



Preliminary Drainage Design Report

Dallas CBD Second Light Rail Alignment (D2)

Draft (20% Submittal)

Dallas, Texas

March 6, 2020



This Report was Prepared for DART
General Planning Consultant Six Managed by HDR



Document Revision Record

Preliminary Drainage Design Report	HDR Report Number: Click here to enter text.
Project Manager: James Frye	PIC: Tom Shelton

Revision Number: 0	Date: March 8, 2019
<i>Version 1</i>	<i>Date: March 6, 2020</i>
<i>Version 2</i>	<i>Date: Click here to enter text.</i>

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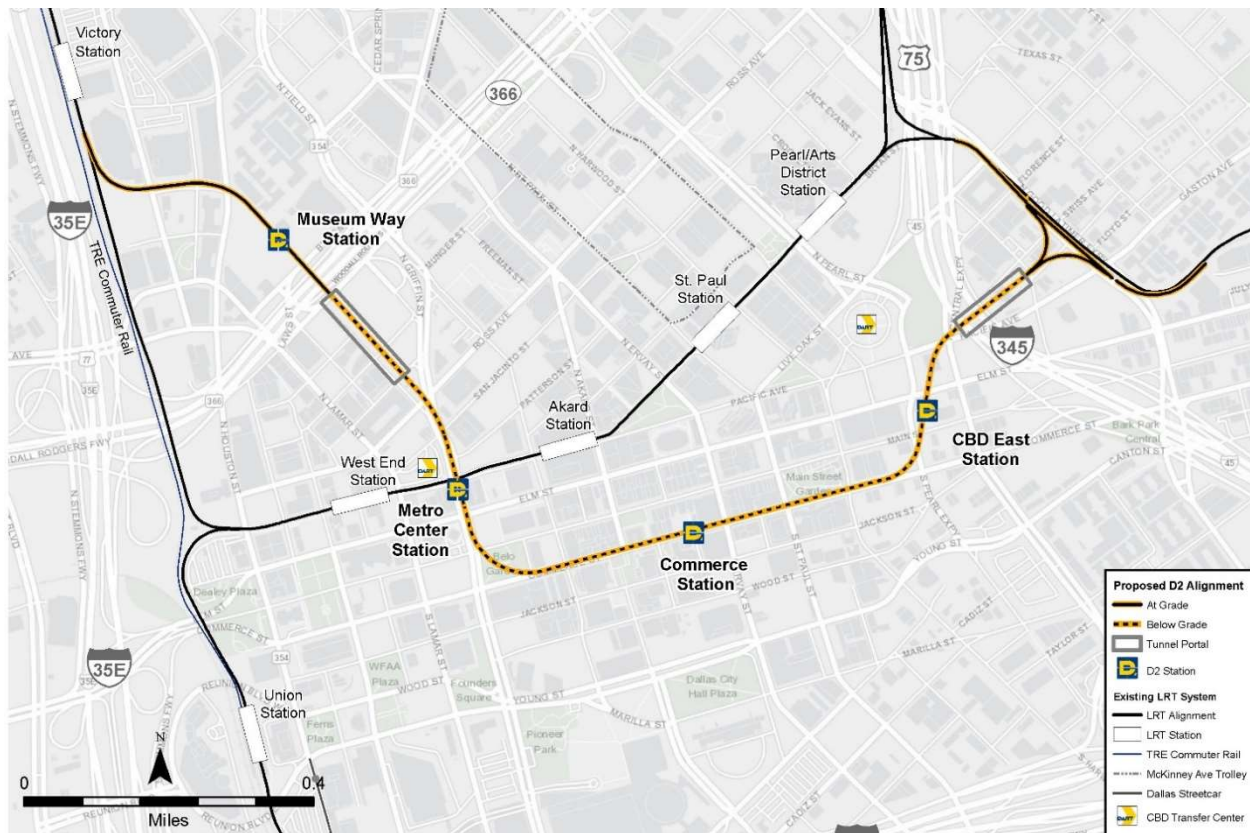
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1 INTRODUCTION

Dallas Area Rapid Transit (DART) is advancing the design of the Dallas Central Business District (CBD) Second Light Rail Alignment (D2). D2 will establish an additional light rail transit (LRT) line through downtown Dallas to increase core capacity and operational flexibility of the DART system.

The D2 alignment begins south of Victory Station. It then proceeds within DART ROW in the center of Museum Way. The alignment crosses under Woodall Rodgers then begins its transition to below grade. It remains underground under Griffin Street and Commerce Street then transitions back to at-grade after the intersection of Pacific Avenue and Cesar Chavez Boulevard. It remains at-grade roughly parallel and south of Swiss Avenue. It then ties to the existing Green Line in the median of Good-Latimer. See Figure 1-1 for a map of the D2 alignment.

FIGURE 1-1. DART D2 Project Location Plan



2 OVERVIEW

The proposed improvements will be overlaid on drainage areas and conceptual drainage designs will be developed for the proposed guideway, tunnel pump station locations, street improvements and station sites. Refer to Technical Memorandum #14 – Tunnel Drainage for information regarding collecting drainage in the tunnel.

This preliminary engineering drainage report includes information about the existing delineated drainage areas and flow pattern.

With the use of collected drainage data described above, drainage area maps will be developed that define drainage divide boundaries for the corridor. Relationships to adjacent land use will be coordinated with local governments and watershed runoff calculated for each sub-basin.

There will be 5 proposed stations that run along the General Planning Consultant Six (GPC6) D2 Subway alignment. They include:

- Museum Way Station
- Metro Center Station
- Commerce Station
- CBD East Station
- Live Oak Station

Museum Way Station and Live Oak Station are the only two at grade stations and subsequently are the two stations that will be included in the surface drainage analysis.

3 RESEARCH AND ASSUMPTIONS

The GPC6 has collected necessary drainage data from existing as-built plans, technical reports, studies, and private development record plans on existing storm sewer system which can be provide upon request. More specifically, data collection consists of:

- Collected drainage area maps from City of Dallas identifying the watershed that includes the project alignment.
- Collected the storm drainage system from City of Dallas serving the watershed and identify those within the corridor right-of-way.
- Conducted field surveys to review the location, size and flow line of existing drainage systems, and tied their locations to nearby control survey points.
- Existing inlet locations were field verified through site visits, survey, existing as-builts, and Google Earth.



- A table has been created which list all the as-builts obtained from the City of Dallas. See Appendix A: Existing City of Dallas Drainage As Built Matrix.

4 PRELIMINARY DESIGN ANALYSIS

Preliminary drainage design is based off the City of Dallas Public Works Department. The Public Works Department requires the 1993 City of Dallas Drainage Design Manual for projects that began design before October 1 , 2019. The following criteria was used for the 20% Drainage Design:

- All drainage areas are calculated for the 100 – Year frequency storm, per Section II: 2. Methods of Determining Design Discharge of the 1993 City of Dallas Drainage Manual.
- Intensities were obtained from the Table: Rainfall Intensity Chart, page 2 of the 1993 City of Dallas Drainage Manual Appendix.
- Runoff Coefficients are from the Table: Runoff Coefficients and Maximum Inlet Times, page 1 of the 1993 City of Dallas Drainage Manual Appendix.
- A Time of Concentration (Tc) for the minor drainage areas of 10 minutes was used for the 20% submittal.

5 DRAINAGE AT SPECIFIC LOCATIONS

5.1 Overview

Surface drainage is currently collected via existing drainage structures along the corridor. These existing structures connect to many existing drainage systems throughout this downtown area, which are all connected to a larger system that outfalls into the Trinity River. At Woodall Rogers there is an existing 12-foot horseshoe culvert that runs underneath the road and outfalls at the Trinity River. McKinney Avenue has an existing 10 ft by 10 ft box culvert that outfalls at the Trinity River as well. Along Commerce Avenue there is an existing seven-foot horseshoe culvert system. This system continues to the Pearl St. intersection and runs north under Pearl St until Pacific Ave. Then it turns east and runs underneath Pacific Ave until it is east of Interstate 30. This system is known at the Town Branch Storm Sewer system and eventually also outfalls into the Trinity River.

5.2 Sub basin Drainage Areas

With the use of collected drainage data described above, drainage area maps will be developed that define drainage divide boundaries for the corridor. Relationships to adjacent



land use will be coordinated with local governments and watershed runoff calculated for each sub-basin. The grouping below is used to create sub basins for each section of the corridor based on existing drainage flow patterns. Groups may change after 30% design based upon further investigation and additional underground utility information.

TABLE 5-1. SUB BASIN DRAINAGE AREA LIMITS

Sub basin ID	Begin Station	Location	End Station	Location
GROUP A	CBD-2 EB STA 10+00	Beginning of Project	CBD-2 EB STA 34+85	Woodall Rogers
GROUP B	CBD-2 EB STA 34+85	Woodall Rogers	CBD-2 EB STA 51+60	Pacific Ave.
GROUP C	CBD-2 EB STA 51+60	Pacific Ave.	CBD-2 EB STA 93+80	Main St.
GROUP D	CBD-2 EB STA 93+80	Main St.	CBD-2 EB STA 100+55	Pacific Ave.
GROUP E	CBD-2 EB STA 100+55	Pacific Ave.	SE-1 SB STA 23+80	Live Oak Station
GROUP F	CBD-2 EB STA 113+70	N. Good Latimer	SE-1 SB STA 32+93	End of Project

5.3 Portal and Tunnel Drainage Areas

In the tunnel section there will be minimal drainage and track drains will be utilized and collected at the pump station. The portal sections drainage will be collected using grate inlets and underdrains and collected at the nearest tunnel pump station.

The West Portal U-Wall is from CBD-2 EB Station 35+30 to CBD-2 EB Station 41+50 and the width varies from 37.5 feet to 40.5 feet. The East Portal U-Wall is from CBD-2 EB Station 101+65 to CBD-2 EB Station 107+60 and the width varies from 35.8 feet to 40.5 feet. By establishing the proposed drainage area of the West Portal (Q_{WP}) and the East Portal (Q_{EP}) we can provide the flow data need to provide preliminary design of a sump pump system design at the underground station.

- Q_{WP} = 4.64 CFS
- Q_{EP} = 4.64 CFS

Refer to Technical Memorandum #14 – Tunnel Drainage for more detailed information on collecting drainage in the tunnel.



5.4 Station Drainage

Museum Way Station and Live Oak Station are the only at grade stations in the alignment. The surface drainage at these stations will be collected by track drains, grate inlets and/or curb inlets.

6 DRAINAGE ANTICIPATED WORK

6.1 Additional As-Builts

The City of Dallas was helpful in providing as-built data which resulted in older plans. There will need to be additional visits and request to the city to make available the more recent project that have been built in the past five years near project area.

6.2 Additional Survey

The survey used for the preliminary design was useful but did not include all the areas that are captured within the GPC6. Additional survey, especial at the beginning and end of the project along with any TXDOT data involving Klyde Warren Park will be needed to support the proposed design.

6.3 Drainage Design

Time of Concentration (T_c) for the minor drainage areas of 10 minutes was used for the preliminary submittal. In the next phase of evaluation (T_c) may have higher times based on the evaluation of the existing drainage system and should be quantified using the Rational Formula from the 1993 City of Dallas Drainage Design Manual.

Based on our investigations, we established the existing Q 's flowing into the two (2) - Portals that connect to the tunnel. While this information can be utilized to assist in the sump pump design, it is equally imperative that proposed flows (Q 's) be identified in the next phase.

Museum Way Station will need additional survey to determine if there are any existing inlets and trunk lines in the parking lot where the Station will be located.

Live Oak Station is located in the center of Good Latimer Expy. It is anticipated that the surface drainage will be collected by the existing track drains, grate inlets and curb inlets on Good Latimer Expy.



7 CONCLUSIONS

This report presents the 20% drainage design of the DART D2 LPT project. The drainage design at this level includes delineation of existing drainage areas along the alignment and resulting 100-year design runoff. Existing inlet capacities along the alignment are not included.

This report does not include drainage design in the tunnel. Please refer to Technical Memorandum #14 – Tunnel Drainage for additional information.



Appendix A. Existing City of Dallas Drainage As-Built Matrix

Filename	City of Dallas ID	Description	Print Type	Within LPA D2
421-106_1-2.tif	421-106	Preston St and Live Oak St Lateral. Ties to Pearl St relief sewer	Plan and Profile	Yes
421-106_2-2.tif	421-106	Pearl St. relief sewer profile view. Trunkline is west of Pearl street	scroll plot	Yes
421-108_1-3.tif	421-108	Storm Sewer for Boll St(Now Swiss Ave): Flora to Dallas Branch	Plan and Profile	Yes
421-108_2-3.tif	421-108	Storm Sewer for Boll St(Now Swiss Ave): Flora to Dallas Branch	Plan and Profile	Yes
421-108_3-3.tif	421-108	Storm Sewer for Boll St(Now Swiss Ave): Flora Boll St Intersection	Plan	Yes
421-228_1-4.tif	421-228	Storm Sewer: Pacific Ave from Trinity River to Olive St	Scroll Profile	Yes
421-228_2-4.tif	421-228	Pacific Ave Storm Sewer Layout of Reverse Curve	Plan	Yes
421-228_3-4.tif	421-228	Storm Sewer: Pacific Ave (as constructed, 2-17-1930)	Scroll Profile	Yes
421-228_4-4.tif	421-228	Storm Sewer: Pacific Ave from Trinity River to Olive St	Scroll Plan	Yes
421-229_1_3.tif	421-229	Storm Sewer: Bryan St. Pacific Ave to Ervay.	Scroll Plan	No
421-229_2_3A.tif	421-229	Storm Sewer: Bryan St: Harwood to Olive St.	Scroll Plan	No
421-229_2_3B.tif	421-229	Storm Sewer: Bryan St.: St. Paul to Harwood	Scroll Plan	No
421-229_3_3.tif	421-229	Storm Sewer: Bryan St.: Harwood to Olive St.	Scroll Plan	No
421-229_Ervay_Bryan to Federal.tif	421-229	Storm Sewer: Ervay: Bryan to Federal	Plan	No
421-229_Profile.tif	421-229	Storm Sewer: Bryan St.: Pacific Ave to Olive St	Scroll Profile	No
421-250_1_2.tif	421-250	Storm Sewer: Henry St: Willams St to Alley south of Williams St.	Plan	No
421-250_2_2.tif	421-250	Storm Sewer: Henry St: Willams St to Alley south of Williams St.	Profile	No
421-26.tif	421-26	Griffin: Ross to Hord	Plan View	Yes
421-26_1_1.tif	421-26	Canton: Harwood Intersection to 7 foot brick storm sewer	Plan View	Yes
421-364.tif	421-364	Storm Sewer: Dallas Branch	Scroll Plan	Yes
421-45.tif	421-45	18" RCP under sidewalk on South Side of Broom: From Wesley Alley to Field Street.	Scroll Profile	No
421-70.tif	421-70	Live Oak: Pearl Street to Cantegral	Scroll Plan	Yes
421-73.pdf	421-73	Main St: Market to Akard St.	Scroll Plan	Yes
421-78.pdf	421-78	McKinney Ave: Alamo to St Paul	Scroll Plan	No
421-89_1-2.tif	421-89	Town Branch: 72" RCP along Main from Erway to Field, Sth to	Plan View	Yes
421-89_2-2.tif	421-89	Town Branch: 72" RCP along Main from Erway to Field, Sth to	Profiles	Yes
421-93_1-4.tif	421-93	Swiss Ave: Peak to Fluoride	Plan View	No
421-93_2-4.tif	421-93	Swiss Ave: Oak to Liberty	Plan View	No
421-93_3-4.tif	421-93	Swiss Ave: Good Latimer to Cantegral	Plan View	Yes
421-93_4-4.tif	421-93	Swiss Ave: Hawkins to Peak St.	Profiles	Yes
421B-26_1-1.tif	421B-26	Storm Sewer: Town Branch from Young St to Wood St.	Plan	No
421Q-10_1-1.tif	421Q-10	Storm Sewer: Olin Welborn from RR to Caroline St.	Plan and Profile	No
421Q-106_1.tif	421Q-106	Storm Sewer: Field St from Broom to McKinney Ave.	Plan and Profile	No
421Q-109_1.tif	421Q-109	Storm Sewer: Crowdus st from Elm to Indiana Ave	Plan and Profile	No
421Q-1782_10-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 3/11	Plan and Profile	Yes
421Q-1782_11-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 4/11	Plan and Profile	Yes
421Q-1782_12-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 5/11	Plan and Profile	Yes
421Q-1782_13-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 5A/11 Rev 4	Plan and Profile	Yes
421Q-1782_14-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 6/11	Plan and Profile	Yes
421Q-1782_15-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 6A/11 Rev 4	Plan and Profile	Yes
421Q-1782_16-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Profile for 27" RCP) 7/11	Plan and Profile	Yes
421Q-1782_17-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Manhole and Construction Shaft Details) 8/11	Details	Yes
421Q-1782_18-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Transition Structure) 9/11	Details	Yes
421Q-1782_1-97.tif	421Q-1782	Woodall Rodgers Outfall at Field St (Cover Sheet, Year 1974) 1/6	Cover Sheet	Yes
421Q-1782_19-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Type C Manhole Detail) 10/11	Details	Yes
421Q-1782_20-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Type C Manhole Detail) 10A/11 Rev 1	Details	Yes
421Q-1782_21-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 10B/11 Rev 2	Plan and Profile	Yes

Filename	City of Dallas ID	Description	Print Type	Within LPA D2
421Q-1782_22-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Details of Junction Box at Sta 14+69.29) 10C/11 Rev 1 & 4	Details	Yes
421Q-1782_23-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 10D/11 Rev 4	Plan and Profile	Yes
421Q-1782_24-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Construction Shaft Details) 11/11	Details	Yes
421Q-1782_25-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Details of Sluice Gate Tower) 11A/11	Details	Yes
421Q-1782_26-97.tif	421Q-1782	Woodall Rodgers Outfall From Trinity River to 400' East of Industrial Blvd (Cover Sheet) 1/15	Cover Sheet	No
421Q-1782_27-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Trinity River 3/15	Plan and Profile	No
421Q-1782_28-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd 4/15 VOID	Plan and Profile	No
421Q-1782_29-97.tif	421Q-1782	Woodall Rodgers Outfall at Field St 12' Horseshoe Tunnel 2/6	Plan and Profile	Yes
421Q-1782_29-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd 4/15	Plan and Profile	No
421Q-1782_30-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd 5/15 VOID	Plan and Profile	No
421Q-1782_31-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd 5/15	Plan and Profile	No
421Q-1782_32-97.tif	421Q-1782	Woodall Rodgers Outfall From Trinity River to 400' East of Industrial Blvd 6/15	Plan and Profile	No
421Q-1782_33-97.tif	421Q-1782	Woodall Rodgers Outfall From Trinity River to 400' East of Industrial Blvd 6/15	Plan and Profile	No
421Q-1782_34-97.tif	421Q-1782	Woodall Rodgers Outfall Cofferdam and Levee Cut 7/15	Plan	No
421Q-1782_35-97.tif	421Q-1782	Woodall Rodgers Outfall Sluice Gate Tower and Foot Bridge 8/15	Plan and Profile	No
421Q-1782_36-97.tif	421Q-1782	Woodall Rodgers Outfall Details of Sluice Gate Tower 9/15	Details	No
421Q-1782_37-97.tif	421Q-1782	Woodall Rodgers Outfall Details of Outfall Structure 10/15	Details	No
421Q-1782_38-97.tif	421Q-1782	Woodall Rodgers Outfall Multiple Box Culvert Detail 11/15	Details	No
421Q-1782_39-97.tif	421Q-1782	Woodall Rodgers Outfall at Field St 12' Horseshoe Tunnel Open Cut Alt no. 1 3/6	Plan and Profile	Yes
421Q-1782_39-97.tif	421Q-1782	Woodall Rodgers Outfall M.B Culvert for Siphon Section 12/15	Details	No
421Q-1782_40-97.tif	421Q-1782	Woodall Rodgers Outfall Transition Structure 13/15	Details	No
421Q-1782_41-97.tif	421Q-1782	Woodall Rodgers Outfall Foot Bridge Details 14/15	Details	No
421Q-1782_42-97.tif	421Q-1782	Woodall Rodgers Outfall Pressure Door and Frame 15B/15	Details	No
421Q-1782_43-97.tif	421Q-1782	Woodall Rodgers Outfall Pressure Door and Frame 15C/15	Details	No
421Q-1782_44-97.tif	421Q-1782	Woodall Rodgers at M.K. & TRR East of C.R.I & P.R.R	Plan and Profile	No
421Q-1782_45-97.tif	421Q-1782	Woodall Rodgers Outfall From Trinity River to 400' East of Industrial Blvd (Cover Sheet) 1/18	Cover Sheet	No
421Q-1782_46-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd: Drainage Area Map 2/18	Plan	No
421Q-1782_47-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Trinity River 3/18	Plan and Profile	No
421Q-1782_48-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Trinity River 4/18	Plan and Profile	No
421Q-1782_49-97.tif	421Q-1782	Woodall Rodgers Outfall at Field St: 72" RCP Equalizer 4/6	Plan and Profile	Yes
421Q-1782_49-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd 5/18	Plan and Profile	No
421Q-1782_50-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd 6/18	Plan and Profile	No
421Q-1782_51-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to 400' East 7/18	Plan and Profile	No
421Q-1782_52-97.tif	421Q-1782	Woodall Rodgers Outfall From Trinity River to 400' East Box Clvt Conn Details 7A/18	Details	No
421Q-1782_53-97.tif	421Q-1782	Woodall Rodgers Outfall From Trinity River to 400' East Multiple Box Clvt Under Levee 8/18	Plan	No
421Q-1782_54-97.tif	421Q-1782	Woodall Rodgers Outfall Cofferdam and Levee Cut 9/18	Plan	No
421Q-1782_55-97.tif	421Q-1782	Woodall Rodgers Outfall Sluice Gate Tower and Foot Bridge 10/18	Plan and Profile	No
421Q-1782_56-97.tif	421Q-1782	Woodall Rodgers Outfall Details of Sluice Gate Tower 11/18	Details	No
421Q-1782_57-97.tif	421Q-1782	Woodall Rodgers Outfall Details of Outfall Structure 12/18	Details	No
421Q-1782_58-97.tif	421Q-1782	Woodall Rodgers Outfall Multiple Box Culvert Detail 13/18	Details	No
421Q-1782_59-97.tif	421Q-1782	Woodall Rodger Outfall Type C Manhole Details 5/6	Details	Yes
421Q-1782_59-97.tif	421Q-1782	Woodall Rodgers Outfall M.B Culvert for Siphon Section 14/18	Details	No

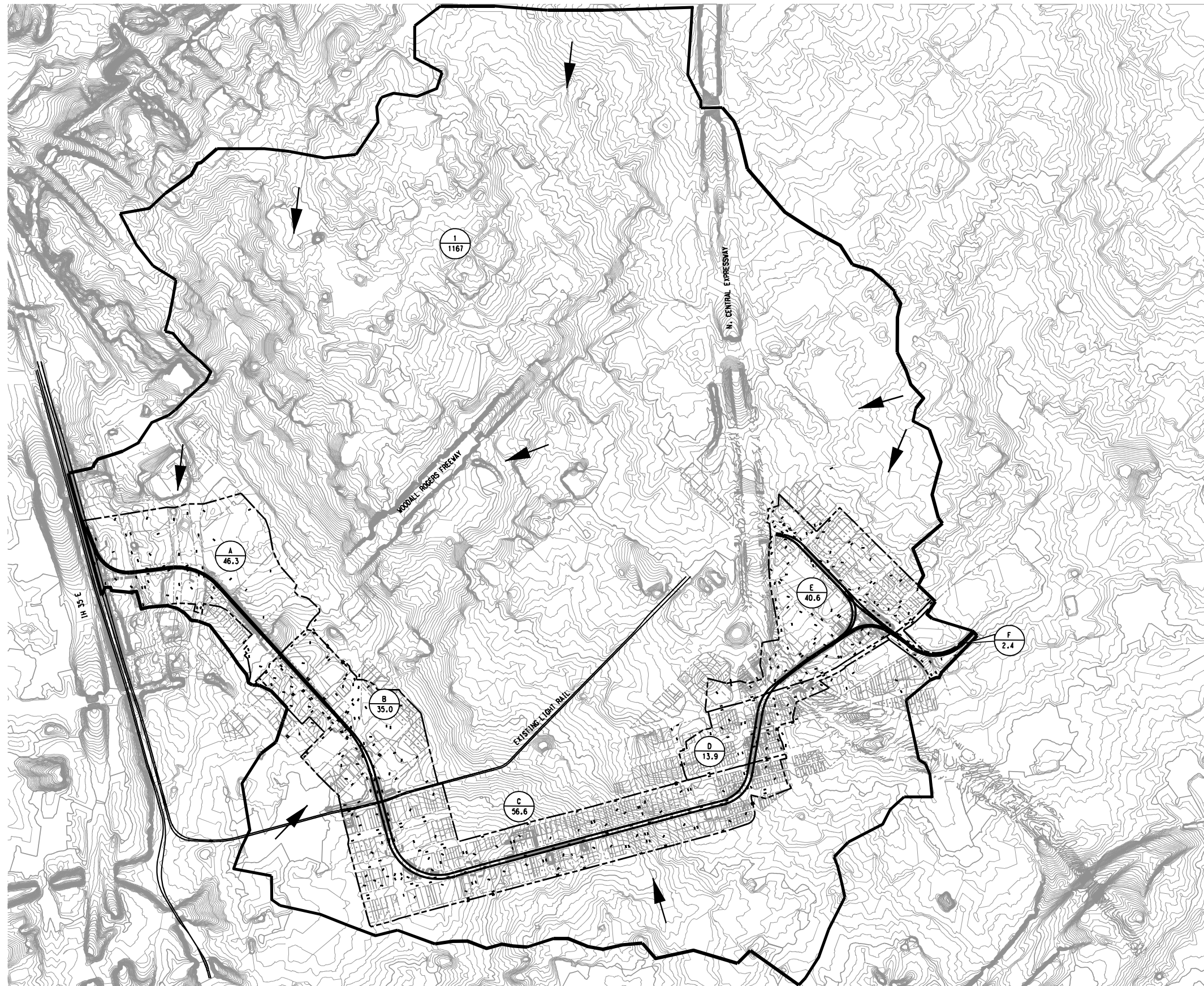
Filename	City of Dallas ID	Description	Print Type	Within LPA D2
421Q-1782_60-97.tif	421Q-1782	Woodall Rodgers Outfall Transition Structure 15A/18	Details	No
421Q-1782_61-97.tif	421Q-1782	Woodall Rodgers Outfall Transition Structure 15/18	Details	No
421Q-1782_62-97.tif	421Q-1782	Woodall Rodgers Outfall Transition Structure 16/18	Details	No
421Q-1782_63-97.tif	421Q-1782	Woodall Rodgers Outfall Foot Bridge Details 17/18	Details	No
421Q-1782_64-97.tif	421Q-1782	Woodall Rodgers Outfall Miscellaneous Details 18/18	Details	No
421Q-1782_65-97.tif	421Q-1782	Woodall Rodgers Outfall Miscellaneous Details 18/18	Details	No
421Q-1782_66-97.tif	421Q-1782	Woodall Rodgers Outfall From Levee to Industrial Blvd VOID	Cover Sheet	No
421Q-1782_67-97.tif	421Q-1782	Continental Ave for Industrial Properties (Storm Sewer)	Plan and Profile	No
421Q-1782_68-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St:Quantity Summary: Storm Sewer	Summary	No
421Q-1782_6-97.tif	421Q-1782	Woodall Rodgers at Field St: 72" RCP Junction Box 6/6	Details	Yes
421Q-1782_69-97.tif	421Q-1782	Continental Ave for Industrial Properties (Storm Sewer)	Plan and Profile	No
421Q-1782_70-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: General Layout	Plan	Yes
421Q-1782_71-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Drainage Area Map Scale 1 in = 400 ft	Plan	Yes
421Q-1782_72-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Drainage Area Map Scale 1 in = 200 ft	Plan	Yes
421Q-1782_73-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Trinity River Outfall	Plan and Profile	Yes
421Q-1782_74-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe Storm Sewer under RR	Plan and Profile	Yes
421Q-1782_75-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe Storm Sewer under RR	Plan and Profile	Yes
421Q-1782_76-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: RR to Industrial Blvd	Plan and Profile	Yes
421Q-1782_77-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: RR to Industrial Blvd	Plan and Profile	Yes
421Q-1782_78-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Industrial Blvd to IH35E	Plan and Profile	Yes
421Q-1782_7-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Cover Sheet, Year 1974) 1/11	Cover Sheet	Yes
421Q-1782_79-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Under MK&T RR tracks	Plan and Profile	Yes
421Q-1782_80-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Continental Blvd to West of Field St.	Plan and Profile	Yes
421Q-1782_81-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: West of Field St. to St. Paul	Plan and Profile	Yes
421Q-1782_82-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: St. Paul to Pearl St.	Plan and Profile	Yes
421Q-1782_83-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Pearl St. to Fairmount	Plan and Profile	Yes
421Q-1782_84-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Laterals around Magnolia and Field	Plan and Profile	Yes
421Q-1782_85-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Lateral Profiles	Profiles	Yes
421Q-1782_86-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Levee Plan and Profile	Plan and Profile	Yes
421Q-1782_87-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Manhole Details Type I and II	Details	Yes
421Q-1782_88-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe storm sewer details	Details	Yes
421Q-1782_8-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Drainage Area Map) 2/11	Plan	Yes
421Q-1782_89-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe storm sewer details	Details	Yes
421Q-1782_90-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe storm sewer Manhole Details	Details	Yes
421Q-1782_91-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe storm sewer Manhole Details	Details	Yes

Filename	City of Dallas ID	Description	Print Type	Within LPA D2
421Q-1782_92-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: 12' Horseshoe storm sewer Manhole Details	Details	Yes
421Q-1782_93-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Construction Shaft Detail	Details	Yes
421Q-1782_94-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Headwall Detail	Details	Yes
421Q-1782_95-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Layout Slide Gate Tower and Foot Bridge	Details	Yes
421Q-1782_96-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Miscellaneous Details	Details	Yes
421Q-1782_97-97.tif	421Q-1782	Spur 366: IH 35E Interchange to Near Field St: Slide Gate and Frame Sections and Details	Details	Yes
421Q-1782_9-97.tif	421Q-1782	Woodall Rodgers Outfall From Industrial Blvd to Field St (Boulevard to Field St) 3/11	Plan and Profile	Yes
421Q-1914_10-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: to Ross Ave) 7A/15	Plan and Profile	No
421Q-1914_11-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Flora to Munger) 8/15	Plan and Profile	No
421Q-1914_1-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Drainage Area Map) 1/15	Plan	No
421Q-1914_12-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Flora to Munger) 8A/15	Plan and Profile	No
421Q-1914_13-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Ross to Cedar Springs Rd) 9/15	Plan and Profile	No
421Q-1914_14-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Ross to Cedar Springs Rd) 10/15	Plan and Profile	No
421Q-1914_15-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: McKinney Ave.) 11/15	Plan and Profile	No
421Q-1914_16-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Cedar Springs Rd) 12/15	Plan and Profile	No
421Q-1914_17-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Cedar Springs Rd) 12/15	Plan and Profile	No
421Q-1914_18-18.tif	421Q-1914	Drainage Plan: Bryan St: From Crockett to Leonard St	Plan and Profile	No
421Q-1914_2-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Drainage Area Map) 1A/15	Plan	No
421Q-1914_3-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Drainage Area Map) 1A/15	Plan	No
421Q-1914_4-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl to Live Oak) 2/15	Plan and Profile	No
421Q-1914_5-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Leonard St to Bryan St) 3/15	Plan and Profile	No
421Q-1914_6-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Along Bryan St and Crockett St.) 4/15	Plan and Profile	No
421Q-1914_7-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: Bryan St West) 5/15	Plan and Profile	No
421Q-1914_8-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: to San Jacinto St.) 6/15	Plan and Profile	No
421Q-1914_9-18.tif	421Q-1914	Pearl St: Pacific Ave to Cedar Springs Rd (Pearl St: to Ross Ave) 7/15	Plan and Profile	No
421Q-4747_1-1.tif	421Q-4747	Final Plat: North Harwood to Elm to North Pearl St to Main St.	Plan	No
421Q-4747_1-6.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW (Paving) (Cover Sheet)	Cover Sheet	No
421Q-4747_3-6.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW (Paving) Civil Utility Plan	Plan	No
421Q-4747_4-6.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW Storm Profiles	Profile	No
421Q-4747_5-6.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW Details	Details	No
421Q-4747_V2-1.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW (Utilities) (Cover Sheet)	Cover Sheet	No
421Q-4747_V2-4.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW (Utilities) (Civil Layout and Paving Plan)	Plan	No

Filename	City of Dallas ID	Description	Print Type	Within LPA D2
421Q-4747_V2-5.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW (Utilities) (Details)	Details	No
421Q-4747_V2-6.tif	421Q-4747	Elm St Parking Garage Improvements Public ROW (Utilities) (Traffic Layout)	Plan	No
421Q-4747_V3-6.tif	421Q-4747	Final Plat: North Harwood to Elm to North Pearl St to Main St.	Plan	No
421Q-479_1.tif	421Q-479	Rehabilitation of Pearl St. Storm Sewer from Eakins to Pacific	Plan and Profile	Yes
421Q-479_2.tif	421Q-479	Storm Sewer & Streets in Vicinity of Preston and Pearl St before & after Central	Plan	Yes
421Q-479_3.tif	421Q-479	Storm Sewer & Streets in Vicinity of Preston and Pearl St before & after Central	Plan	Yes
421Q-479_4.tif	421Q-479	Storm Sewer & Streets in Vicinity of Preston and Pearl St before & after Central	Plan	Yes
421Q-479_5.tif	421Q-479	Storm Sewer & Streets in Vicinity of Preston and Pearl St before & after Central	Plan	Yes
421Q-54_1.tif	421Q-54	Storm Sewer: Gaston Ave at Hawkins and Floyd St.	Plan and Profile	Yes
421Q-56_1.tif	421Q-56	Storm Sewer: Good St from Swiss Ave to Gaston Ave.	Plan and Profile	Yes
421Q-582_1.tif	421Q-582	Storm Sewer along Elm St from East of Preston to Pearl St.	Plan and Profile	Yes
421Q-85_1.tif	421Q-85	Storm Sewer: Diversion Via McKinney Ave. (Houston to Record)	Plan and Profile	Yes
421Q-85_2.tif	421Q-85	Storm Sewer: Diversion Via McKinney Ave. (Record to Griffin)	Plan and Profile	Yes
421Q-85_3.tif	421Q-85	Storm Sewer: Diversion Via McKinney Ave. (Griffin to Field)	Plan and Profile	Yes
421Q-85_4.tif	421Q-85	Storm Sewer: Diversion Via McKinney Ave. Intake and Tunnel Details	Details	Yes
421Q-85_5.tif	421Q-85	Storm Sewer: Diversion Via McKinney Ave. Manhole Shaft	Details	Yes
421Q-85_6.tif	421Q-85	Storm Sewer: Diversion Via McKinney Ave. Air relief at manhole shaft	Details	Yes
421Q-85A_1.tif	421Q-85A	Storm Sewer: In Alley from Parry Ave Westward along T&P tracks	Plan and Profile	No
421Q-916_1-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Cover Sheet)	Plan	Yes
421Q-916_2-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Drainage Area Map)	Plan	Yes
421Q-916_3-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Drainage Area Map)	Plan	Yes
421Q-916_4-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Plan Profile)	Plan and Profile	Yes
421Q-916_5-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Plan Profile)	Plan and Profile	Yes
421Q-916_6-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Detail Junction Box)	Details	Yes
421Q-916_7-7.tif	421Q-916	Plans of Proposed Improvements: Wesley Alley Storm Sewer (Detail Sheet)	Details	Yes
421Q-98_1.tif	421Q-98	Storm Sewer: Dallas Dist. No. 6: Caroline to Cedar Springs Lateral	Plan and Profile	No
421Q-98_2.tif	421Q-98	Storm Sewer: Dallas Dist. No. 6: Caroline to Cedar Springs Lateral	Plan and Profile	No
421Q-98_3.tif	421Q-98	Storm Sewer: Dallas Dist. No. 6: Caroline to Cedar Springs Lateral	Plan and Profile	No
421Q-98_4.tif	421Q-98	Storm Sewer: Dallas Dist. No. 6: Caroline to Cedar Springs Lateral	Plan and Profile	No









Appendix B. Existing Drainage Area Maps



SCALE (IN FEET)

0 250 500 1000

LEGEND

-  DRAINAGE AREA BOUNDARY
 SUBBASIN AREA
 DRAINAGE FLOW
 DRAINAGE AREA NUMBER
 DRAINAGE AREA IN ACRES
 RAIL CENTERLINE

NOT FOR CONSTRUCTION
NOT AN APPROVED DRAWING
PRELIMINARY 20% DESIGN

CONTRACT SHEET No.	OF
--------------------	----

LIGHT RAIL TRANSIT SYSTEM
LINE SECTION CBD-2

OVERALL DRAINAGE AREA MAP

[illegible]

IN-PROGRESS


THIS DOCUMENT IS RELEASED
FOR THE PURPOSE OF REVIEW UNDER THE
AUTHORITY OF:
JEFFREY E. BRISCOE, P.E. NO. 99558
ON 03/06/2020
ICONIC CONSULTING GROUP, INC.
TBPE FIRM NO. F-10715
IT IS NOT TO BE USED FOR CONSTRUCTION OR
PERMIT PURPOSES.



DART PROJECT



SCALE	1" = 400'
DRAWN	K. SIMS
DESIGNED	J. TAYLOR
CHECKED	J. HUDSON
IN CHARGE	J. BRISCOE
DATE	03/06/2020



#####DGN\$SPECIFICATION#####



Appendix C. Existing Drainage Are Calculations

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
A01	4.39	0.95	10	8.88	37.03
A02	0.50	0.95	10	8.88	4.22
A03	4.69	0.95	10	8.88	39.56
A04	1.71	0.95	10	8.88	14.43
A05	1.28	0.95	10	8.88	10.80
A06	10.58	0.95	10	8.88	89.25
A07	4.67	0.95	10	8.88	39.40
A08	3.07	0.95	10	8.88	25.90
A09	2.73	0.95	10	8.88	23.03
A10	1.01	0.95	10	8.88	8.52
A11	0.95	0.95	10	8.88	8.01
A12	0.95	0.95	10	8.88	8.01
A13	0.13	0.95	10	8.88	1.10
A14	0.18	0.95	10	8.88	1.52
A15	0.46	0.95	10	8.88	3.88
A16	0.51	0.95	10	8.88	4.30
A17	0.41	0.95	10	8.88	3.46
A18	0.15	0.95	10	8.88	1.27
A19	1.31	0.95	10	8.88	11.05
A20	1.71	0.95	10	8.88	14.43
A21	0.37	0.95	10	8.88	3.12
A22	0.15	0.95	10	8.88	1.27
A23	4.39	0.95	10	8.88	37.03
TOTAL GROUP A	46.30				

NOTES:

DRAINAGE DESIGN CRITERIA (FREQUENCY, INTENSITY, AND RUNOFF COEFFICIENTS) ARE BASED ON THE CITY OF DALLAS DRAINAGE DESIGN MANUAL, DATED MAY 1993.

1. ALL DRAINAGE AREAS ARE CALCULATED FOR THE 100-YEAR FREQUENCY STORM.
2. ALIGNMENT IS WITHIN THE ZONING DISTRICT: CA-1(A), CENTRAL AREA - 1.
3. INTENSITY WERE DETERMINED USING THE RAINFALL INTENSITY DURATION TABLE LOCATED ON PAGE 2 OF THE APPENDIX.
4. RUNOFF COEFFICIENTS ARE TAKEN FROM THE TABLE: RUNOFF COEFFICIENTS AND MAXIMUM INLET TIMES LOCATED ON PAGE 1 OF THE APPENDIX.

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA (ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
B01	2.22	0.95	10	8.88	18.73
B02	1.01	0.95	10	8.88	8.52
B03	0.90	0.95	10	8.88	7.59
B04	1.26	0.95	10	8.88	10.63
B05	0.87	0.95	10	8.88	7.34
B06	1.33	0.95	10	8.88	11.22
B07	1.48	0.95	10	8.88	12.49
B08	1.08	0.95	10	8.88	9.11
B09	2.60	0.95	10	8.88	21.93
B10	0.47	0.95	10	8.88	3.96
B11	1.86	0.95	10	8.88	15.69
B12	1.06	0.95	10	8.88	8.94
B13	0.14	0.95	10	8.88	1.18
B14	1.57	0.95	10	8.88	13.24
B15	0.98	0.95	10	8.88	8.27
B16	0.35	0.95	10	8.88	2.95
B17	0.05	0.95	10	8.88	0.42
B18	0.62	0.95	10	8.88	5.23
B19	0.45	0.95	10	8.88	3.80
B20	0.45	0.95	10	8.88	3.80
B21	0.31	0.95	10	8.88	2.62
B22	0.14	0.95	10	8.88	1.18
B23	0.09	0.95	10	8.88	0.76
B24	0.40	0.95	10	8.88	3.37
B25	0.42	0.95	10	8.88	3.54
B26	1.04	0.95	10	8.88	8.77
B28	0.99	0.95	10	8.88	8.35
B29	0.29	0.95	10	8.88	2.45
B30	0.27	0.95	10	8.88	2.28
B31	0.64	0.95	10	8.88	5.40
B32	1.04	0.95	10	8.88	8.77
B33	1.13	0.95	10	8.88	9.53
B34	0.15	0.95	10	8.88	1.27
B35	0.12	0.95	10	8.88	1.01
B36	0.98	0.95	10	8.88	8.27
B37	0.23	0.95	10	8.88	1.94
B38	1.07	0.95	10	8.88	9.03
B39	0.44	0.95	10	8.88	3.71
B40	0.34	0.95	10	8.88	2.87
B41	1.07	0.95	10	8.88	9.03
B42	0.77	0.95	10	8.88	6.50
B43	0.48	0.95	10	8.88	4.05
B44	0.84	0.95	10	8.88	7.09
B45	0.26	0.95	10	8.88	2.19
B46	0.37	0.95	10	8.88	3.12

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA (ACRES)	RUNOFF COEFF. "C"	T _c (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
B47	0.14	0.95	10	8.88	1.18
B48	0.13	0.95	10	8.88	1.10
B49	0.11	0.95	10	8.88	0.93
TOTAL GROUP B	35.01				

NOTES:

DRAINAGE DESIGN CRITERIA (FREQUENCY, INTENSITY, AND RUNOFF COEFFICIENTS) ARE BASED ON THE CITY OF DALLAS DRAINAGE DESIGN MANUAL, DATED MAY 1993.

1. ALL DRAINAGE AREAS ARE CALCULATED FOR THE 100-YEAR FREQUENCY STORM.
2. ALIGNMENT IS WITHIN THE ZONING DISTRICT: CA-1(A), CENTRAL AREA - 1.
3. INTENSITY WERE DETERMINED USING THE RAINFALL INTENSITY DURATION TABLE LOCATED ON PAGE 2 OF THE APPENDIX.
4. RUNOFF COEFFICIENTS ARE TAKEN FROM THE TABLE: RUNOFF COEFFICIENTS AND MAXIMUM INLET TIMES LOCATED ON PAGE 1 OF THE APPENDIX.

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
C01	0.24	0.95	10	8.88	2.02
C02	0.39	0.95	10	8.88	3.29
C03	0.10	0.95	10	8.88	0.84
C04	2.08	0.95	10	8.88	17.55
C05	1.33	0.95	10	8.88	11.22
C06	0.37	0.95	10	8.88	3.12
C07	1.08	0.95	10	8.88	9.11
C08	0.73	0.95	10	8.88	6.16
C09	0.54	0.95	10	8.88	4.56
C10	1.94	0.95	10	8.88	16.37
C11	0.84	0.95	10	8.88	7.09
C12	0.63	0.95	10	8.88	5.31
C13	0.95	0.95	10	8.88	8.01
C14	0.16	0.95	10	8.88	1.35
C15	2.99	0.95	10	8.88	25.22
C16	0.30	0.95	10	8.88	2.53
C17	1.00	0.95	10	8.88	8.44
C18	1.22	0.95	10	8.88	10.29
C19	0.24	0.95	10	8.88	2.02
C20	0.80	0.95	10	8.88	6.75
C21	1.01	0.95	10	8.88	8.52
C22	0.61	0.95	10	8.88	5.15
C23	1.74	0.95	10	8.88	14.70
C24	0.12	0.95	10	8.88	1.01
C25	2.23	0.95	10	8.88	18.81
C26	1.49	0.95	10	8.88	12.57
C27	2.51	0.95	10	8.88	21.17
C28	0.11	0.95	10	8.88	0.93
C29	0.43	0.95	10	8.88	3.63
C30	1.48	0.95	10	8.88	12.49
C31	1.41	0.95	10	8.88	11.89
C32	2.14	0.95	10	8.88	18.05
C33	1.24	0.95	10	8.88	10.46
C34	1.02	0.95	10	8.88	8.60
C35	0.37	0.95	10	8.88	3.12
C36	0.28	0.95	10	8.88	2.36
C37	0.12	0.95	10	8.88	1.01
C38	0.03	0.95	10	8.88	0.25
C39	2.80	0.95	10	8.88	23.62
C40	0.83	0.95	10	8.88	7.00
C41	2.85	0.95	10	8.88	24.04
C42	0.11	0.95	10	8.88	0.93
C43	1.03	0.95	10	8.88	8.69
C44	0.11	0.95	10	8.88	0.93
C45	1.24	0.95	10	8.88	10.46

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
C46	0.88	0.95	10	8.88	7.42
C47	0.71	0.95	10	8.88	5.99
C48	2.36	0.95	10	8.88	19.91
C49	1.06	0.95	10	8.88	8.94
C50	0.17	0.95	10	8.88	1.43
C51	0.92	0.95	10	8.88	7.76
C52	0.16	0.95	10	8.88	1.35
C53	0.15	0.95	10	8.88	1.27
C54	3.46	0.95	10	8.88	29.19
C55	1.14	0.95	10	8.88	9.62
C56	0.33	0.95	10	8.88	2.78
TOTAL GROUP C	56.58				

NOTES:

DRAINAGE DESIGN CRITERIA (FREQUENCY, INTENSITY, AND RUNOFF COEFFICIENTS) ARE BASED ON THE CITY OF DALLAS DRAINAGE DESIGN MANUAL, DATED MAY 1993.

1. ALL DRAINAGE AREAS ARE CALCULATED FOR THE 100-YEAR FREQUENCY STORM.
2. ALIGNMENT IS WITHIN THE ZONING DISTRICT: CA-1(A), CENTRAL AREA - 1.
3. INTENSITY WERE DETERMINED USING THE RAINFALL INTENSITY DURATION TABLE LOCATED ON PAGE 2 OF THE APPENDIX.
4. RUNOFF COEFFICIENTS ARE TAKEN FROM THE TABLE: RUNOFF COEFFICIENTS AND MAXIMUM INLET TIMES LOCATED ON PAGE 1 OF THE APPENDIX.

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
D01	0.26	0.95	10	8.88	2.19
D02	0.82	0.95	10	8.88	6.92
D03	1.24	0.95	10	8.88	10.46
D04	0.44	0.95	10	8.88	3.71
D05	0.50	0.95	10	8.88	4.22
D06	0.84	0.95	10	8.88	7.09
D07	0.44	0.95	10	8.88	3.71
D08	0.96	0.95	10	8.88	8.10
D09	1.54	0.95	10	8.88	12.99
D10	0.71	0.95	10	8.88	5.99
D11	0.38	0.95	10	8.88	3.21
D12	2.16	0.95	10	8.88	18.22
D13	0.95	0.95	10	8.88	8.01
D14	0.95	0.95	10	8.88	8.01
D15	0.09	0.95	10	8.88	0.76
D16	0.95	0.95	10	8.88	8.01
D17	0.67	0.95	10	8.88	5.65
TOTAL GROUP D	13.90				

NOTES:

DRAINAGE DESIGN CRITERIA (FREQUENCY, INTENSITY, AND RUNOFF COEFFICIENTS) ARE BASED ON THE CITY OF DALLAS DRAINAGE DESIGN MANUAL, DATED MAY 1993.

1. ALL DRAINAGE AREAS ARE CALCULATED FOR THE 100-YEAR FREQUENCY STORM.
2. ALIGNMENT IS WITHIN THE ZONING DISTRICT: CA-1(A), CENTRAL AREA - 1.
3. INTENSITY WERE DETERMINED USING THE RAINFALL INTENSITY DURATION TABLE LOCATED ON PAGE 2 OF THE APPENDIX.
4. RUNOFF COEFFICIENTS ARE TAKEN FROM THE TABLE: RUNOFF COEFFICIENTS AND MAXIMUM INLET TIMES LOCATED ON PAGE 1 OF THE APPENDIX.

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
E01	0.18	0.95	10	8.88	1.52
E02	0.42	0.95	10	8.88	3.54
E03	0.35	0.95	10	8.88	2.95
E04	0.24	0.95	10	8.88	2.02
E05	0.25	0.95	10	8.88	2.11
E06	0.31	0.95	10	8.88	2.62
E07	0.19	0.95	10	8.88	1.60
E08	1.00	0.95	10	8.88	8.44
E09	0.30	0.95	10	8.88	2.53
E10	0.51	0.95	10	8.88	4.30
E11	1.42	0.95	10	8.88	11.98
E12	1.77	0.95	10	8.88	14.93
E13	2.58	0.95	10	8.88	21.76
E14	1.31	0.95	10	8.88	11.05
E15	0.46	0.95	10	8.88	3.88
E16	0.94	0.95	10	8.88	7.93
E17	1.03	0.95	10	8.88	8.69
E18	0.34	0.95	10	8.88	2.87
E19	0.23	0.95	10	8.88	1.94
E20	0.46	0.95	10	8.88	3.88
E21	0.20	0.95	10	8.88	1.69
E22	0.20	0.95	10	8.88	1.69
E23	0.13	0.95	10	8.88	1.10
E24	0.10	0.95	10	8.88	0.84
E25	0.19	0.95	10	8.88	1.60
E26	0.15	0.95	10	8.88	1.27
E27	0.11	0.95	10	8.88	0.93
E28	0.05	0.95	10	8.88	0.42
E29	0.13	0.95	10	8.88	1.10
E30	0.18	0.95	10	8.88	1.52
E31	0.09	0.95	10	8.88	0.76
E32	0.04	0.95	10	8.88	0.34
E33	0.14	0.95	10	8.88	1.18
E34	0.16	0.95	10	8.88	1.35
E35	0.17	0.95	10	8.88	1.43
E36	0.23	0.95	10	8.88	1.94
E37	0.17	0.95	10	8.88	1.43
E38	0.08	0.95	10	8.88	0.67
E39	0.14	0.95	10	8.88	1.18
E40	0.07	0.95	10	8.88	0.59
E41	0.15	0.95	10	8.88	1.27
E42	0.16	0.95	10	8.88	1.35
E43	0.15	0.95	10	8.88	1.27
E44	0.11	0.95	10	8.88	0.93
E45	0.20	0.95	10	8.88	1.69

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
E46	0.15	0.95	10	8.88	1.27
E47	0.22	0.95	10	8.88	1.86
E48	0.17	0.95	10	8.88	1.43
E49	0.24	0.95	10	8.88	2.02
E50	0.63	0.95	10	8.88	5.31
E51	0.35	0.95	10	8.88	2.95
E52	0.99	0.95	10	8.88	8.35
E53	0.53	0.95	10	8.88	4.47
E54	0.47	0.95	10	8.88	3.96
E55	1.19	0.95	10	8.88	10.04
E56	1.28	0.95	10	8.88	10.80
E57	0.92	0.95	10	8.88	7.76
E58	0.75	0.95	10	8.88	6.33
E59	0.22	0.95	10	8.88	1.86
E60	0.97	0.95	10	8.88	8.18
E61	0.13	0.95	10	8.88	1.10
E62	0.07	0.95	10	8.88	0.59
E63	0.21	0.95	10	8.88	1.77
E64	0.13	0.95	10	8.88	1.10
E65	0.13	0.95	10	8.88	1.10
E66	0.81	0.95	10	8.88	6.83
E67	0.69	0.95	10	8.88	5.82
E68	0.25	0.95	10	8.88	2.11
E69	1.03	0.95	10	8.88	8.69
E70	1.62	0.95	10	8.88	13.67
E71	0.25	0.95	10	8.88	2.11
E72	0.58	0.95	10	8.88	4.89
E73	0.39	0.95	10	8.88	3.29
E74	1.52	0.95	10	8.88	12.82
E75	0.35	0.95	10	8.88	2.95
E76	1.99	0.95	10	8.88	16.79
E77	0.84	0.95	10	8.88	7.09
E78	2.75	0.95	10	8.88	23.20
TOTAL GROUP E	40.61				

NOTES:

DRAINAGE DESIGN CRITERIA (FREQUENCY, INTENSITY, AND RUNOFF COEFFICIENTS) ARE BASED ON THE CITY OF DALLAS DRAINAGE DESIGN MANUAL, DATED MAY 1993.

1. ALL DRAINAGE AREAS ARE CALCULATED FOR THE 100-YEAR FREQUENCY STORM.

2. ALIGNMENT IS WITHIN THE ZONING DISTRICT: CA-1(A), CENTRAL AREA - 1.

3. INTENSITY WERE DETERMINED USING THE RAINFALL INTENSITY DURATION TABLE LOCATED ON PAGE 2 OF THE APPENDIX.

4. RUNOFF COEFFICIENTS ARE TAKEN FROM THE TABLE: RUNOFF COEFFICIENTS AND MAXIMUM INLET TIMES LOCATED ON PAGE 1 OF THE APPENDIX.

DART D2: DRAINAGE AREA CALCULATIONS

DRAINAGE AREA NO.	AREA(ACRES)	RUNOFF COEFF. "C"	Tc (MIN.)	1 (100-YR) (IN/HR)	Q (100 YR) (CFS)
F01	0.68	0.95	10	8.88	5.74
F02	0.07	0.95	10	8.88	0.59
F03	0.48	0.95	10	8.88	4.05
F04	0.32	0.95	10	8.88	2.70
F05	0.21	0.95	10	8.88	1.77
F06	0.33	0.95	10	8.88	2.78
F07	0.14	0.95	10	8.88	1.18
F08	0.12	0.95	10	8.88	1.01
TOTAL GROUP F	2.35				

NOTES:

DRAINAGE DESIGN CRITERIA (FREQUENCY, INTENSITY, AND RUNOFF COEFFICIENTS) ARE BASED ON THE CITY OF DALLAS DRAINAGE DESIGN MANUAL, DATED MAY 1993.

1. ALL DRAINAGE AREAS ARE CALCULATED FOR THE 100-YEAR FREQUENCY STORM.
2. ALIGNMENT IS WITHIN THE ZONING DISTRICT: CA-1(A), CENTRAL AREA - 1.
3. INTENSITY WERE DETERMINED USING THE RAINFALL INTENSITY DURATION TABLE LOCATED ON PAGE 2 OF THE APPENDIX.
4. RUNOFF COEFFICIENTS ARE TAKEN FROM THE TABLE: RUNOFF COEFFICIENTS AND MAXIMUM INLET TIMES LOCATED ON PAGE 1 OF THE APPENDIX.