

June 7, 2016

Lance Kippen
Manager Industry & Public Projects
Union Pacific Railroad
1400 W 52 Avenue
Denver, CO 80221

RE: **30% UPRR York Street Crossing Plans**
CDOT Central 70 Project
At-Grade Crossing York Street, Denver, CO
MP 2.98: Greeley Subdivision (36th Yard)
DOT # 804-422R

With this letter CDOT is pleased to formally submit the 30% UPRR York Street Crossing Plans for UPRR review and approval. These plans include items discussed at the May 12, 2016 on site field diagnostic meeting with the CPUC. Modifications to the existing at-grade crossing are required as part of the overall Central 70 reconstruction project. Specifically, York Street will be widened at the crossing to provide for a new southbound left turn lane to 47th Avenue and reconstructed sidewalk crossings. Also, a new traffic signal will be constructed at York Street and 47th Ave that will be interconnected to the at-grade crossing warning devices with preemption timing.

As discussed, this project will be constructed under a design-build alternative delivery method. The at-grade crossing's roadway, sidewalk, traffic signal, and drainage will be designed to a 100% level by the Central 70 design-build Developer and approved by UPRR prior to any construction. The at-grade crossing modifications to replace the warning devices including preemption signal interconnection timing and calculations are designed to 100% level with this submittal to allow UPRR to create a signal design and cost estimate. The signed Highway Rail Grade Crossing Traffic Signal Preemption Request Form and the Signal Warning Device Memo with timing calculations are attached for review and approval.

The at-grade crossing modifications to replace and add crossing panels for the York Street crossing widening will be designed to 100% level as part of the 36th Yard Track Reconstruction phasing by the CDOT Central 70 Team, with construction performed by UPRR forces with the 36th Yard Track Reconstruction.

As part of this 30% UPRR York Street Crossing plan package, applicable proposed roadway, sidewalk, traffic signal, drainage, and at-grade crossing information has been provided for UPRR approval.

This 30% UPRR York Street Crossing Plan package will be included in the Central 70 Project Request for Proposals (RFP). In addition, the following design requirements are included in the Central 70 Project RFP:

1. The Developer shall coordinate with UPRR for all drainage related issues as related to Construction Work on Railroad right-of-way, as described in Schedule 10, Section 8 of the RFP.
2. The design maintains the existing York Street profile grade through the at-grade crossing and intersection with 47th Avenue.



3. The Developer shall provide interconnected traffic signals at York Street & 47th Ave with southbound signal preemption for the at-grade crossings per the MUTCD and Public Utilities Commission requirements, as described in Schedule 10, Section 10 of the RFP.
4. Lighting and Intelligent Transportation Systems (ITS) are included as part of Construction Work and will be designed and constructed by the Developer.
5. The Developer shall perform all Construction Work crossing the UPRR ROW in accordance with plans and specifications that will include UPRR's approval, in accordance to Schedule 10, Section 10 of the RFP.
6. The Developer shall obtain UPRR approval, in writing, in advance of construction activities, on methods and procedures for all Construction Work, in accordance to Schedule 10, Section 10 of the RFP.

I am available to discuss and answer any questions that you may have regarding this submittal. Our team is available for a review meeting and we can discuss in detail the proposed design.

Sincerely,

Ron Dickey
Central 70 Railroad Manager

Cc: Keith Stefanik, Central 70 Design Manager
Dan Liddle, Atkins



PoDI / NHS

FHWA PROJECT OF DIVISION INTEREST (PoDI)? NO YES

NATIONAL HIGHWAY SYSTEM? NO YES

DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

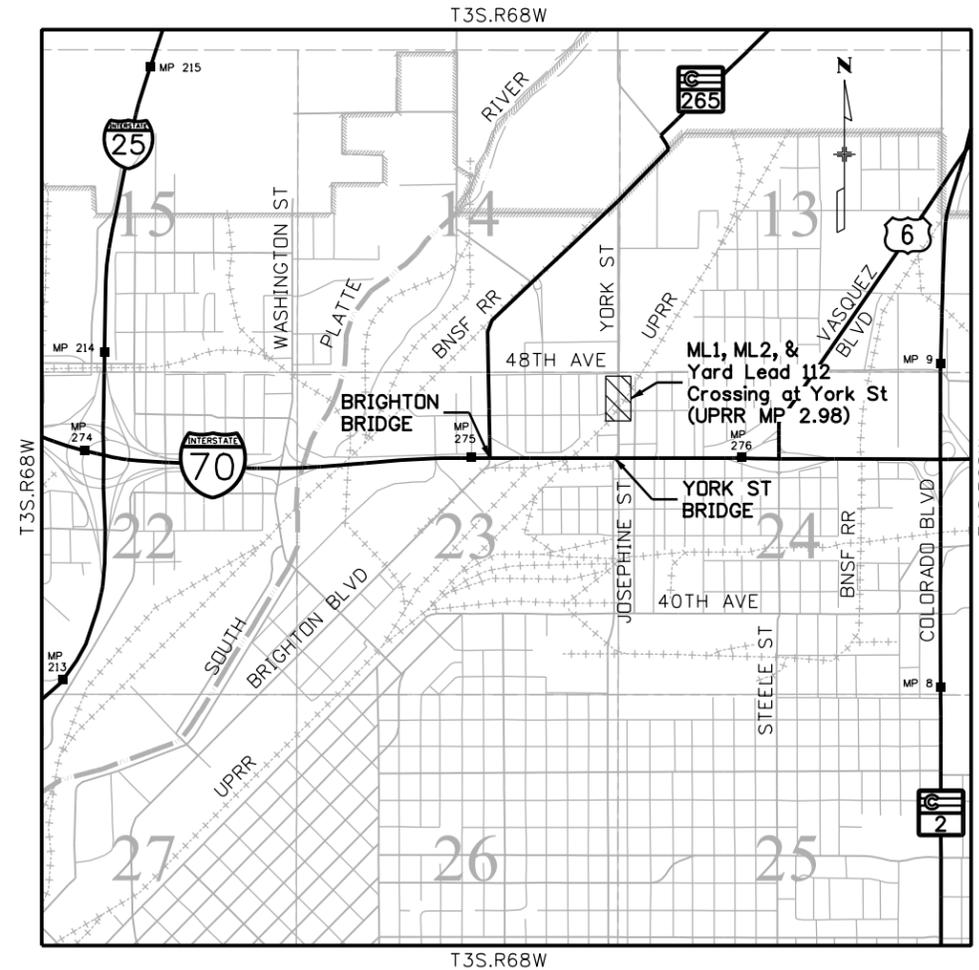
HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED
FEDERAL AID PROJECT NO. FBR 0704-234
YORK STREET AT-GRADE CROSSING WITH UPRR
DENVER COUNTY
CONSTRUCTION PROJECT CODE NO. 19631
UPRR MP 2.98: GREELEY SUBDIVISION (36TH YARD); DOT #804-422R

Related Projects:
P. E. UNDER PROJECT: FBR 0704-234
Project Number: 19631
Project Code:

R.O.W. Projects:
R.O.W. Project Description

SHEET NO.

INDEX OF SHEETS
TITLE SHEET, INDEX OF PLANS
ROADWAY PLAN SHEETS
ROADWAY PROFILE SHEETS
DRAINAGE PLANS
TRAFFIC SIGNAL PLANS
UPRR YORK ST CROSSING SHEETS



PROJECT LOCATION MAP



**UPRR YORK STREET
CROSSING PLANS
30% SUBMITTAL**
June 3, 2016

Print Date: 6/3/2016	0000
File Name: 19631DES_UPRRyork_Title001.dgn	
Horiz. Scale: 1:3000 Vert. Scale: As Noted	
Unit Information Unit Leader Initials	
ATKINS 7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



2000 South Holly Street
Denver, CO 80222
Phone: 303-757-9934 FAX: 303-757-9907

Region 1 KJS



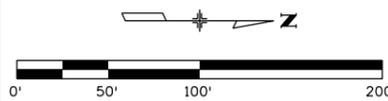
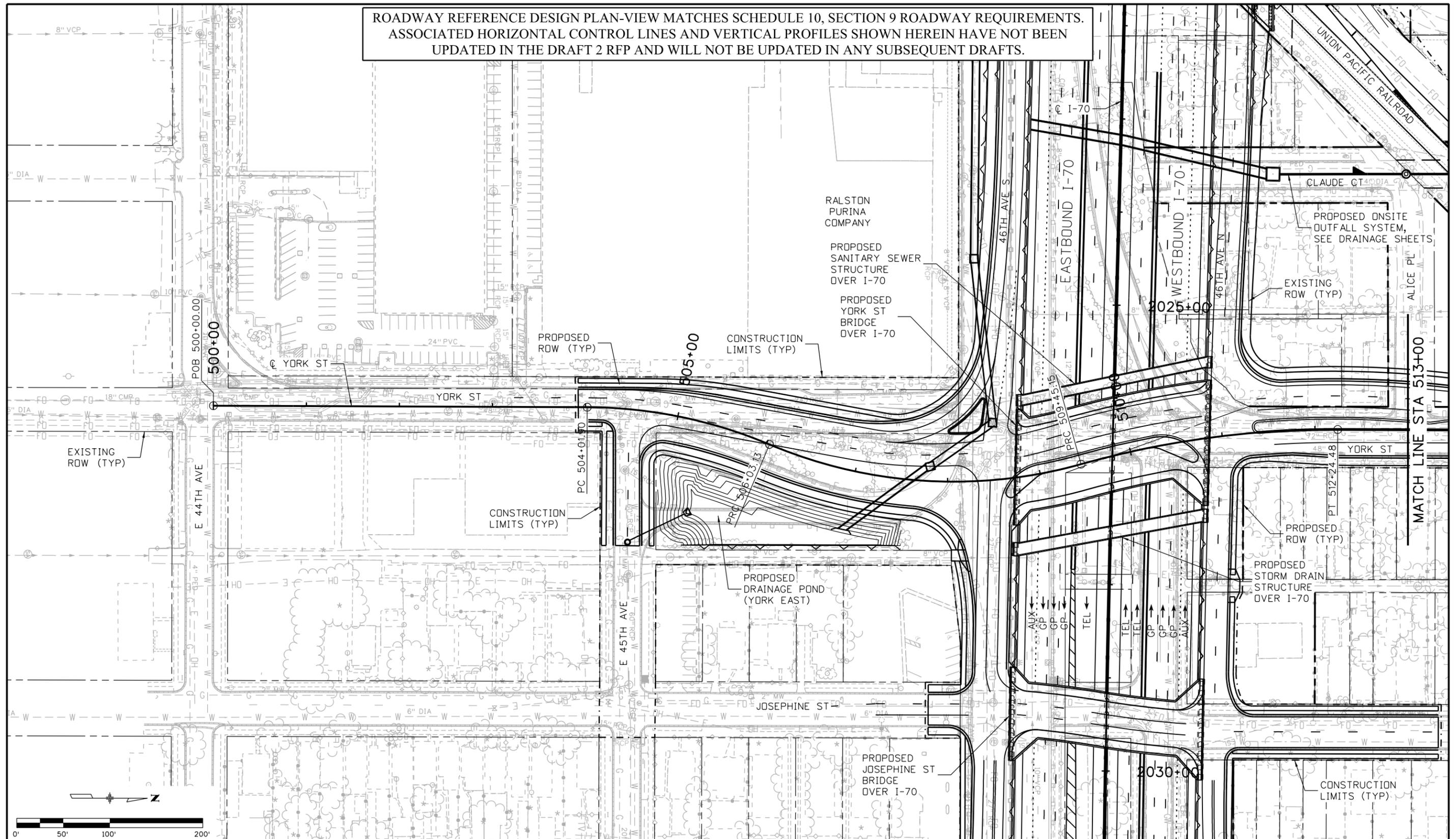
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Contract Information	
Contractor:	_____
Resident Engineer:	_____
Project Engineer:	_____
PROJECT STARTED: ___/___/___	ACCEPTED: ___/___/___
Comments:	_____

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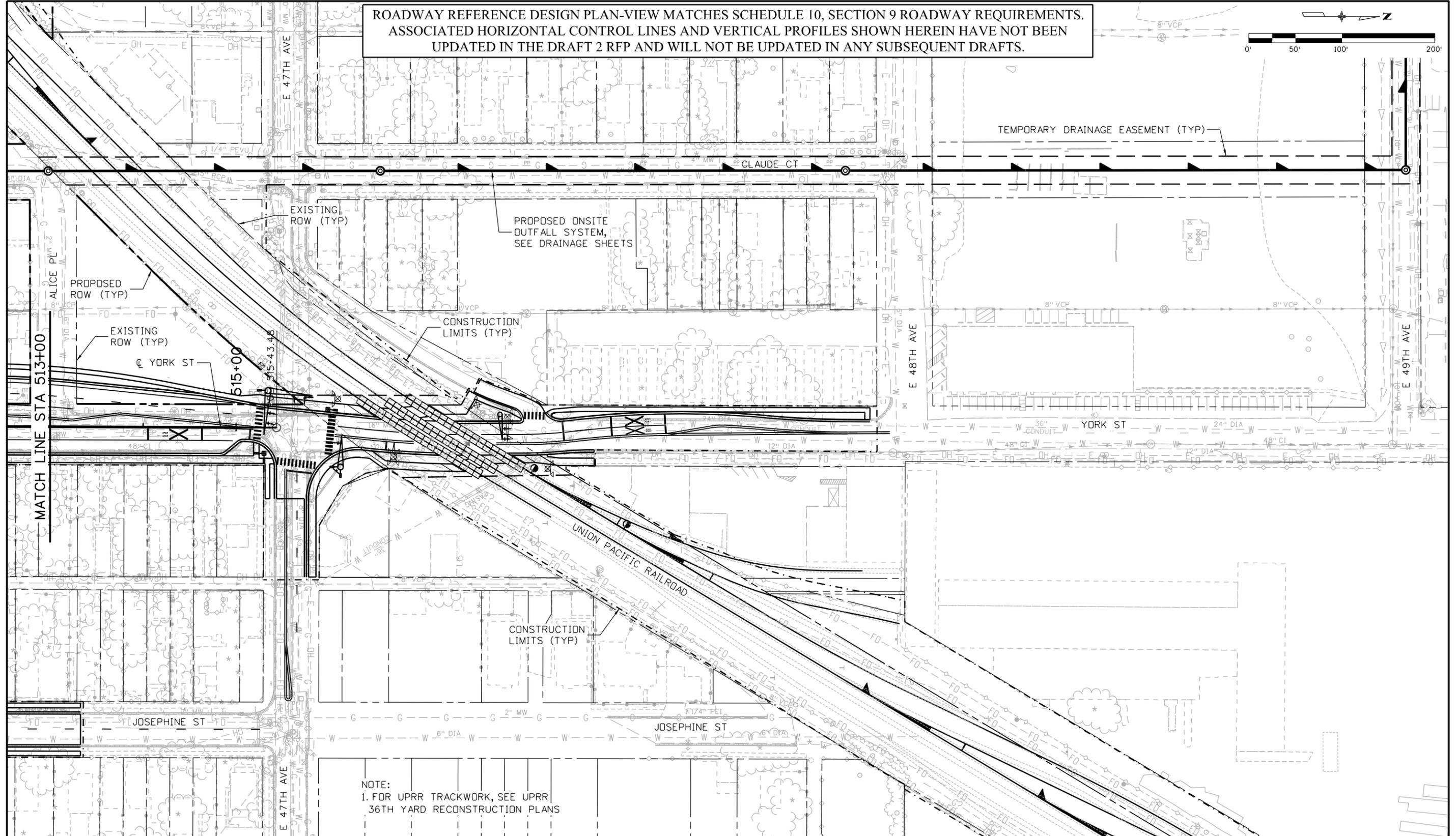
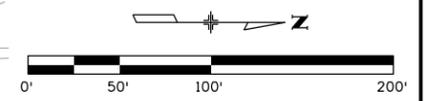
ROADWAY REFERENCE DESIGN PLAN-VIEW MATCHES SCHEDULE 10, SECTION 9 ROADWAY REQUIREMENTS.
 ASSOCIATED HORIZONTAL CONTROL LINES AND VERTICAL PROFILES SHOWN HEREIN HAVE NOT BEEN
 UPDATED IN THE DRAFT 2 RFP AND WILL NOT BE UPDATED IN ANY SUBSEQUENT DRAFTS.



Print Date: 6/3/2016		Sheet Revisions		Colorado Department of Transportation		PRELIMINARY		YORK STREET ROADWAY PLAN		Project No./Code	
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Unit Information					KJS		Void:		Detailer:		Sheet Number
Unit Leader Initials									Sheet Subset: Rdwy Plan		Subset Sheets: 44 of 137
ATKINS		7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276								Sheet Number	

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ROADWAY REFERENCE DESIGN PLAN-VIEW MATCHES SCHEDULE 10, SECTION 9 ROADWAY REQUIREMENTS.
 ASSOCIATED HORIZONTAL CONTROL LINES AND VERTICAL PROFILES SHOWN HEREIN HAVE NOT BEEN
 UPDATED IN THE DRAFT 2 RFP AND WILL NOT BE UPDATED IN ANY SUBSEQUENT DRAFTS.



NOTE:
 1. FOR UPRR TRACKWORK, SEE UPRR
 36TH YARD RECONSTRUCTION PLANS

Print Date: 6/3/2016	
File Name: I3599DES_Procurement_Plan 45_Base_York St.dgn	
Horiz. Scale: 1:100	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
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Sheet Revisions		
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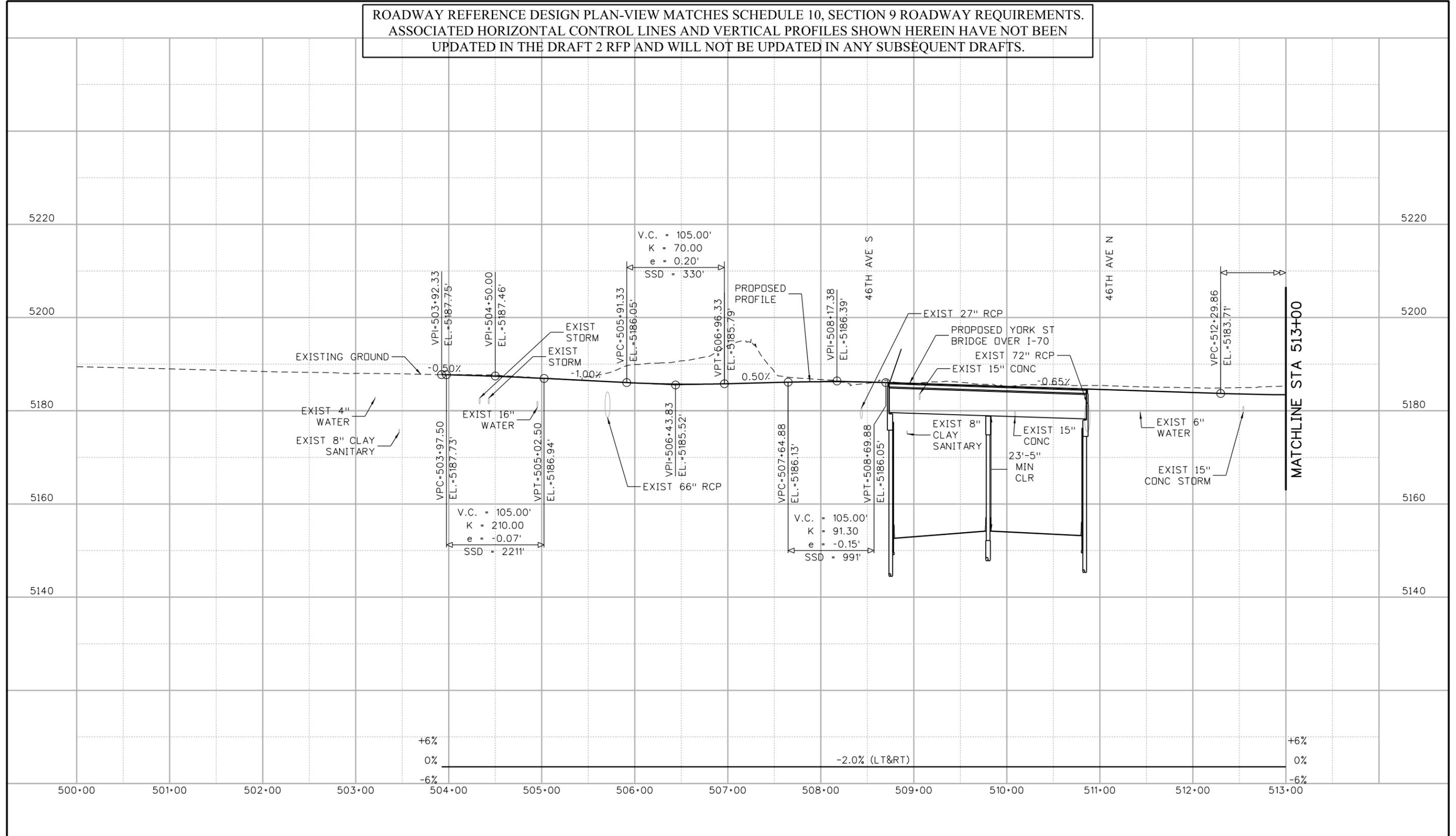
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Unit Information	Unit Leader Initials
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Sheet Revisions		
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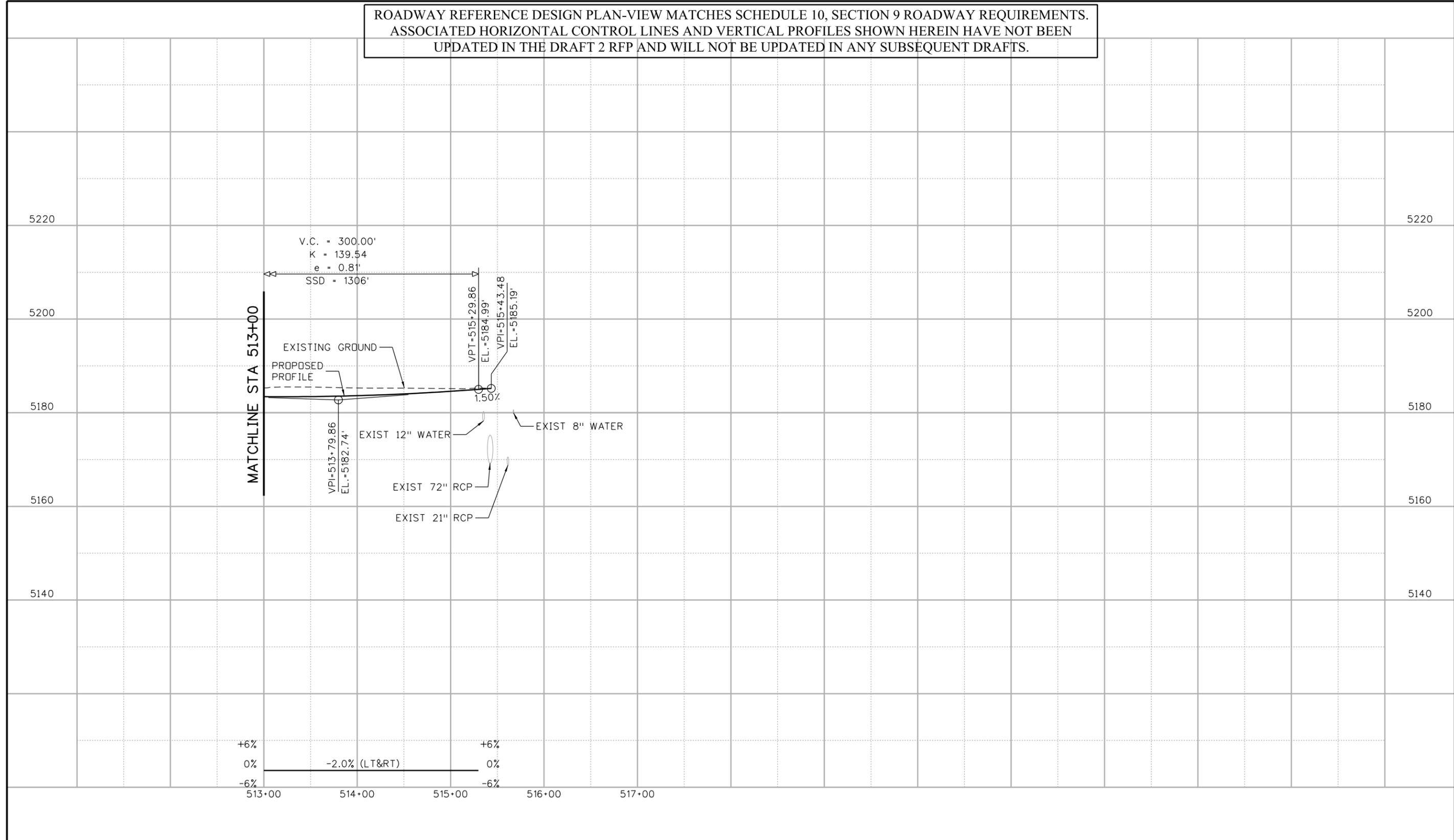
**YORK STREET
 ROADWAY PROFILE
 STA 500+00 TO 513+00**

Designer:
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 Sheet Subset: Rdwy Prof

Structure Numbers:
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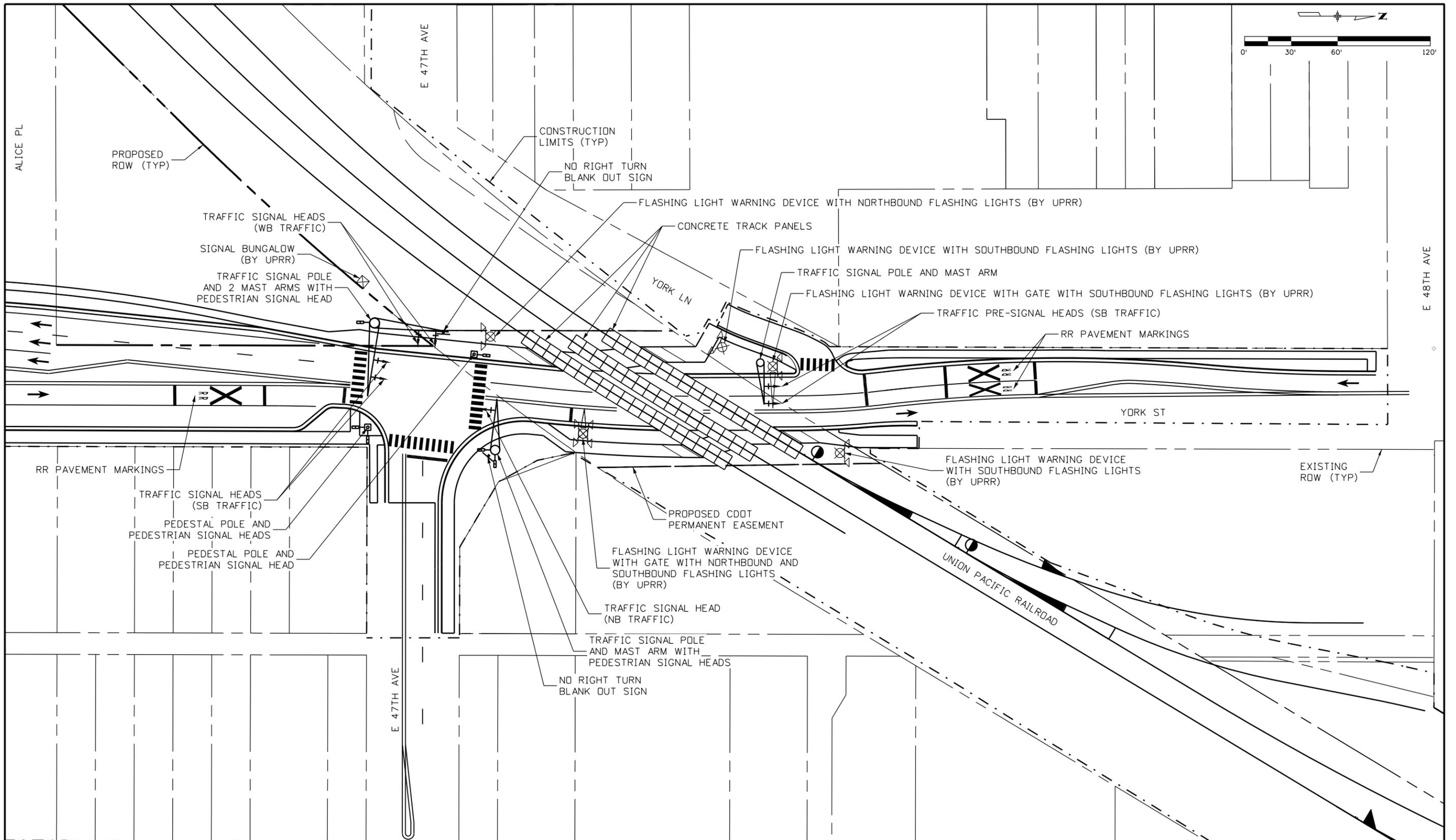
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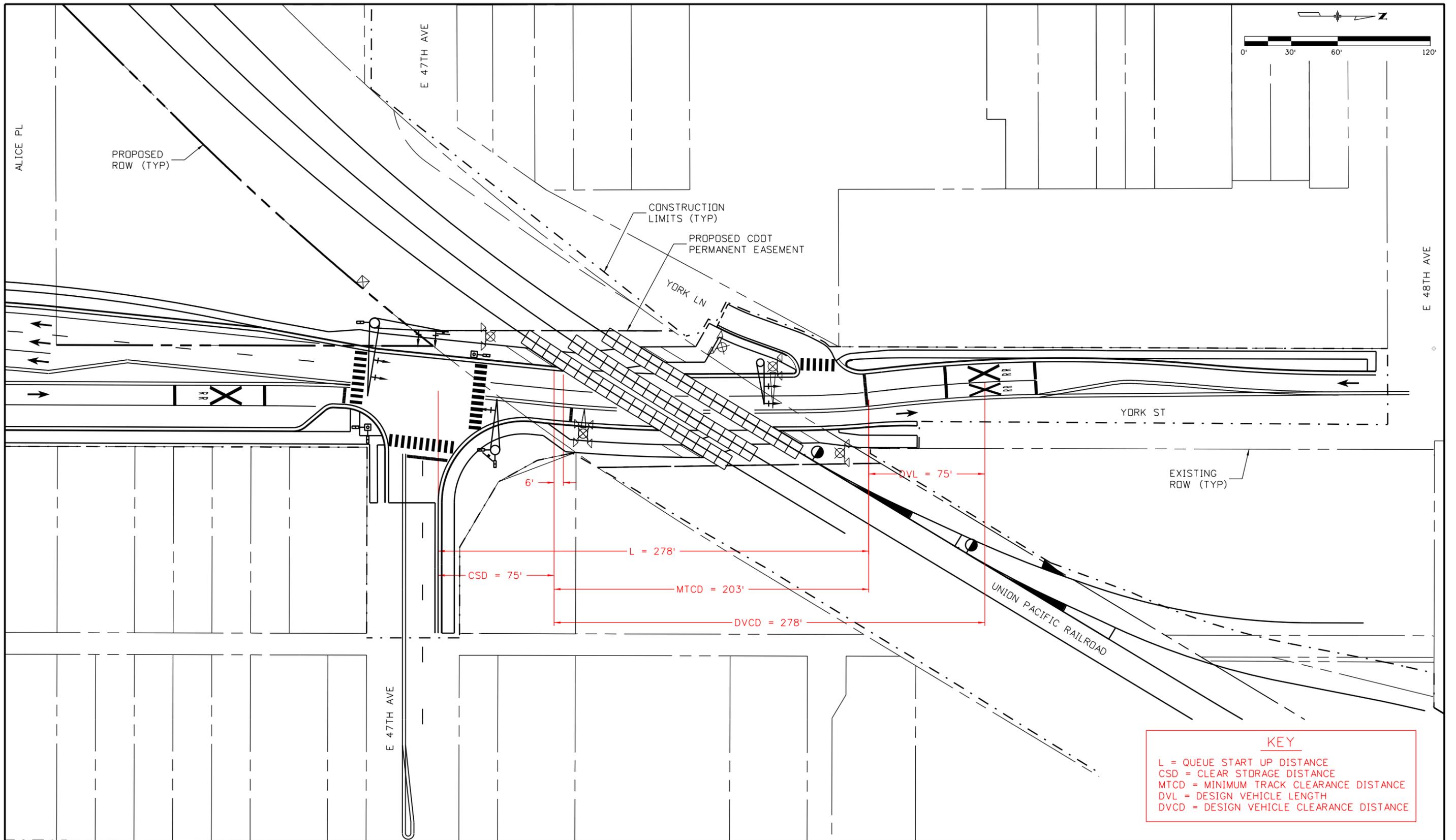
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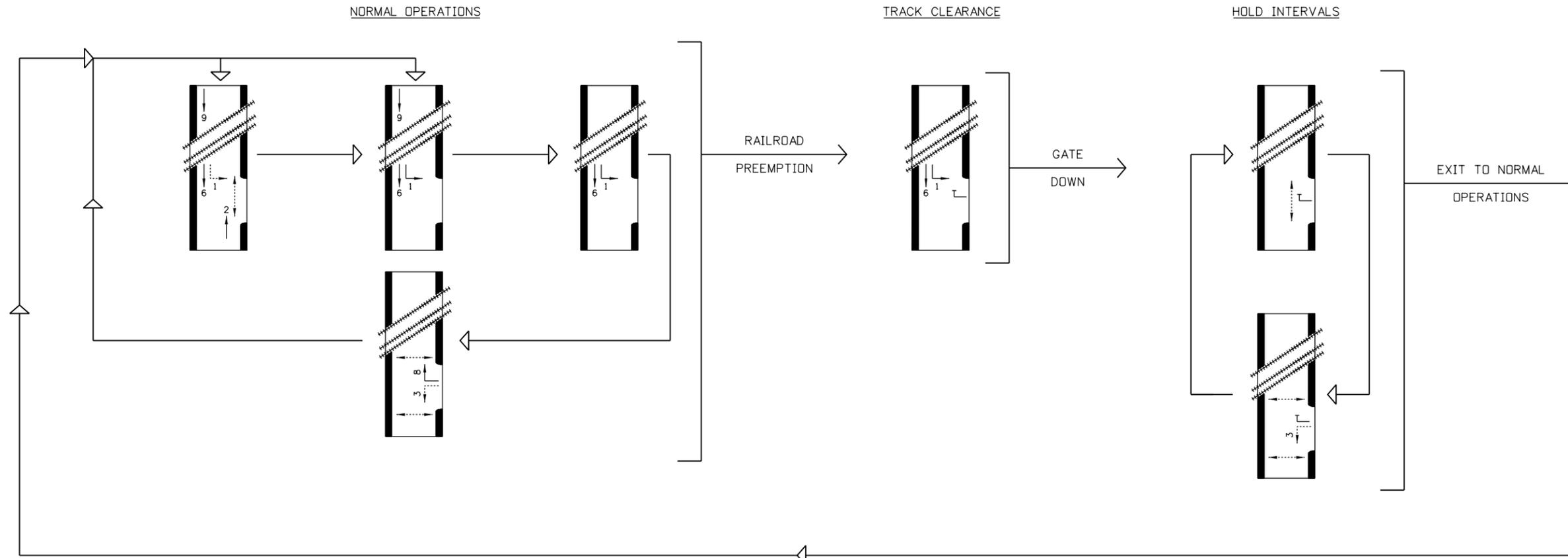
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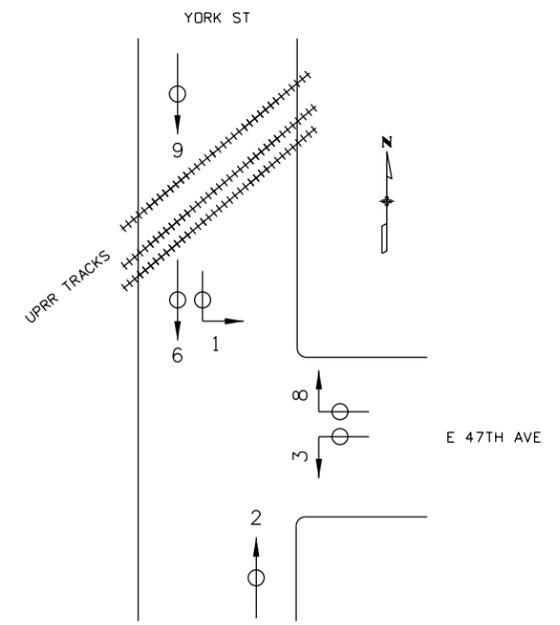


KEY
 L = QUEUE START UP DISTANCE
 CSD = CLEAR STORAGE DISTANCE
 MTCD = MINIMUM TRACK CLEARANCE DISTANCE
 DVL = DESIGN VEHICLE LENGTH
 DVCD = DESIGN VEHICLE CLEARANCE DISTANCE

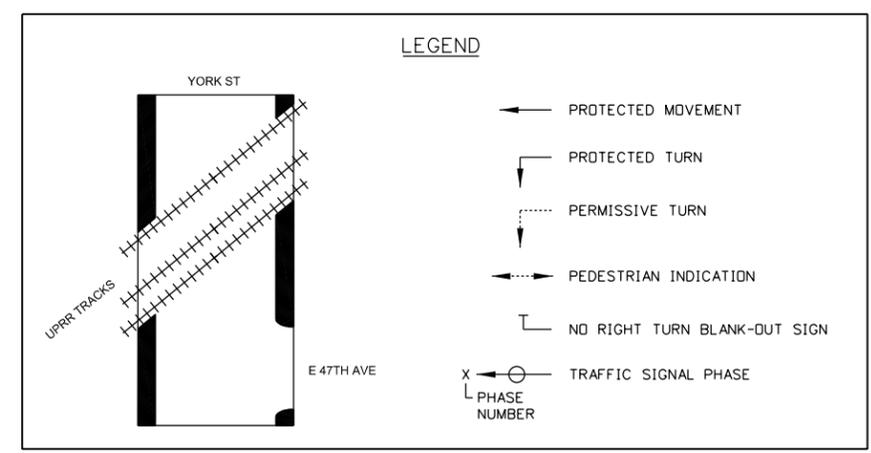
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Unit Information Unit Leader Initials								Subset Sheets: 2 of 2			
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PHASE DIAGRAM



MAP SCHEMATIC



Print Date: 6/3/2016
 File Name: UPRR Phase Diagram_York-47th Ave_Exhibit 01.dgn
 Horiz. Scale: 1:60 Vert. Scale: As Noted
 Unit Information Unit Leader Initials
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 Denver, CO 80237
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Sheet Revisions		
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Region 1 **KJS**

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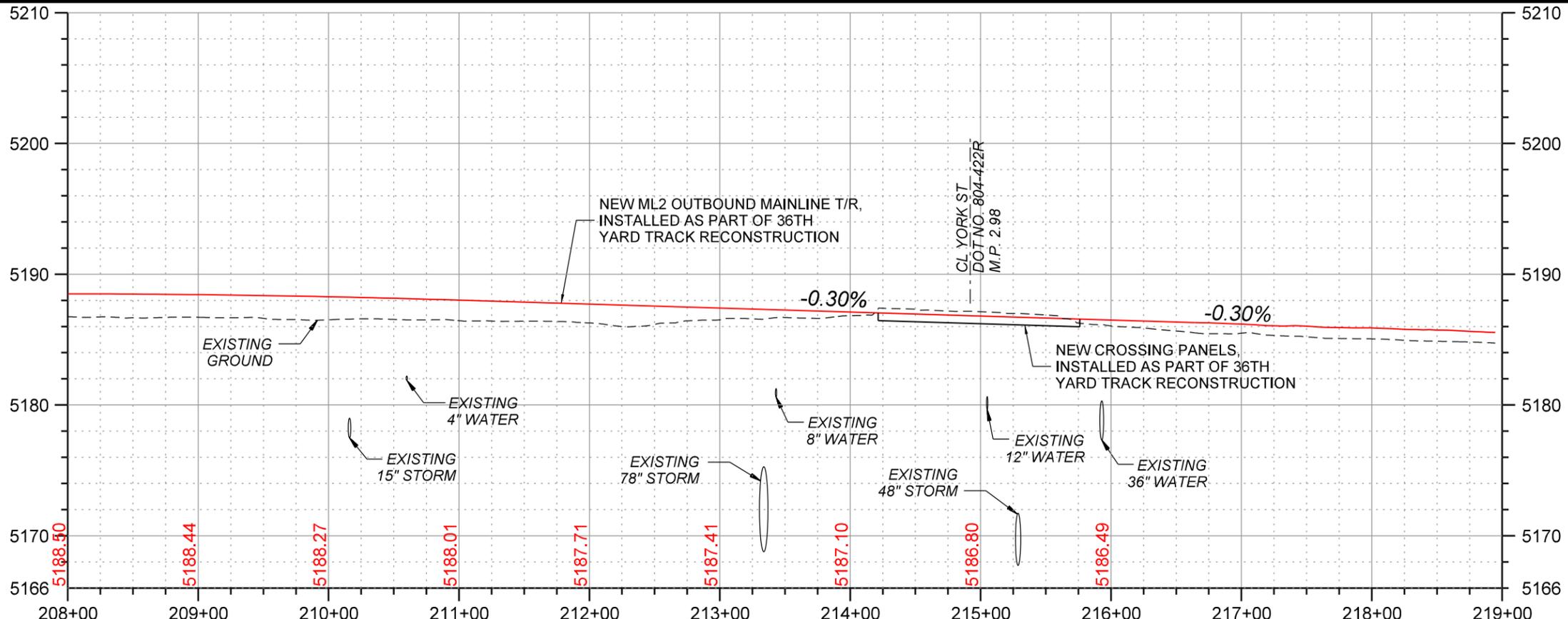
UPRR TRACK CROSSING OF YORK ST AT 47TH AVE PHASE DIAGRAM

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 Detailer:
 Sheet Subset: PhaseDiagram

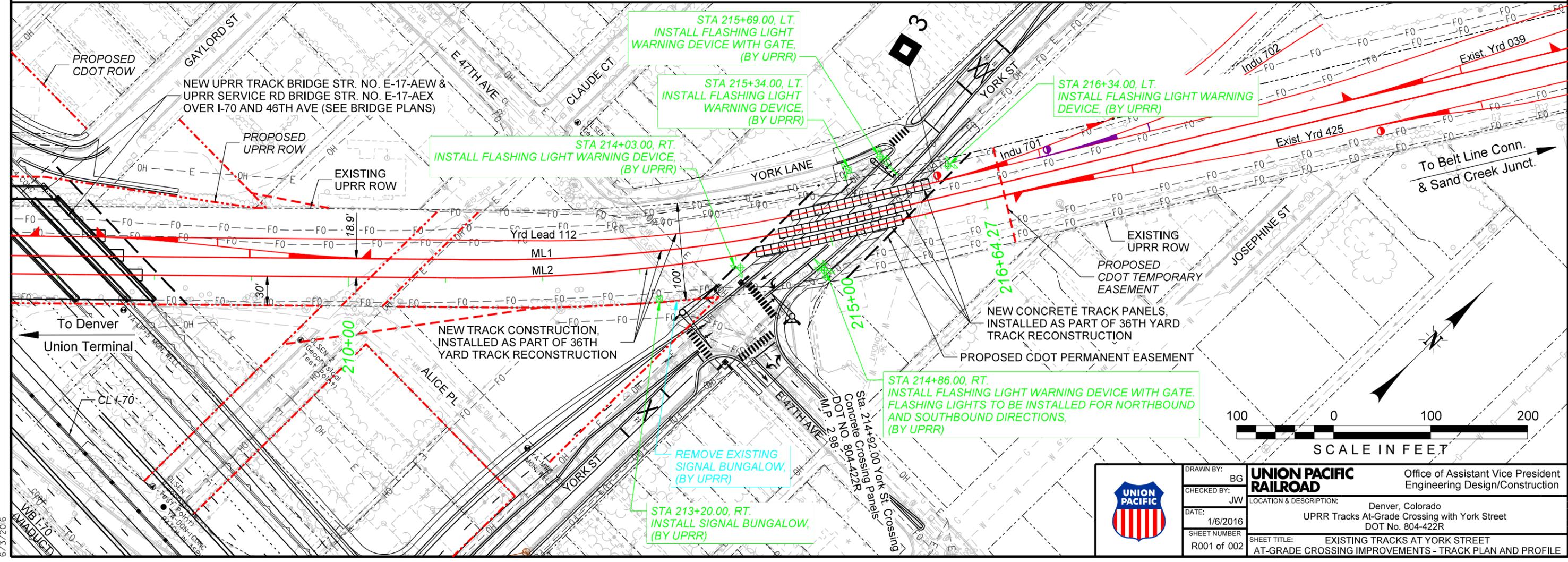
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Project No./Code
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 Sheet Number

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- NOTES:**
1. THE TRAFFIC SIGNAL CONTRACTOR SHALL WORK WITH UPRR FORCES TO ESTABLISH TRAFFIC SIGNAL INTERCONNECT WITH NEW RAILROAD SIGNAL EQUIPMENT, AND BUNGALOW.
 2. SEE 40 SCALE TRACK PLAN FOR GENERAL CONSTRUCTION NOTES AND ADDITIONAL INFORMATION.



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	DRAWN BY: BG	UNION PACIFIC RAILROAD Office of Assistant Vice President Engineering Design/Construction
	CHECKED BY: JW	
	DATE: 1/6/2016	
	SHEET NUMBER: R001 of 002	
LOCATION & DESCRIPTION: Denver, Colorado UPRR Tracks At-Grade Crossing with York Street DOT No. 804-422R		SHEET TITLE: EXISTING TRACKS AT YORK STREET AT-GRADE CROSSING IMPROVEMENTS - TRACK PLAN AND PROFILE

NOTE:
 1. THE CONTRACTOR SHALL WORK WITH UPRR FORCES TO ESTABLISH TRAFFIC SIGNAL INTERCONNECT WITH NEW RAILROAD SIGNAL EQUIPMENT AND BUNGALOW.



STA 215+69.00, LT.
 INSTALL FLASHING LIGHT WARNING DEVICE WITH GATE, (BY UPRR)

INSTALL TRAFFIC SIGNAL POLE AND MAST ARM (BY I-70 DEVELOPER), SEE NOTE 1

INSTALL TRAFFIC PRE-SIGNAL HEAD ON MAST ARM, (BY I-70 DEVELOPER)

REMOVE EXISTING FLASHING LIGHT WARNING DEVICE AND GATE, (BY UPRR)

SEE DETAIL A

STA 216+34.00, LT.
 INSTALL FLASHING LIGHT WARNING DEVICE, (BY UPRR)

STA 215+34.00, LT.
 INSTALL FLASHING LIGHT WARNING DEVICE, (BY UPRR)

EXISTING CONCRETE TRACK PANELS, INSTALLED AS PART OF 36TH YARD TRACK RECONSTRUCTION

EXISTING CITY OF DENVER SIDEWALK EASEMENT

STA 214+03.00, RT.
 INSTALL FLASHING LIGHT WARNING DEVICE, (BY UPRR)

EXISTING UPRR ROW

PROPOSED CDOT PERMANENT EASEMENT

To Belt Line Conn. & Sand Creek Junct.

REMOVE EXISTING SIGNAL BUNGALOW, (BY UPRR)

STA 213+20.00, RT.
 INSTALL SIGNAL BUNGALOW, (BY UPRR)

INSTALL TRAFFIC SIGNAL POLE AND 2- MAST ARMS (BY I-70 DEVELOPER), SEE NOTE 1

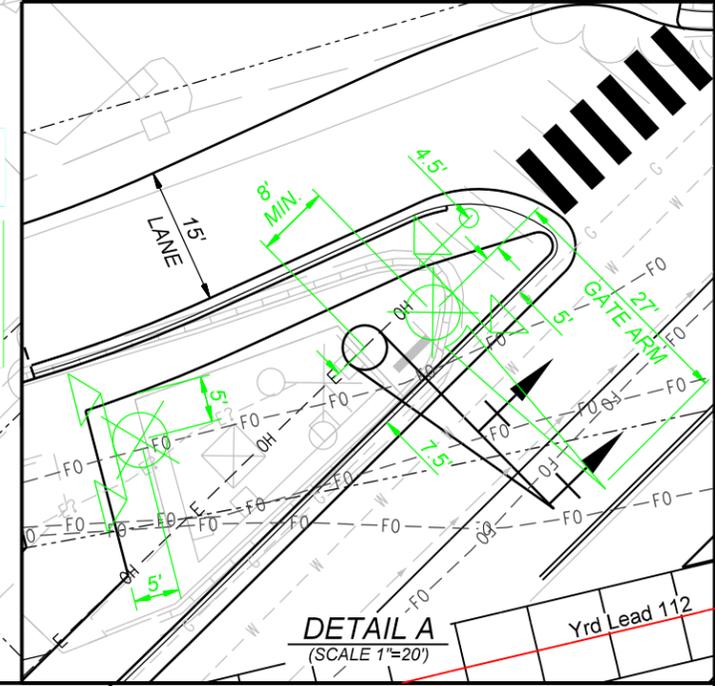
ROADWAY WIDENING AND NEW SIDEWALK, (BY I-70 DEVELOPER)

REMOVE EXISTING FLASHING LIGHT WARNING DEVICE AND GATE, (BY UPRR)

STA 214+86.00, RT.
 INSTALL FLASHING LIGHT WARNING DEVICE WITH GATE. FLASHING LIGHTS TO BE INSTALLED FOR NORTHBOUND AND SOUTHBOUND DIRECTIONS, (BY UPRR)

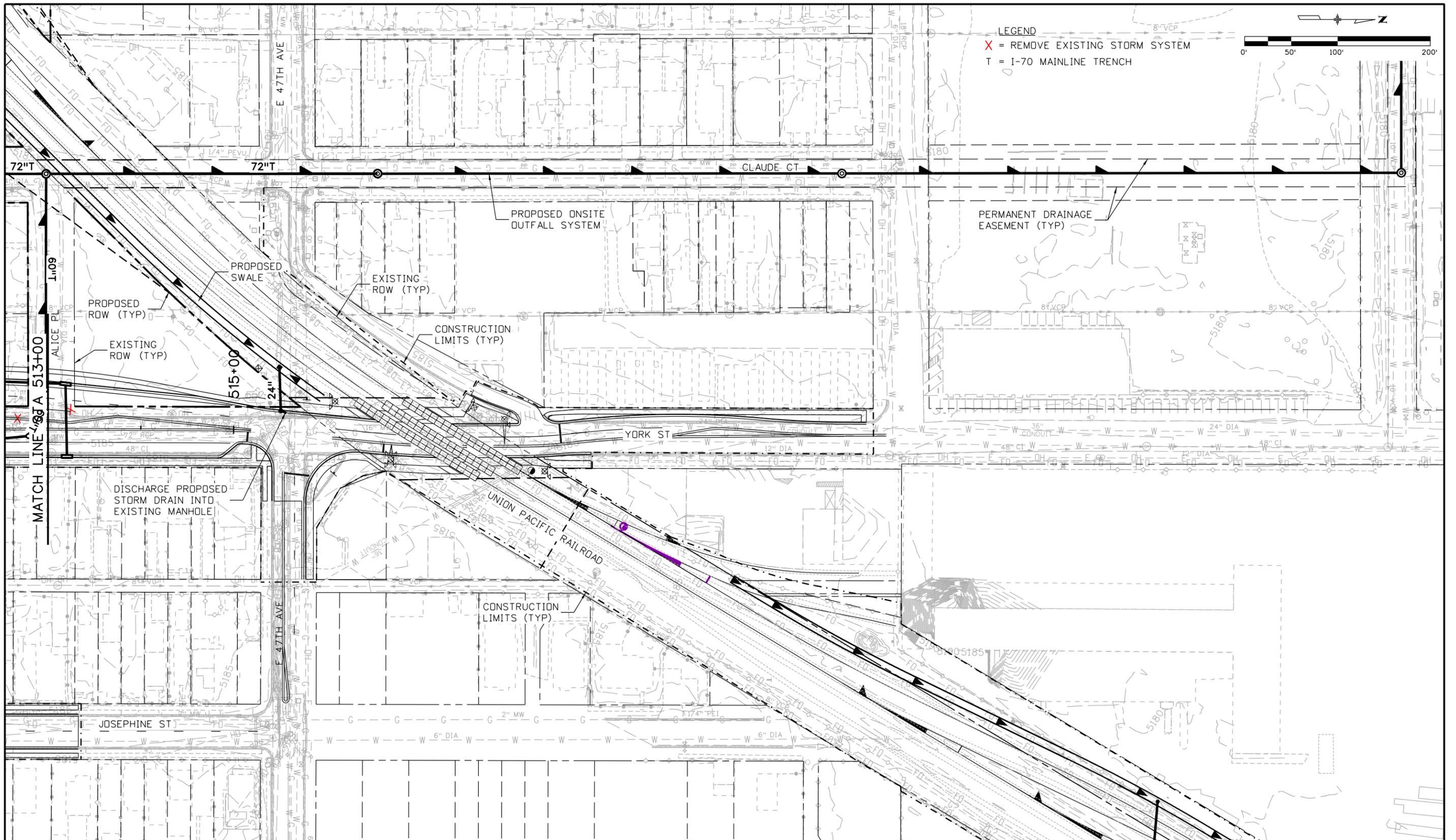
INSTALL TRAFFIC SIGNAL POLE AND MAST ARM, (BY I-70 DEVELOPER)

INSTALL TRAFFIC SIGNAL HEAD ON MAST ARM, (BY I-70 DEVELOPER)

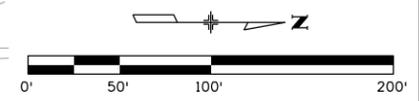


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	CHECKED BY:	JW	
	DATE:	1/6/2016	
	SHEET NUMBER:	R002 of 002	
LOCATION & DESCRIPTION: Denver, Colorado UPRR Tracks At-Grade Crossing with York Street DOT No. 804-422R			SHEET TITLE: EXISTING TRACKS AT YORK STREET AT-GRADE CROSSING IMPROVEMENTS - TRACK PLAN



LEGEND
 X = REMOVE EXISTING STORM SYSTEM
 T = I-70 MAINLINE TRENCH



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Print Date: 6/3/2016		Sheet Revisions		Colorado Department of Transportation		PRELIMINARY		YORK STREET DRAINAGE PLAN STA 513+00 TO 515+43		Project No./Code		
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Horiz. Scale: 1:100 Vert. Scale: As Noted							Revised:				19631	
Unit Information Unit Leader Initials							Void:				Sheet Number	
ATKINS		7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276		KJS		Subset Sheets: 41 of						

Memo

To:	Ron Dickey, CDOT	Date:	June 1, 2016
From:	David Sprague	cc:	Dan Liddle, Atkins
Ref:	I-70 East		
Subject:	Railroad Crossing at 47th Avenue and York Street		

The purpose of this memo is to describe the traffic control devices needed for the Union Pacific (UP) railroad crossing at York Street, just north of East 47th Avenue. Existing crossing conditions are shown in Figure 1.



Figure 1. Existing Union Pacific railroad crossing at York Street and 47th Avenue

The I-70 East project will include the addition of a traffic signal at the 47th Avenue/York Street intersection and improvements to roadway geometries at this crossing, including adding a southbound left-turn lane, adding a northbound lane on York Street south of 47th Avenue, removing the channelized westbound right turn at 47th Avenue, and adding a second westbound lane on 47th Avenue. These improvements are shown in **Appendix A**. Discussions follow regarding the application of traffic control devices consistent with the *Manual on Uniform Traffic Control Devices* (MUTCD, 2009), pre-emption and pre-signals at the railroad crossing, and impacts to adjacent intersections.

It should be noted that a field diagnostic meeting was held on site with representatives from CDOT, the UPRR, and Denver on May 12, 2016. During this meeting design features and signal timing parameters were discussed and agreed upon, which are reflected in this memorandum.

Traffic Control Consideration

The recommended traffic control devices for this crossing are shown in the design layout found in **Appendix A**. The northbound and southbound approaches to the UP railroad crossing will have automatic gates in conjunction with flashing light signals. The automatic gate and flashers for the northbound approach will be located approximately 90 feet downstream of 47th Avenue (measured from the edge of pavement of 47th Avenue). A single gate will span the northbound single-lane approach sufficiently and this approach only requires use of a single flashing light signal. The southbound approach will have a gate and flashing light

signals located approximately 45 feet upstream of the railroad crossing (measured from the railroad crossing along the right curb line of the southbound lanes). A single gate will span the southbound two-lane approach sufficiently. Both gates and flashers will be equipped per MUTCD standards (8C.02 and 8C.04), including the standard cross buck sign (R15-1) and a supplement number of tracks plaque (R15-2P) because there are three crossing tracks.

Because the southbound approach is two lanes, flashers are required on both sides of the roadway. However, York Street will not have a median on which to place flashers for the left side of the southbound approach. For this analysis, a couple of different options were considered for the placement of a second flashing signal on the southbound approach. First, overhead mast-mounted flashing signals were considered. However, the need for a pre-signal (to be discussed later in this memo) for the southbound approach would result in the pre-signal heads and the overhead flashing signals being located in very close proximity to each other and at approximately the same height. This may result in confusion with mixed signal messages. A second option was to place a north-facing flashing signal on the back side of the northbound flashing signal south of the tracks. This would result in placement of a second flashing signal for the southbound approach on the left side of the roadway, but on the south side or far side of the crossing tracks. However, the use of a pre-signal, a gate with flashing lights, and application of other MUTCD signing for the crossing is considered to be sufficient to provide the necessary warning for southbound approaching traffic.

The proposed improvements to the crossing include improvements to the sidewalk along the west side of York Street and the addition of a sidewalk along the east side of York Street. In an effort to provide additional warning to pedestrians that are anticipated to be using the sidewalks additional flasher assemblies are proposed at this crossing. A south-facing flashing signal is recommended to be placed on the west side of York Street, south of the crossing. This southbound flashing signal will provide additional warning for both northbound vehicles on York Street and pedestrians using the sidewalk along the west side of York Street. Similarly, the design is recommended the placement of a north-facing flasher signal along the east side of York Street, just north of the crossing. This northbound flashing signal will provide additional warning for both southbound vehicles on York Street and pedestrians using the sidewalk on the east side of York Street.

In addition, there is a large volume of pedestrians currently observed to use the sidewalk that exists on York Lane. The pedestrians that travel northeast on York Lane can turn south on York Street and proceed across the crossing. This movement can be made without the benefit of visual reference to the proposed flasher signals. In order to provide these pedestrians with warning of crossing movement, the improvements propose to install a flasher signal just north of the crossing that will face southwest on York Lane. This flasher signal will provide additional warning to the pedestrians and could also provide warning to any vehicles that travel the wrong way on York Lane (currently a one-way road allowing southwest travel away from York Street).

Per the MUTCD, identical pavement markings, including an "X" and the letters "RR," will be placed on the northbound and southbound pavement approaches to the grade crossing. The grade-crossing pavement marking symbols (see Figure 8B-7 of the MUTCD) will be approximately 200 feet upstream from the gate for the southbound approach (south of 47th Avenue). The grade-crossing pavement marking symbols will be located approximately 100 feet upstream of the gate on the northbound approach. A stop line will be placed upstream of the gate for the northbound approach, and approximately 40 feet upstream of the gate for the southbound traffic. Because the stop line for the southbound approach is 230 feet upstream of the signal at 47th Avenue and York Street, a pre-signal is required to meet sight distance requirements, per the MUTCD.

The York Lane access and the placement of the automatic gate for southbound traffic on York Street results in insufficient space, under existing conditions, to put the pre-signal pole south of York Lane. However, some minor modification to the curbing and York Lane access width results in the ability to place the pre-signal pole in the southwest corner of the York Lane/York Street intersection (as shown in **Appendix A**). Placement of the pre-signal at this location will minimize the distance between the pre-signal stop bar and the intersection or York Street/47th Avenue. The traffic signal pole will be located directly north of the flashing signal pole location for the automatic gate.

Signal Impacts and Timing Consideration

The signal at 47th Avenue and York Street will require pre-emption for the railroad crossing. The signal at York Street and 46th Avenue (south of the railroad crossing) is sufficiently spaced to avoid impacts due to the railroad crossing north of 47th Avenue. Specific pre-emption needs were determined using a worksheet developed by the Texas Department of Transportation based on industry standards. Pre-emption time needs

to be coordinated with Union Pacific. Based on the preliminary design, 64 seconds is needed for this crossing, with 37 seconds provided by the railroad and an additional 27 seconds of warning time required from the railroad. For details on the pre-emption analysis performed, see **Appendix B**.

Additionally, the preliminary design has developed a phasing scheme. For a detailed phase diagram, see **Appendix C**. The signal at 47th Avenue will have six phases, including phases for the southbound pre-signal, northbound through, southbound through, southbound left-turn, and separate phases for westbound right-turn and westbound left-turn movements. When a train is detected, the pre-signal will turn red, stopping all southbound traffic; additionally, northbound and westbound traffic at 47th Avenue will be stopped, including the application of a westbound no-right-turn blank-out sign. The southbound through and left-turn vehicles will be provided enough green time at 47th Avenue to clear the railroad crossing while all other movements are stopped.

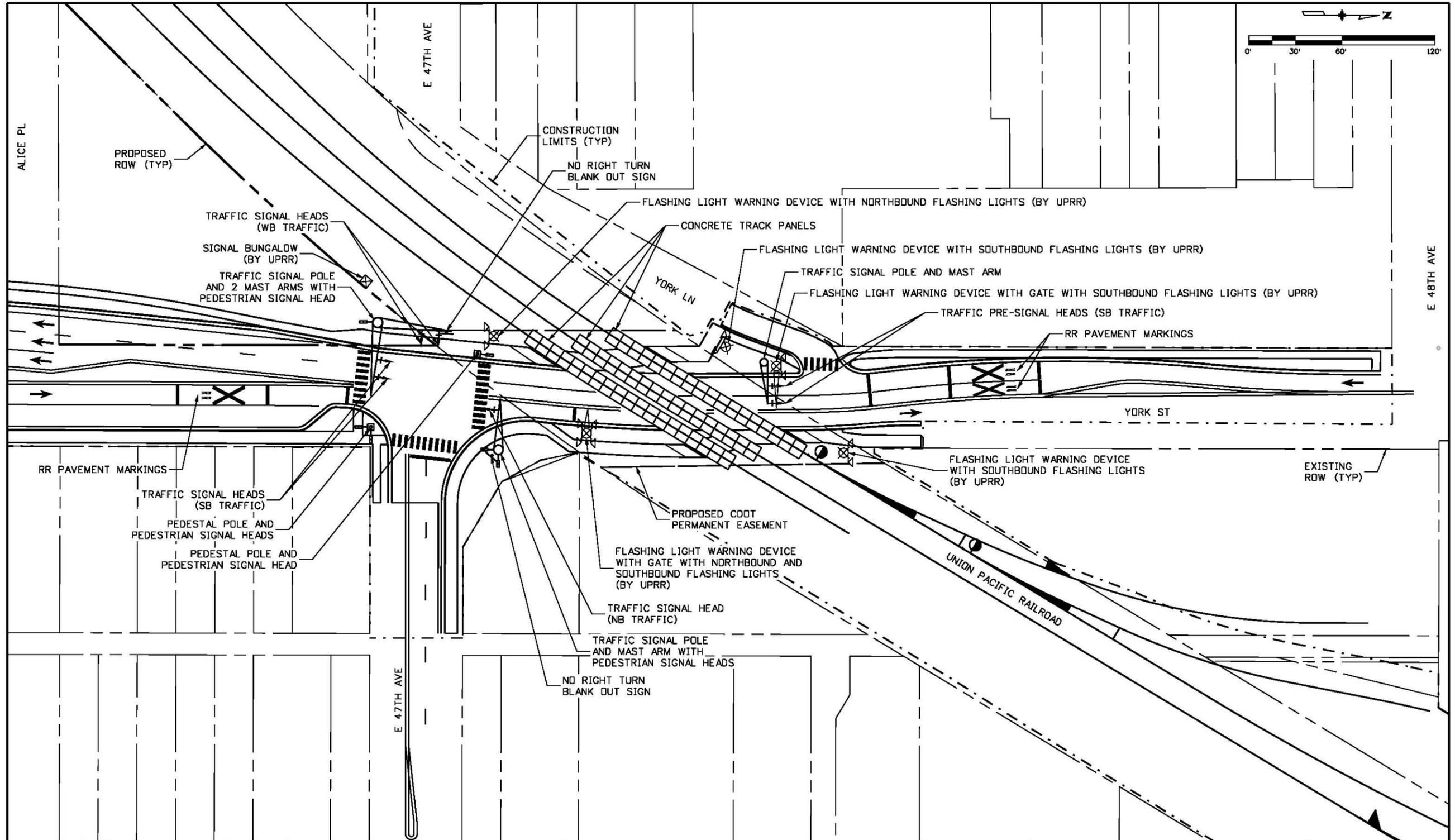
While the train is crossing, pedestrian eastbound and westbound crossing phases will be allowed with westbound permitted left turns. A “no right turn on red” for westbound right turns will be maintained, and then north and south pedestrian phases will be allowed, also maintaining the “no right turn on red” for the westbound right turn. After the train tracks clear, the signal will return to its normal operating mode with northbound and southbound movements being the likely first phase to be served.

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Appendix A.

Design Layout

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Print Date: 6/1/2016
 File Name: York St Crossing Exhibit 01.dgn
 Horiz. Scale: 1:60 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

ATKINS
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Sheet Revisions		
Date:	Comments	Init.

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 2000 South Holly Street
 Denver, CO 80222
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Region 1 **KJS**

PRELIMINARY
 No Revisions:
 Revised:
 Void:

UPRR TRACKS CROSSING AT YORK STREET (E 46TH AVE TO E 48TH AVE)

Designer:	Structure Numbers
Detailer:	
Sheet Subset:PUC-Apprvl	Subset Sheets: 1 of 2

Project No./Code
 FBR 0704-234
 19631
Sheet Number

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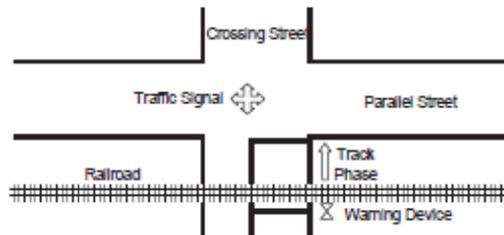
Appendix B.

Pre-emption Analysis



GUIDE FOR DETERMINING TIME REQUIREMENTS FOR TRAFFIC SIGNAL PREEMPTION AT HIGHWAY RAIL GRADE CROSSINGS

City Denver Date 02/09/15
 County Denver Completed by Atkins
 District _____ District Approval _____



Parallel Street Name
E 47th Avenue
 Crossing Street Name
York Street

Railroad Union Pacific Railroad Contact _____
 Crossing DOT# _____ Phone _____

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

- | | | |
|--|----|-----|
| 1. Preempt delay time (seconds) | 1. | 0.0 |
| 2. Controller response time to preempt (seconds) | 2. | 0.0 |
| 3. Preempt verification and response time (seconds): add lines 1 and 2 | 3. | 0.0 |

Remarks

 Controller type: ASC-3

Worst-case conflicting vehicle time

- | | | |
|---|----|------|
| 4. Worst-case conflicting vehicle phase number | 4. | 2 |
| 5. Minimum green time during right-of-way transfer (seconds) | 5. | 5.00 |
| 6. Other green time during right-of-way transfer (seconds) | 6. | 0.00 |
| 7. Yellow change time (seconds) | 7. | 3.00 |
| 8. Red clearance time (seconds) | 8. | 2.00 |
| 9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8 | 9. | 10.0 |

Remarks
assumed value
assumed value
assumed value
assumed value

Worst-case conflicting pedestrian time

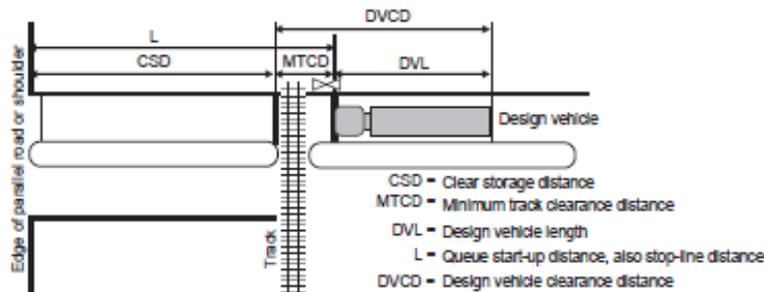
- | | | |
|---|-----|------|
| 10. Worst-case conflicting pedestrian phase number | 10. | 8 |
| 11. Minimum walk time during right-of-way transfer (seconds) | 11. | 5.0 |
| 12. Pedestrian clearance time during right-of-way transfer (seconds) | 12. | 10.0 |
| 13. Vehicle yellow change time, if not included on line 12 (seconds) | 13. | 3.0 |
| 14. Vehicle red clearance time, if not included on line 12 (seconds) | 14. | 2.0 |
| 15. Worst-case conflicting pedestrian time (seconds): add lines 11 through 14 | 15. | 20.0 |

Remarks
CCD approved time
CCD requested time
not in line 11
not in line 11

Worst-case conflicting vehicle or pedestrian time

- | | | |
|--|-----|------|
| 16. Worst-case conflicting vehicle or pedestrian time (seconds): maximum of lines 9 and 15 | 16. | 20.0 |
| 17. Right-of-way transfer time (seconds): add lines 3 and 16 | 17. | 20.0 |

SECTION 2: QUEUE CLEARANCE TIME CALCULATION



		Remarks
18.	Clear storage distance (CSD, feet)18.	75 SB shoulder to edge of 47th Ave
19.	Minimum track clearance distance (MTCD, feet)19.	203
20.	Design vehicle length (DVL, feet)20.	75 Design vehicle type: tractor-trailer
21.	Queue start-up distance, L (feet): add lines 18 and 19 21.	278
22.	Time required for design vehicle to start moving (seconds): calculate as $2+(L+20)$22.	15.9
23.	Design vehicle clearance distance, DVCD (feet): add lines 19 and 2023.	278
24.	Time for design vehicle to accelerate through the DVCD (seconds) 24.	23.3 Read from Figure 2 in Instructions.
25.	Queue clearance time (seconds): add lines 22 and 24 25.	39.2

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

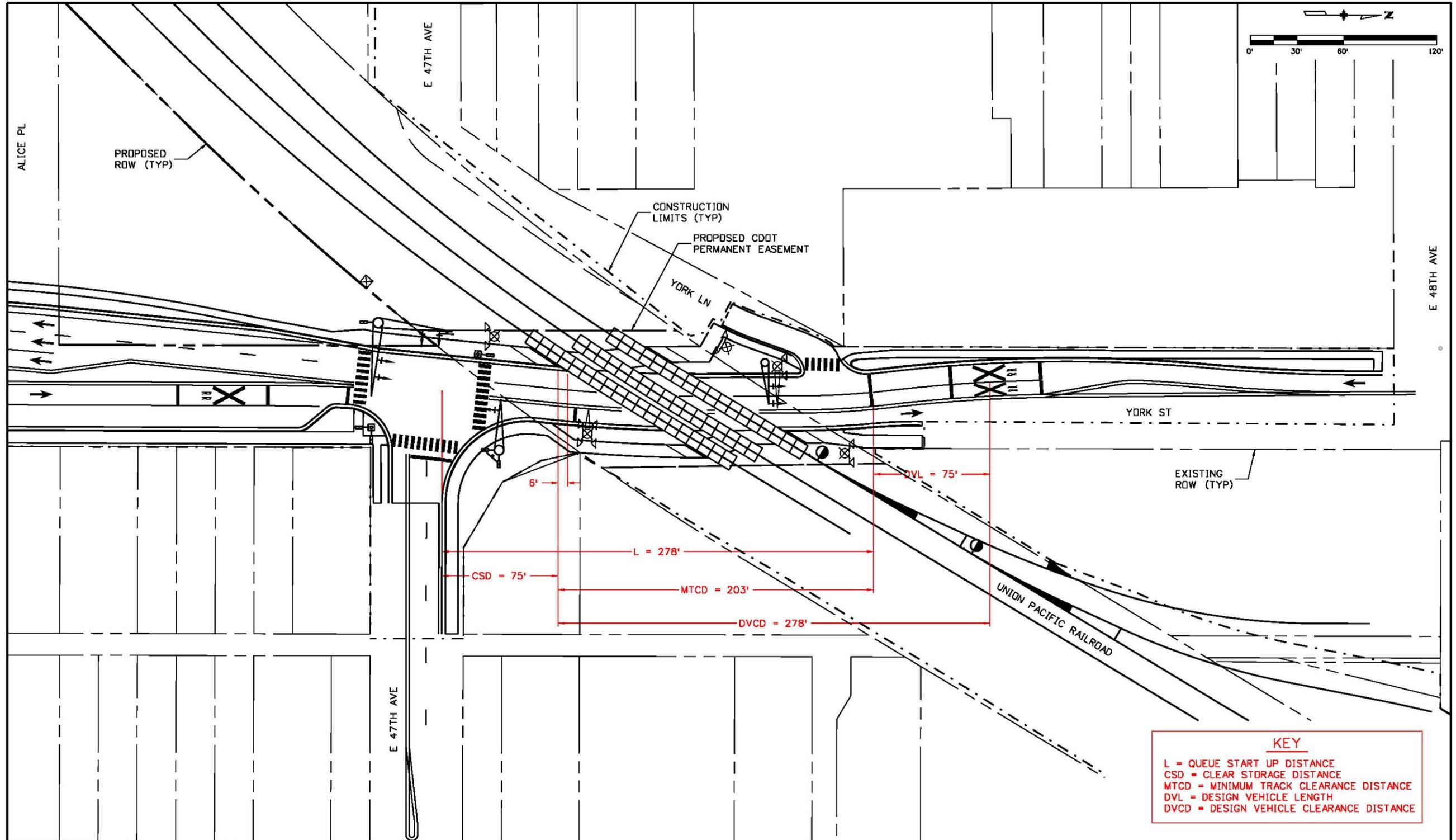
		Remarks
26.	Right-of-way transfer time (seconds): line 17 26.	20.0
27.	Queue clearance time (seconds): line 25 27.	39.2
28.	Desired minimum separation time (seconds) 28.	4.0 minimum of 4 s
29.	Maximum preemption time (seconds): add lines 26 through 28 29.	63.2

SECTION 4: SUFFICIENT WARNING TIME CHECK

		Remarks
30.	Required minimum time, MT (seconds): per regulations30.	20.0
31.	Clearance time, CT (seconds): get from railroad31.	17.0 $(MTCD-35)/10$
32.	Minimum warning time, MWT (seconds): add lines32.	37.0 Excludes buffer time (BT)
33.	Advance preemption time, APT, if provided (seconds): get from railroad 33.	0.0
34.	Warning time provided by the railroad (seconds): add lines 32 and 3334.	37.0
35.	Additional warning time required from railroad (seconds): subtract line 34 from line 29, round up to nearest full second, enter 0 if less than 0 35.	27

If the additional warning time required (line 35) is greater than zero, additional warning time has to be requested from the railroad. Alternatively, the maximum preemption time (line 29) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 1, 5, 6, 7, 8, 11, 12, 13 and 14.

Remarks: _____



KEY
 L = QUEUE START UP DISTANCE
 CSD = CLEAR STORAGE DISTANCE
 MTCD = MINIMUM TRACK CLEARANCE DISTANCE
 DVL = DESIGN VEHICLE LENGTH
 DVCD = DESIGN VEHICLE CLEARANCE DISTANCE

Print Date: 6/1/2016
 File Name: York St Crossing Exhibit 02.dgn
 Horiz. Scale: 1:60 Vert. Scale: As Noted
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Sheet Revisions		
Date:	Comments	Init.

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Region 1 **KJS**

PRELIMINARY
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 Void:

UPRR TRACKS CROSSING AT YORK STREET (TRAFFIC SIGNAL PREEMPTION)
 Designer:
 Detailer:
 Sheet Subset: PUC-Apprvl
 Structure Numbers:
 Subset Sheets: 2 of 2

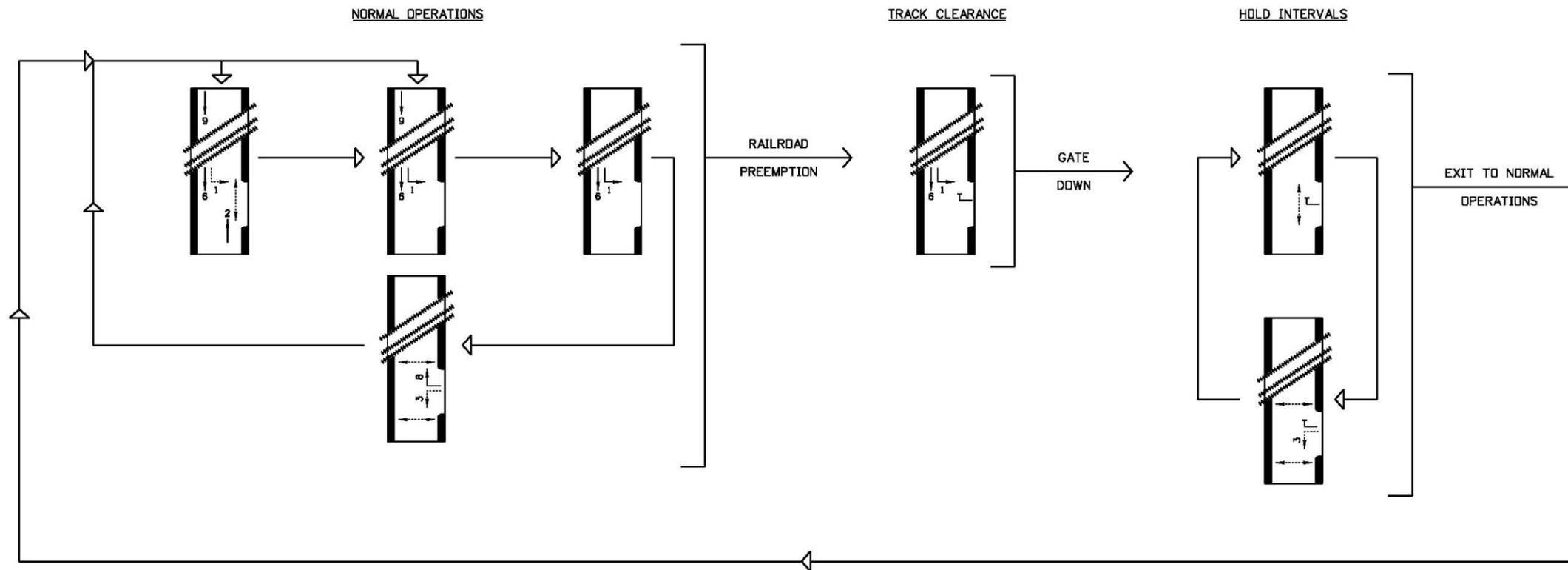
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 19631
 Sheet Number

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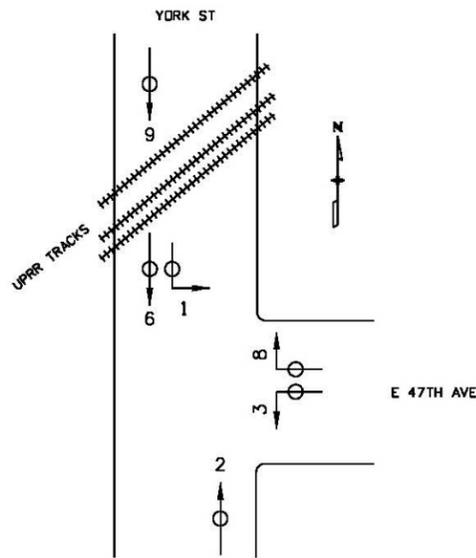
Appendix C.

Phase Diagram

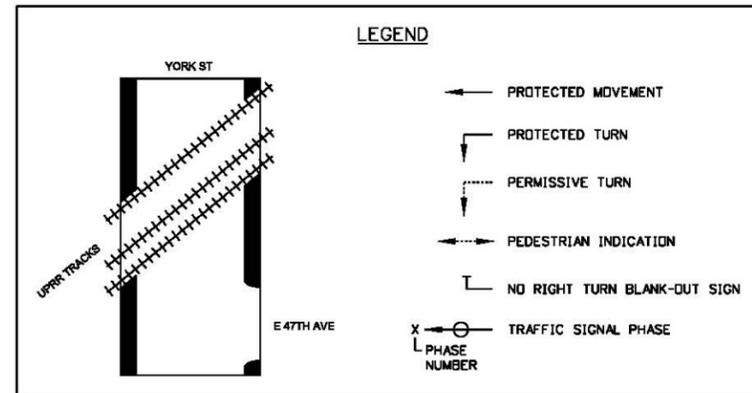
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PHASE DIAGRAM



MAP SCHEMATIC



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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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 Region 1 KJS

PRELIMINARY
 No Revisions:
 Revised:
 Void:

**UPRR TRACK CROSSING OF
 YORK ST AT 47TH AVE
 PHASE DIAGRAM**
 Designer:
 Detailer:
 Sheet Subset: PhaseDiag Subset Sheets: 1 of 1

Project No./Code
 FBR 0704-234
 19631
 Sheet Number

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Highway Rail Grade Crossing Traffic Signal Preemption Request Form

The purpose of this form is to document the preemption operation and timing parameters being requested by the public agency responsible for the traffic signal and convey the information to Union Pacific Railroad. A report was provided to the public agency on behalf of Union Pacific. This report included recommendations to the public agency for consideration to enhance the preemption operation system. Union Pacific Railroad recognizes that the public agency is the final authority regarding the design and operation of the preemption system in accordance with the 2012 (MUTCD) Chapter 8C, Section 8C.09.

Please provide the following information in order to process your request :

Date of Request: June 1, 2016 Public Agency: Colorado Department of Transportation
Requested by (Name/Title): Ronnie Dickey, Central 70 Project, Railroad Manager
Phone: 303-512-5912 Email: ronnie.dickey@state.co.us

Grade Crossing Information:

State: Colorado DOT #: 804422R
District: Central Region RR Subdivision: Wyoming Division
City: Denver Mile Post: 0002.98
County: Denver

Crossing Street Name: York Street
Parallel Street Name: 47th Avenue/York Lane

1) Is this request for Simultaneous Preemption Operation? Yes If "Yes" what is the requested
 No Additional Warning Time? _____ Sec

2) Is this request for Advanced Preemption Operation? Yes If "Yes" what is the requested
 No Additional Warning Time? 27 Sec

3) Indicate below which circuits are being requested:
a. Advanced Preemption Yes No
b. Simultaneous Circuit (XR) Yes No
c. Gates Down Circuit Yes No
d. Supervised Circuit Yes No
e. Traffic Signal Health Circuit Yes No

Comments / Additional Info:

If you have additional or enhanced preemption operation/interconnect requirements, please submit a detailed description below. A circuit drawing or additional information should be provided to assist designers in accommodating your needs.

See attached memo and plans.

Please sign, scan this page, and submit electronically along with support documentation to appropriate Manager of Industry and Public Projects.

Ronnie Dickey
Signature of public agency representative

6-7-2016
Date

Ronnie Dickey
Print or Type Name of public agency representative