER SPACE

SPEED (MPH) *	20	25	30	35	40	45	50	55	60	65	70	75
LENGTH (ft)	115	155	200	250	305	360	425	495	570	645	730	820

\* POSTED SPEED PRIOR TO WORK STARTING

NEITHER WORK ACTIVITY NOR STORAGE OF EQUIPMENT, VEHICLES, OR MATERIAL SHOULD OCCUR IN THE BUFFER SPACE. WHEN A PROTECTION VEHICLE IS PLACED IN ADVANCE OF THE WORK SPACE, ONLY THE SPACE UPSTREAM OF THE VEHICLE CONSTITUTES THE BUFFER SPACE.

IF TEMPORARY CONCRETE SAFETY BARRIER SYSTEM IS USED TO SEPARATE APPROACHING TRAFFIC FROM THE WORK SPACE, THE BARRIER SYSTEM SHALL BE CONSIDERED PART OF THE ACTIVITY AREA. A FULL LANE WIDTH SHOULD BE AVAILABLE THROUGHOUT THE LENGTH OF THE BUFFER SPACE. SEE TYPICAL WORK ZONE COMPONENTS.



NOTE:  
REFER TO STD. TE702 FOR TAPER "L" FORMULA.

### TYPICAL WORK ZONE COMPONENTS

Plotted : 24-OCT-2012 07:53 Traffic  
Drawn By : jmadrid  
File : te700.dgn

SHEET 26 of 29

3	10/16/12	Removed Note 13, Added Alternating Diamonds	J.A.M.	K.P.
2	10/4/11	Modified Notes 9, 12 & 15, Added Note 15	J.A.M.	K.P.
1	11/30/09	Added Note 14	J.A.M.	A.A.A.
NO.	DATE	REVISIONS	BY	APP'D

**KANSAS DEPARTMENT OF TRANSPORTATION**

**GENERAL TRAFFIC CONTROL**

**TE700**

FHWA APPROVAL	10/16/12	APP'D	Kristina Pyle
DESIGNED	B.A.H.	DETAILED	QUANTITIES
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.

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### SIGN LAYOUT INFORMATION



STD. SIZE  
EXPWY/FREEWAY  
6" C  
48"x 24"

KG20-2



STD. SIZE  
EXPWY/FREEWAY  
6" C  
48"x 24"

KG20-5



STD. SIZE  
EXPWY/FREEWAY  
3" C  
24"x 6"

6" C  
48"x 12"

KM4-20



MILEAGE TO BE DETERMINED BY THE ENGINEER.

W7-3a



STD. SIZE  
EXPWY/FREEWAY  
8" D  
48"x 48"

W8-11



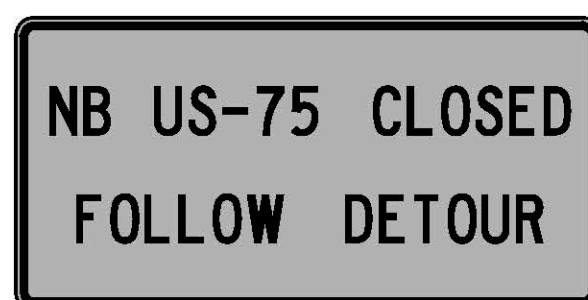
STD. SIZE  
EXPWY/FREEWAY  
48"x 48"

W8-17



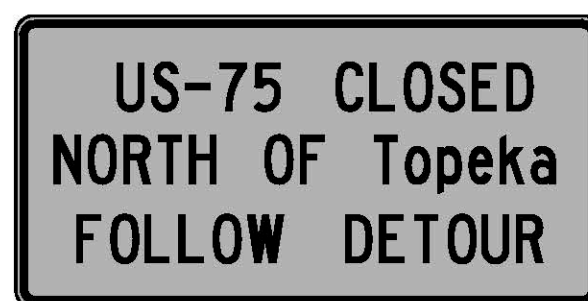
STD. SIZE  
EXPWY/FREEWAY  
30"x 24"

W8-17P  
(OPTIONAL)



STD. SIZE  
EXPWY/FREEWAY  
6" C  
10" D

SP-01  
(SPECIAL SIGN)



STD. SIZE  
EXPWY/FREEWAY  
UPPERCASE: 6" C  
LOWER CASE: 4.5" C  
UPPERCASE: 10" D  
LOWER CASE: 8" D

SP-02  
(SPECIAL SIGN)

ALL CITY NAMES AND STREET NAMES ON SPECIAL SIGNS AND DESTINATION SIGNS MUST HAVE UPPER AND LOWER CASE LETTERS.

ALL SIGNS SHALL BE BLACK ON ORANGE RETROREFLECTIVE SHEETING.

### GENERAL NOTES

#### 1. MAINTENANCE:

THE CONTRACTOR SHALL MAINTAIN ALL SIGNS AND DEVICES IN AN UPRIGHT POSITION. THE CONTRACTOR SHALL CLEAN OR REPLACE ANY DAMAGED OR ILLEGIBLE SIGN OR DEVICE AS DIRECTED BY THE ENGINEER.

#### 2. EXISTING SIGNS:

IF EXISTING SIGNS THAT ARE TO REMAIN (WHETHER DENOTED ON THE PLANS OR NOT) INTERFERE WITH CONSTRUCTION WORK, THE CONTRACTOR SHALL REMOVE, STORE, AND RESET THE SIGNS. THIS SHALL BE SUBSIDIARY TO OTHER TRAFFIC CONTROL BID ITEMS. SIGNING DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

#### 3. CONFLICTING SIGNS, SIGNS NOT IN USE, AND TRAFFIC SIGNALS:

SIGNS AND TRAFFIC SIGNALS THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN OR DO NOT APPLY TO THE TRAFFIC OPERATIONS SHALL BE IMMEDIATELY REMOVED, TURNED SO NOT VISIBLE TO TRAFFIC FROM ANY DIRECTION, OR COMPLETELY COVERED WITH ADEQUATE OPAQUE BREATHABLE MATERIAL. TAPE SHALL NOT BE APPLIED TO THE FACE OF THE SIGN.

#### 4. PORTABLE AND POST MOUNTED SIGNS:

TEMPORARY TRAFFIC CONTROL SIGNS THAT ARE ANTICIPATED TO REMAIN IN PLACE FOR 3 DAYS OR LESS ARE CONSIDERED "PORTABLE." PORTABLE SIGNS SHALL BE MOUNTED ON AN APPROVED SUPPORT AT A MINIMUM HEIGHT OF 12" ABOVE THE TRAVELED WAY. TRAFFIC CONTROL SIGNS IN PLACE FOR OVER 3 DAYS ARE REQUIRED TO BE MOUNTED ON APPROVED POSTS. A MINIMUM OF 42" OF THE APPROVED POST MUST BE BELOW THE GROUND SURFACE WITH ADEQUATE BACKFILL AND COMPACTION. ALL POSTS AT MINIMUM SHALL EXTEND TO THE TOP EDGE OF THE SIGN AND NO GREATER THAN 6" ABOVE THE SIGN.

WHEN THE SIGN WIDTH IS EQUAL TO OR GREATER THAN 9', THREE OR MORE WOOD POSTS MAY BE USED WITH A MINIMUM OF 4' BETWEEN THE CENTERLINE OF EACH POST. ALL SIGNS LESS THAN 9' IN WIDTH SHALL USE A MAXIMUM OF TWO WOOD POSTS.

"ROLL-UP" SIGNS MAY BE USED FOR PORTABLE WARNING SIGNS. THEY MUST BE FLUORESCENT ORANGE ASTM TYPE IV SIGNS OF OPAQUE MATERIAL. MESH SIGNS ARE NOT ALLOWED.

IN THE CASE OF HITTING ROCK WHEN DRIVING POSTS

1. SHIFT THE SIGN LOCATION. DO NOT VIOLATE MINIMUM SIGN SPACING.
2. WITH THE ENGINEER'S APPROVAL, USE ACCEPTABLE ALTERNATIVE SIGN STANDS.

#### 5. SHEETING:

ALL ORANGE SIGNS SHALL HAVE FLUORESCENT ORANGE ASTM TYPE IV SHEETING. ALL OTHER SIGNS SHALL HAVE ASTM TYPE III SHEETING OF STANDARD COLORS.

#### 6. SIGNS INVOLVING SPEEDS:

THE W3-5 (SPEED REDUCTION) SHOULD BE USED ONLY IF THE ENGINEER DETERMINES THAT A REDUCED SPEED IS REQUIRED ON THE PROJECT.

THE KM4-20 (WORK ZONE) PLAQUE SHALL BE PLACED ABOVE ALL SPEED LIMIT SIGNS, (R2-1), EXISTING AND TEMPORARY. MOUNT THE WORK ZONE PLAQUES TO THE POST. DO NOT OVERLAP THE R2-1 AND KM4-20 SIGNS.

FOR SPEEDS OF 30 MPH OR LESS, THE W1-1(TURN) OR W1-3(REVERSE TURN) SHOULD BE USED. FOR SPEEDS OF 35 MPH OR MORE, THE W1-2(CURVE) OR W1-4(REVERSE CURVE) SHOULD BE USED. THE W13-1(MPH) IS TO BE ELIMINATED IF THE ADVISORY SPEED IS WITHIN 5 MPH OF THE SPEED LIMIT.

#### 7. SIGNS CONTROLLING WORK ZONE:

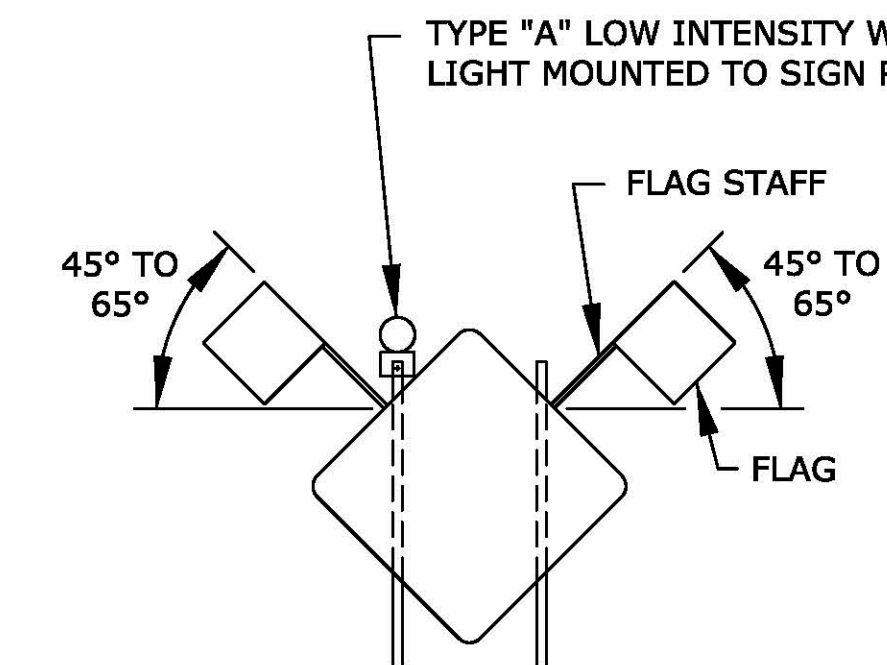
THE KG20-2(END ROAD WORK) SHOULD BE PLACED 500' FROM THE END OF THE ACTUAL WORK SPACE, NOT NECESSARILY AT THE EXTREME LIMITS OF THE PROJECT. THE KG20-2 SHOULD BE MOUNTED ON TWO POSTS. THE KG20-2 MAY BE MOUNTED ON ONE POST IF IN URBAN AREAS WHERE UTILITIES ARE A PROBLEM AND WIND LOADS ARE NOT AN ISSUE.

WHERE TWO WORK ZONES ARE LESS THAN 1 MILE APART IN RURAL AREAS OR ¼ MILE APART IN URBAN AREAS, THE KG20-2(END ROAD WORK) FOR THE FIRST WORK ZONE AND THE W20-1(ROAD WORK) FOR THE SECOND WORK ZONE SHOULD BE ELIMINATED.

#### 8. WARNING LIGHTS ON SIGNS:

A TYPE "A" LOW INTENSITY WARNING LIGHT IS AN L.E.D. BI-DIRECTIONAL FLASHING WORK ZONE WARNING LIGHT. TYPE "A" LOW INTENSITY WARNING LIGHTS SHOULD BE USED WITH ALL CONSTRUCTION ACTION WARNING SIGNS AND SHALL NOT BE USED ON SIGNS MOUNTED LESS THAN 5' HIGH ON TEMPORARY SUPPORTS. ON ALL OTHER CONSTRUCTION WARNING SIGNS, TYPE "A" LOW INTENSITY WARNING LIGHTS ARE TO BE USED AS DIRECTED BY THE ENGINEER.

TYPE "A" LOW INTENSITY WARNING LIGHTS SHALL BE MAINTAINED SO AS TO BE CAPABLE OF BEING VISIBLE ON A CLEAR NIGHT FROM A DISTANCE OF 3000 FT. IF A TYPE "A" LOW INTENSITY WARNING LIGHT HAS A SEPARATE BATTERY CASE, THE BATTERY CASE SHALL BE MOUNTED NO HIGHER THAN 12" ABOVE THE GROUND AND MOUNTED BEHIND THE SIGN POST. A TYPE "A" LOW INTENSITY WARNING LIGHT WHERE THE LENS AND BATTERY ARE ONE UNIT SHALL BE MOUNTED ON THE TEMPORARY SIGN POST NEAREST TO THE TRAVELED WAY. FLAGS SHALL NOT INTERFERE WITH THE VISABILITY OF THE TYPE "A" LOW INTENSITY WARNING LIGHT.



TWO (2) 18" x 18" FLUORESCENT RED-ORANGE FLAGS SHALL BE ATTACHED (IN THE POSITION SHOWN) ON THE W20-2(DETOUR), W1-1(TURN), W1-2(CURVE), W1-3(REVERSE TURN), W1-4(REVERSE CURVE), W3-3(SIGNAL AHEAD), W4-2(LANE REDUCTION), W20-4(ONE LANE ROAD), W20-5(LANE CLOSED), W20-7A(FLAGGER), AND W3-4 (BE PREPARED TO STOP) SIGNS AND ANY OTHER ACTION SIGNS AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. THE FLAGS AND STAFFS ARE TO BE ATTACHED IN SUCH A MANNER THAT THE SIGN WILL NOT BE OBSCURED. THE FLAGS MAY BE EITHER A CLOTH OR VINYL MATERIAL. THE FLAGS SHALL BE SUBSIDIARY TO THE CONSTRUCTION SIGN BID ITEMS.

#### MINIMUM ADVANCE WARNING SIGN SPACING (IN FEET):

	A	B	C
URBAN (40 MPH OR LOWER)	100	100	100
URBAN (45 MPH OR HIGHER)	350	350	350
RURAL (55 MPH OR LOWER)	500	500	500
RURAL (60 MPH OR HIGHER)	750	750	750
EXPRESSWAY/FREEWAY	1000	1500	2640

THE MINIMUM SPACING BETWEEN SIGNS SHALL BE NO LESS THAN 100', UNLESS DIRECTED BY THE ENGINEER.

THE SPACING BETWEEN ANY SIGNS MAY BE INCREASED BEYOND THE MINIMUM VALUES IN THE TABLE ABOVE AS APPROVED BY THE ENGINEER IN ORDER TO MAXIMIZE VISIBILITY.

SHEET 27 of 29

3	10/16/12	Removed Note 9, Modified Sign Layout Detail	J.A.M.	K.P.
2	10/4/11	Modified Note 3	J.A.M.	K.P.
1	2/24/10	Modified AFAD Note	J.A.M.	A.A.A.
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGNS

TE710

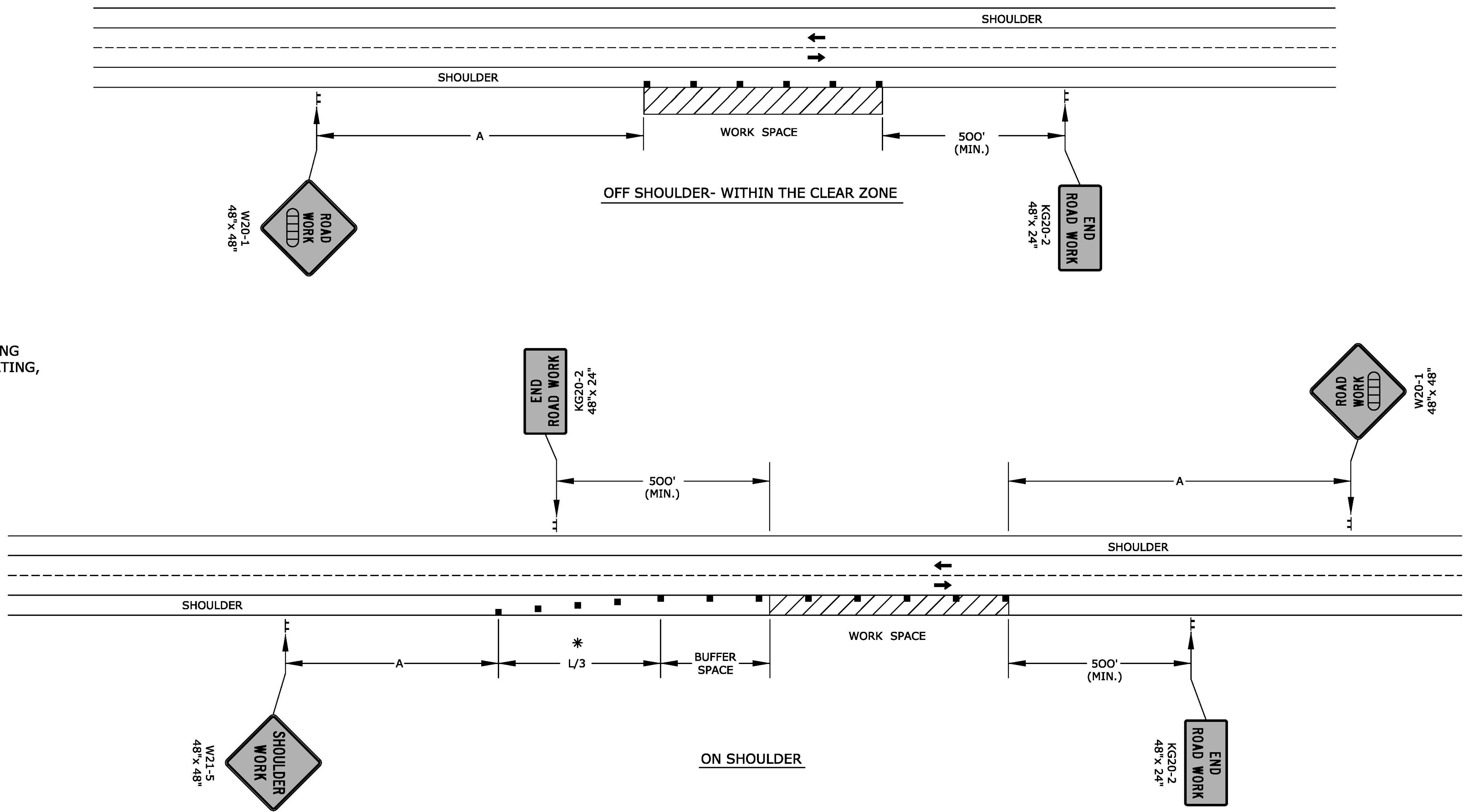
DESIGNED	B.A.H.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.		

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Sh. No. XXX



REFER TO STD. TE710 FOR ADDITIONAL INFORMATION ON TEMPORARY TRAFFIC CONTROL SIGNS AND SIGN SPACING.  
 REFER TO STD. TE702 FOR INFORMATION ON TAPERS AND CHANNELIZING DEVICES.  
 REFER TO STD. TE700 FOR LENGTH OF BUFFER SPACE.



**NOTES:**

NO TRAFFIC CONTROL IS REQUIRED IF THE WORK SPACE IS LOCATED OUTSIDE OF THE CLEAR ZONE.

FOR OPERATIONS OF 60 MINUTES OR LESS, ALL SIGNS AND CHANNELIZING DEVICES MAY BE ELIMINATED IF A VEHICLE WITH HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS IS USED.

WHEN CONCRETE BARRIER SYSTEM IS USED, PORTABLE CHANNELIZING DEVICES ARE NOT NEEDED ALONG THE TANGENT BARRIER SECTION. DELINEATION ON THE BARRIER SYSTEM IS STILL REQUIRED. SEE RD622.

\* OMIT TAPER IF PAVED SHOULDER IS LESS THAN 8' WIDE.

- CHANNELIZING DEVICE
- AHEAD, 1500 FT, OR 1 MILE

Plotted : 24-OCT-2012 07:54 Traffic  
 Drawn By : jmadrid  
 File : te720.dgn

SHEET 28 of 29

NO.	DATE	REVISIONS	BY	APP'D
3	10/16/12	Modified Shoulder Detail	J.A.M.	K.P.
2	4/20/09	Combined And Moved General Notes	J.A.M.	A.A.A.
1	8/8/07	G20-2 Changed To KG20-2	M.B.	A.A.A.

**KANSAS DEPARTMENT OF TRANSPORTATION**  
**TYPICAL TRAFFIC CONTROL**  
**WORK ON OR NEAR THE SHOULDER**  
**UNDIVIDED HIGHWAY (2 OR 4 LANE)**

**TE720**

DESIGNED	L.E.R.	DETAILED	B.A.H.	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.		

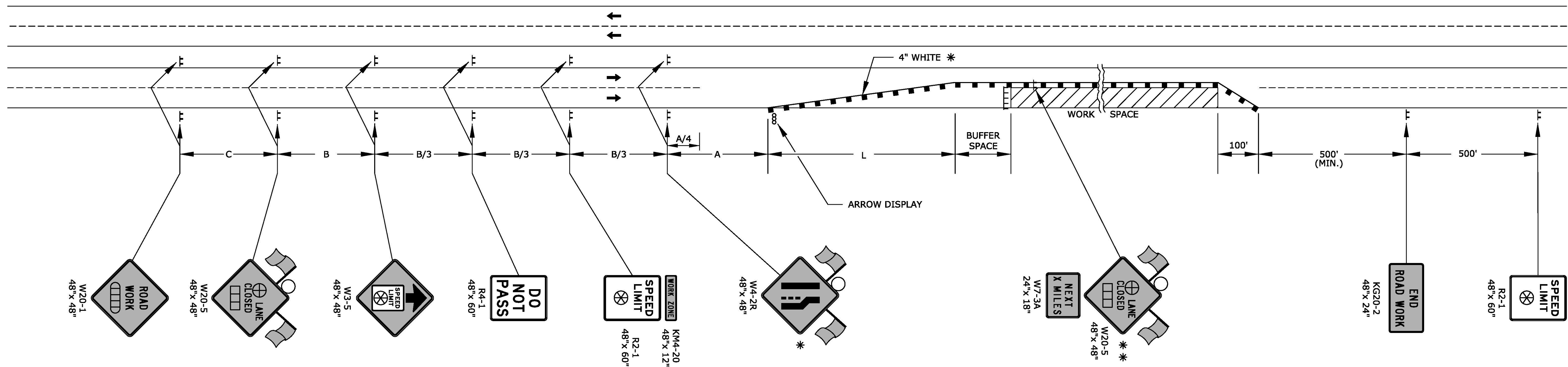
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STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	XX-XX XX-XXXX-XX	XXXX	XXX	XXX

REFER TO STD. TE710 FOR ADDITIONAL INFORMATION ON TEMPORARY TRAFFIC CONTROL SIGNS AND SIGN SPACING.  
REFER TO STD. TE704 FOR TYPE III BARRICADES.  
REFER TO STD. TE702 FOR INFORMATION ON TAPERS AND CHANNELIZING DEVICES.  
REFER TO STD. TE700 FOR LENGTH OF BUFFER SPACE.



LEFT-SIDE SIGNS SHALL BE OMITTED FOR A FOUR-LANE UNDIVIDED HIGHWAY.

\* FOR LEFT LANE CLOSURES USE W4-2L AND YELLOW EDGE LINE ALONG CHANNELIZING DEVICES.

\*\* THE W20-5 (⊕ LANE CLOSED) AND W7-3A (NEXT X MILES) SIGNS SHOULD BE PLACED AT 2 MILE INCREMENTS ON A PROJECT OF 4 MILES OR LONGER.

- ||| TYPE III BARRICADES
- X LENGTH TO THE NEAREST WHOLE MILE
- CHANNELIZING DEVICE
- ▭ AHEAD, 1500 FT, OR 1 MILE
- ▭ AHEAD, 1000 FT, 1500 FT, OR 1/2 MILE
- ⊕ RIGHT OR LEFT
- ⊗ SPEED TO BE DETERMINED BY THE ENGINEER
- TYPE "A" LOW INTENSITY WARNING LIGHT

SHEET 29 of 29

3	8/8/07	Sign Spooling Changed	M.B.	A.A.A.
2	12/29/05	M4-20 Changed To KM4-20	M.B.	A.A.A.
1	2/1/05	Clarified Notes, Updated Warning Signs	B.H.	A.A.A.
NO.	DATE	REVISIONS	BY	APP'D

**KANSAS DEPARTMENT OF TRANSPORTATION**  
**TYPICAL TRAFFIC CONTROL**  
**FOUR-LANE HIGHWAY**  
**ONE LANE CLOSED**

**TE744**

FHWA APPROVAL	8/8/07	APP'D	Anthony Alarbalre
DESIGNED	B.A.H.	DETAILED	QUANTITIES
DESIGN CK.	DETAIL CK.	QUAN. CK.	TRACE CK.

Plotted : 24-OCT-2012 07:54  
Traffic

Drawn By : jmadrid  
File : te744.dgn