City of Broken Arrow

Broken Arrow, Oklahoma

Streetscape Lighting Study

from College Street to Fort Worth Street along Main Street

July 31ST, 2012

CA# 2958 EXP. 6/30/13

MKEC
ENGINEERING
CONSULTANTS, INC.

Purpose

The purpose of this study is as follows:

- Document existing lighting conditions

This lighting study examines the existing lighting conditions present on April 2nd 2012. The weather was cloudy, windy, dark and cool. Moonlight was inhibited due to cloudy conditions. The study began approximately 8:45pm CST and concluded approximately 10:15pm CST. The study boundary covered approximately ½ blocks east and west of Main Street between College Street and Fort Worth Street in the City of Broken Arrow in Broken Arrow, Oklahoma.

Included in this study are the following supporting documents:

- Lighting Map indication locations light level readings were taken. These are included at the end of this report labeled as Exhibit 1 – Exhibit 5.

Observations

Physical observations of the study site are listed below and addressed in the Summary to some extent. These observations are not to be deemed as 100% accurate as some items such as the pole height and arm lengths have not been verified.

- Existing street lighting along Main Street consists of pole mounted cobra head fixtures mounted to 30'-0" pole with 6'-0" arm, a decorative post top fixture mounted to 15'-0" pole, and a decorative acorn fixture mounted to a 20'-0" pole with a 4'-0" arm alternating down both sides of main street.

- Existing street lighting along Main Street utilizes High Pressure Sodium (HPS) lamps which provide a yellowish orange light. These lamps are relatively efficient in terms of lumens/watt but have poor color rendering and less than optimal eye response which prevents a person observing objects to see them in their true color.

- The Museum on Main Street and adjacent space utilizes white light lamps for soffit lighting and tree up-lighting.

- Approximately 10 of the street lighting fixtures within the project study site were burned out, not functioning, or located behind an obstacle that prevented light from reaching the ground surface where the light level readings were taken.

- The area along Main Street proper felt secure and well lit overall.

Existing Lighting System Light Levels (FC) East side of Main Street:

Light level readings were taken at ground level and represent the horizontal light level in foot-candles for a particular location within the area studied. Reference Exhibits 1-5 at the end of this study for a corresponding map indicating the locations where light levels were taken.

1)	0.6
2)	1.3
3)	1.4
4)	1.6
5)	1.2
6)	1.3
7)	1.1
8)	1.2
9)	1.9
10)	2.1
11)	0.8
12)	0.6
13)	0.3
14)	0.6
15)	1.2
16)	1.2
17)	0.7
18)	2.8
19)	1.2
20)	2.7
21)	3.5
22)	2.4
23)	3.0
24)	2.1
25)	1.4
26)	0.3
27)	0.4
28)	0.8
29)	1.4
30)	1.2
31)	0.4
32)	1.4
33)	1.4
34)	1.3
35)	0.6
36)	0.3

37) 0.9
38) 0.2
39) 0.2

Existing Lighting System Light Levels (FC) West side of Main Street:

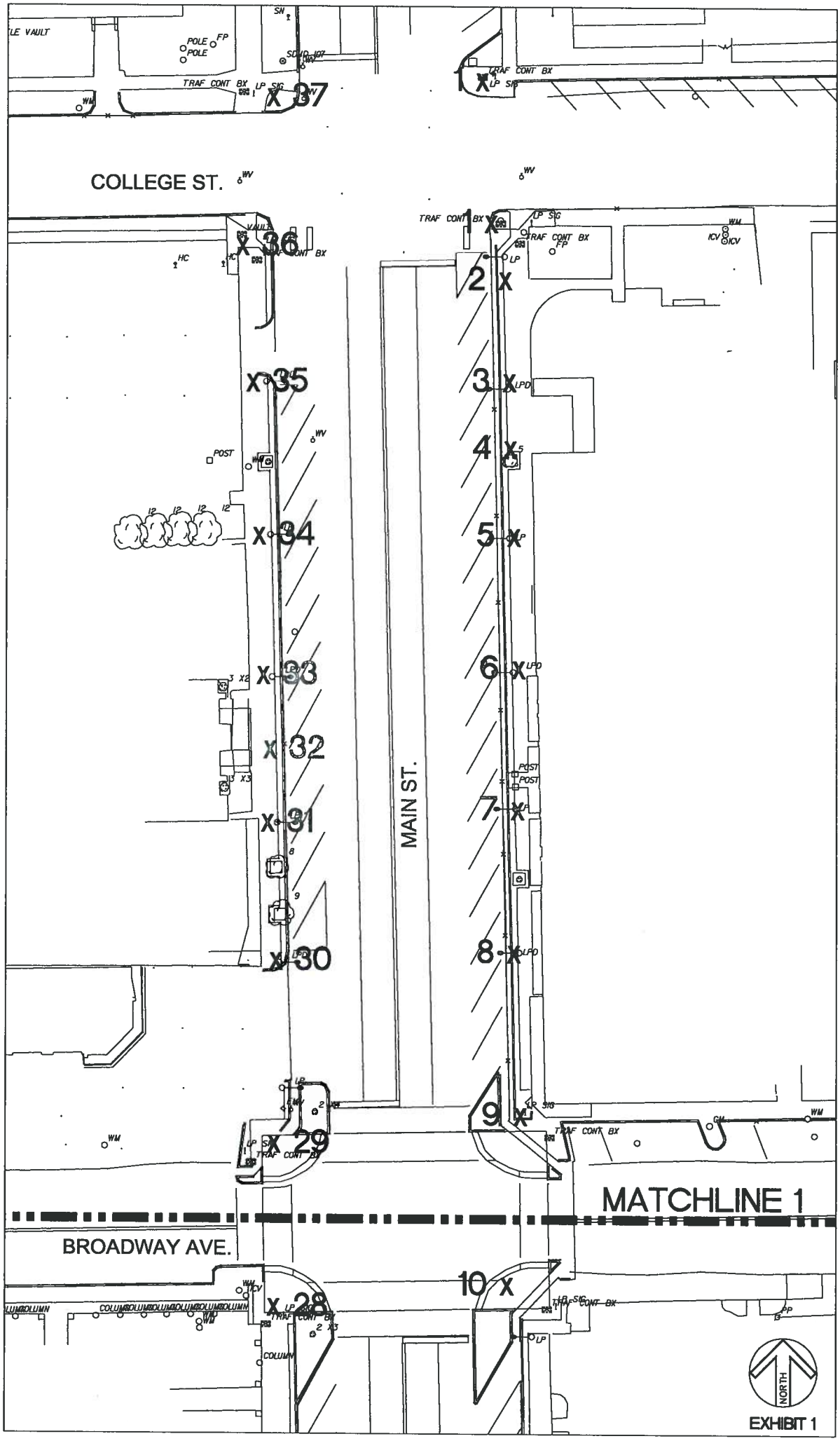
Light level readings were taken at ground level and represent the horizontal light level in foot-candles for a particular location within the area studied. Reference Exhibits 1-5 at the end of this study for a corresponding map indicating the locations where light levels were taken.

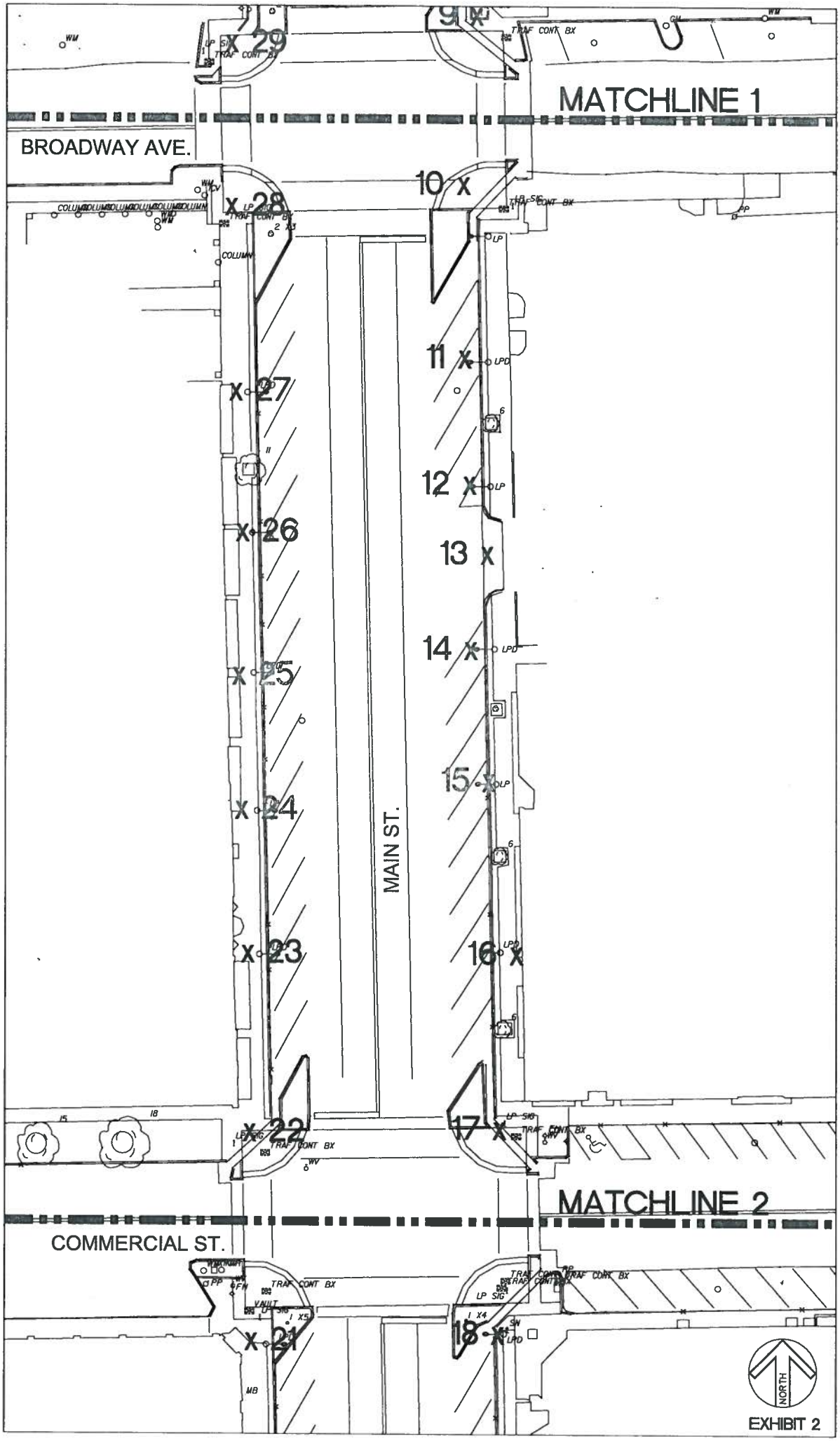
1) 0.0
2) 0.2
3) 0.2
4) 0.2
5) 0.6
6) 3.9
7) 0.4
8) 0.8
9) 1.3
10) 1.0
11) 1.1
12) 2.5
13) 0.9
14) 1.0
15) 2.4
16) 2.5
17) 3.3
18) 1.8
19) 3.7
20) 2.9
21) 3.0
22) 2.6
23) 2.0
24) 1.7
25) 1.6
26) 0.7
27) 1.3
28) 1.9
29) 1.3
30) 1.2
31) 1.2
32) 1.2
33) 1.1

34) 0.8
35) 0.7
36) 1.9
37) 1.5

Summary:

The project area studied along Main Street between College and Fort Worth was observed to be overall well lit and secure. The light levels are within Illumination Engineer Society (IES) recommendations at most locations along Main Street proper. Intersections where pedestrian and vehicular traffic coincide are also where the highest light levels were recorded which is in line with IES recommendations for safety and security. The side streets traveling East/West intersecting with Main Street within the project study area are poorly lit. Light levels dramatically drop off as you move away from Main Street in both East and West directions and do not meet IES light level recommendations for vehicular or pedestrian traffic. Increasing light levels in these is encouraged though the light levels should not be increased to the intensity currently installed along Main Street proper. This is in part because gradually decreasing light levels from along Main Street traveling into the residential neighborhood will allow the human eye to adapt to the lower light levels over a greater distance decreasing eye stress and increasing visibility of both pedestrian and vehicular traffic. In order to mitigate potential negative effects on the existing residential neighborhoods future lighting design should consider implementing full-cut off fixtures while shielding fixtures and mounting to shorter height poles to minimize the light trespass onto adjacent residential neighborhoods. The new fixtures selected should be relative to the style and height of fixtures on Main Street to provide continuity.


COLLEGE ST.
MAIN ST.
BROADWAY AVE.
MATCHLINE 1
NORTH
EXHIBIT 1


MATCHLINE 1
BROADWAY AVE.
MAIN ST.
MATCHLINE 2
COMMERCIAL ST.
NORTH
EXHIBIT 2

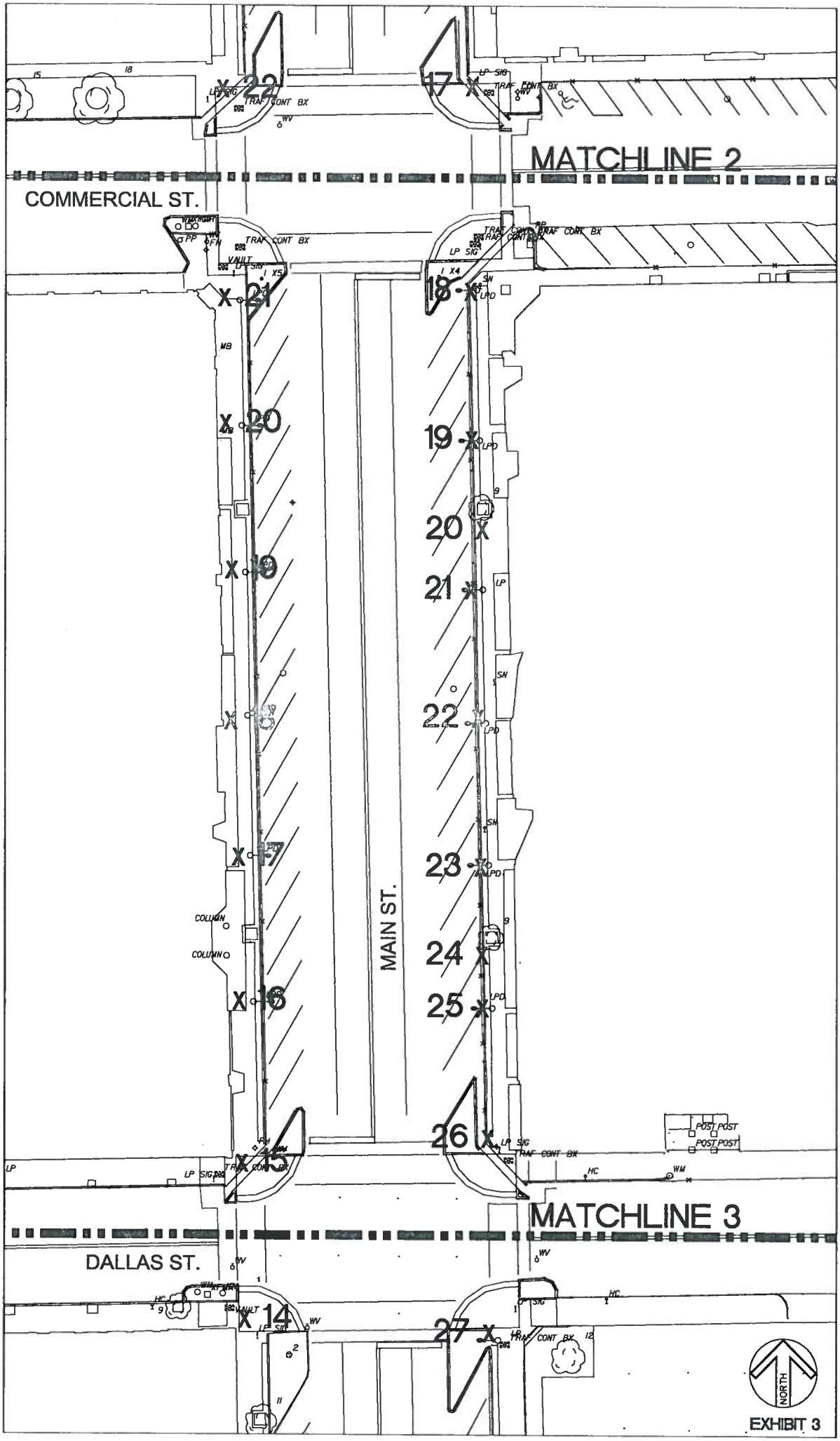
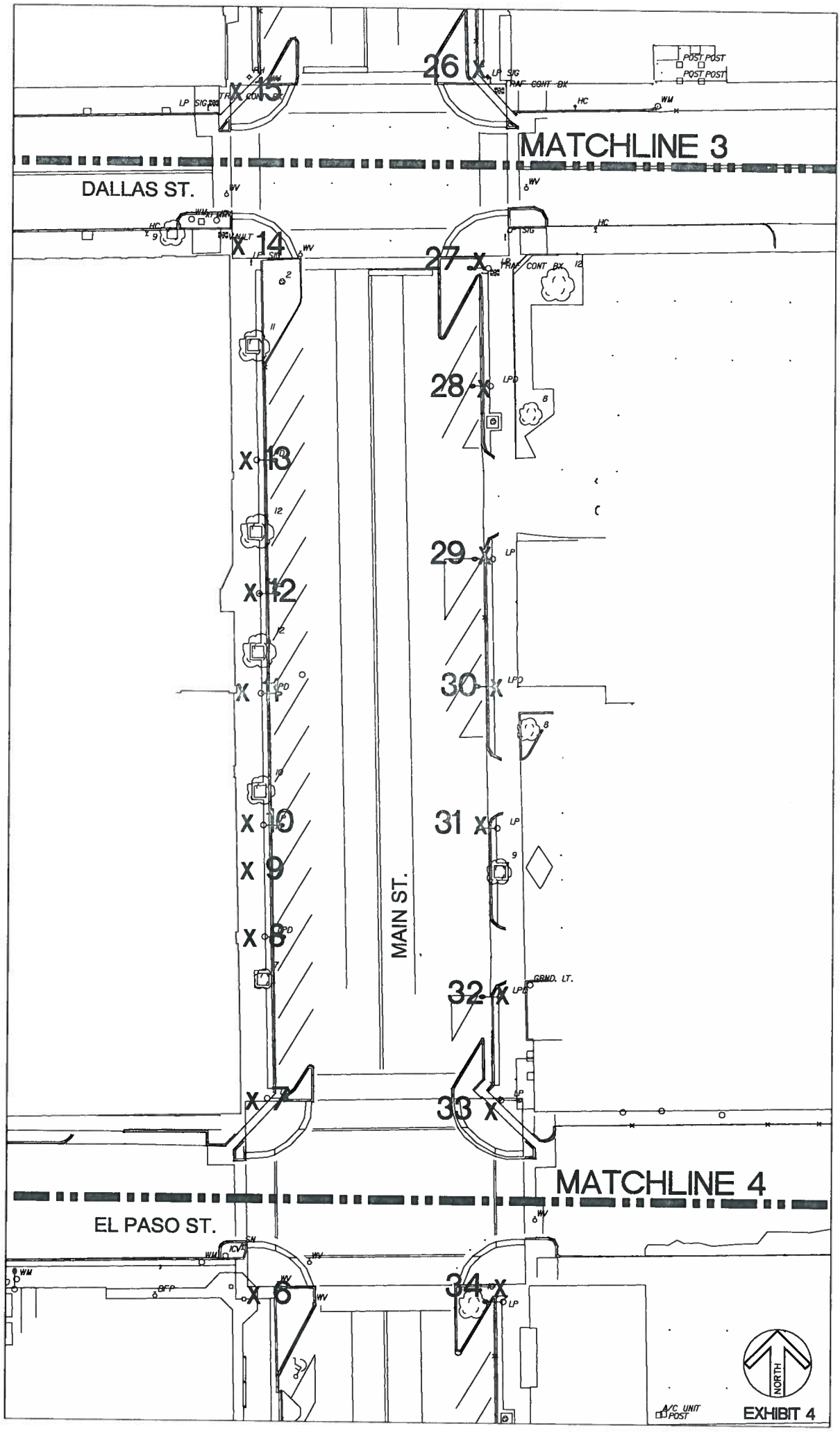
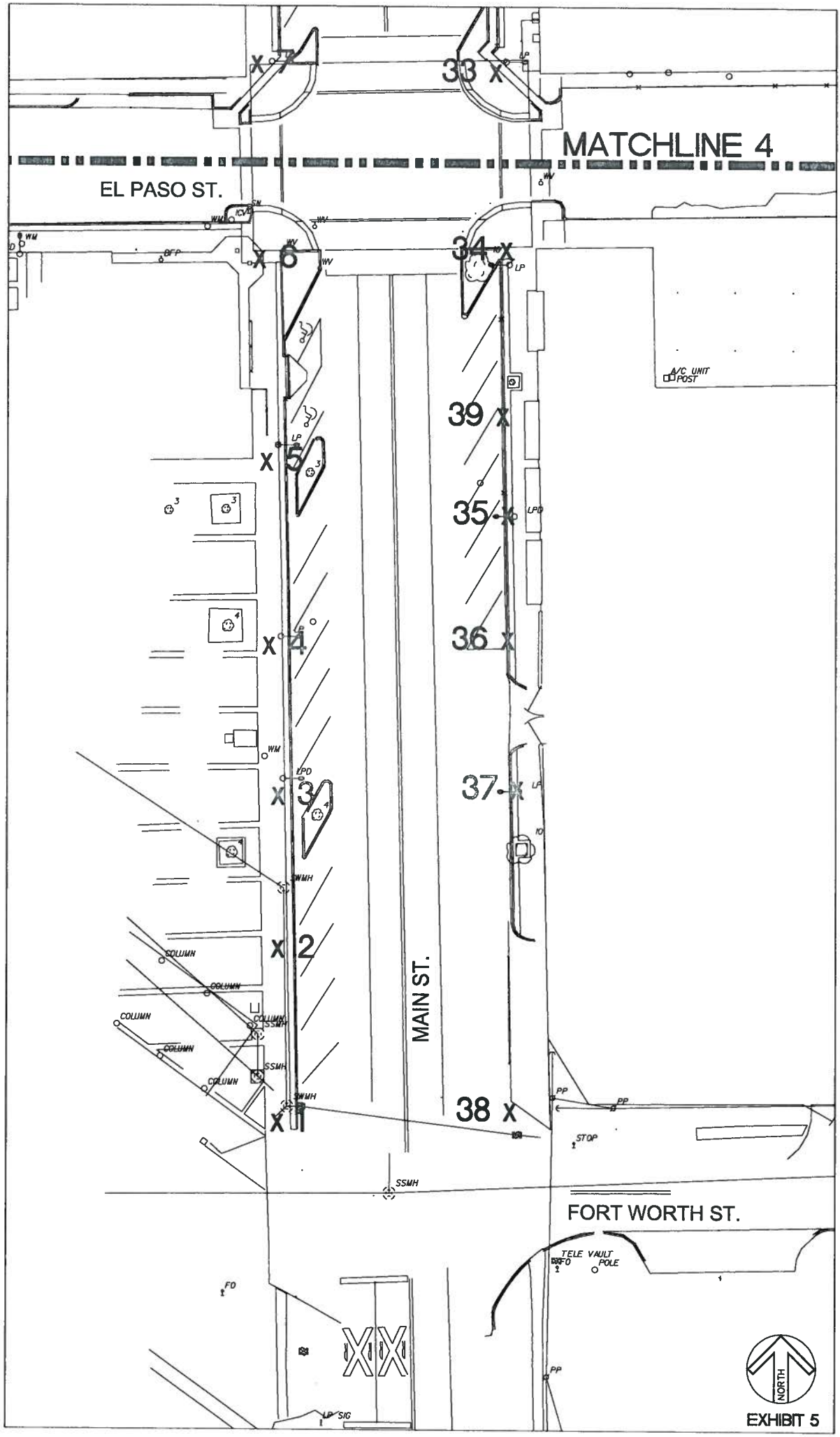

MATCHLINE 2
COMMERCIAL ST.
MAIN ST.
MATCHLINE 3
DALLAS ST.
NORTH

EXHIBIT 3


MATCHLINE 3
DALLAS ST.
MAIN ST.
MATCHLINE 4
EL PASO ST.
15
14
13
12
10
9
8
7
6
26
27
28
29
30
31
32
33
34
POST POST
POST POST
LP SIG
TRAF CONT BX
HC
WM
WV
LPD
GRND. LT.
A/C UNIT
POST
NORTH
EXHIBIT 4


MATCHLINE 4
EL PASO ST.
MAIN ST.
FORT WORTH ST.
A/C UNIT POST
TELE VAULT
POLE
SSMH
SWMH
COLUMN
STOP
NORTH
EXHIBIT 5