



## TECHNICAL MEMORANDUM

To: Mr. Douglas G. Williams  
Director  
Transportation Services  
Texas A&M University

From: C. Brian Shamburger, P.E., PTOE  
Kimley-Horn and Associates, Inc.  
State of Texas Registered Firm #928

Date: August 5, 2011

Subject: N. Bizzell Street Proposed Pedestrian Improvements Evaluation  
Texas A&M University, College Station, Texas

Per your request, we have reviewed the pedestrian accommodation along N. Bizzell Street from just north of Polo Road to Ross Street. Based on our review we offer the following comments and recommendations (see also the attached **Exhibit 1**):

1. Based on our field observations and review of the 2006 Bizzell Street Speed and Pedestrian Study, installation of an all-way stop at the intersection of N. Bizzell Street and Polo Road is appropriate given the high vehicle and pedestrian conflicts at this intersection. In order to provide an all-way stop controlled intersection, the following paving and signs and markings improvements are recommended:
  - a. The existing intersection curb radii should not be modified (see Note 2 on the following page).
  - b. All existing crosswalk and stop bar pavement markings should be obliterated.
  - c. The existing crosswalk, curb ramps, and median cut-thru serving the crosswalk along the south side of the intersection should be removed.
  - d. New curb ramps should be installed in the southeast and southwest corners of the intersection. The design of these curb ramps should be similar to the existing curb ramp in the northeast corner of the intersection (see photo in **Exhibit 2**).
  - e. New international (or ladder style) crosswalks and stop bars should be installed across all approaches to the intersection.
  - f. Stop signs should be installed on all four approaches and in the existing north-south medians.
  - g. In order to accommodate the proposed crosswalk along the south approach, the existing median nose on the south side of the intersection should be pulled back to the south. An existing street light is located in the existing median. Based on field observations, the median nose can be modified without having to relocate the existing light pole (see **Exhibit 3**).
  - h. In order to accommodate the proposed crosswalk along the east approach, the existing narrow raised median and channelizing island should be removed. The existing stop sign post in the island



- should be removed, and the existing yield sign panel should be replaced with the existing stop sign panel salvaged from the island.
- i. Polo Road should be striped as a two-lane approach with a shared thru/left-turn lane and a right-turn only lane.
2. The existing curb return radius for the southeast corner of N. Bizzell Street and Polo Road should remain in place. The existing radius is needed to accommodate a large design vehicle (e.g., campus bus, RV, Single-Unit truck, etc.). **Exhibits 4 and 5** illustrate the minimum bus turning path based on the existing radius and a shorter radius. Any shorter radius would require a vehicle to either jump the curb or encroach onto oncoming traffic along Polo Road.
  3. The existing drop-off area in front of Wisenbaker Engineering Research Center (WERC) should be eliminated and replaced with a raised curb and concrete sidewalk. A new curb ramp should be installed at the existing mid-block crosswalk. The existing bus stop sign within the existing drop-off area should be relocated approximately 50 feet south. If Dura-Curb or Gorilla posts are installed, the area behind the posts will gather debris and be difficult to maintain, and pedestrian visibility for southbound traffic would be reduced; therefore, these temporary treatments are not recommended.
  4. Current plans are to install in-roadway warning lights at the mid-block crosswalk in front of WERC. Based on our discussions with the vendor who provided the existing in-roadway lights, the existing lights are independently solar powered, not hard-wired, and cannot be reused. In lieu of replacing the existing lights with a new installation, we recommend installing Rectangular Rapid Flashing Beacons (RRFB). We have talked to various representatives from vendor companies and they have provided the following estimated yield compliance (vehicles stopping for pedestrians when the lights start flashing) for three different device options:
    - a. Rectangular Rapid Flashing Beacons only – 80-90%
    - b. Normal yellow flashing circular beacons only – 15-20%
    - c. In-roadway flashing lights only – 60-70%

Due to the wide median, RRFBs and pedestrian crossing sign assemblies (W11-2 and W16-7P) should be installed at each end of the crossing for both directions of travel (4 total). In order to ensure a high activation rate from pedestrians, in lieu of push buttons we recommend using a passive detection system such as microwave detection. Microwave detection panels should be mounted on each sign post assembly and detection zones would be configured to accommodate pedestrians as they enter the street and median. All hardware would be powered through solar powered panels with battery backups.

The hardware cost to install a new RRFB system will vary depending on the vendor and final system configuration. Based on discussions with a local vendor (Eltec), the proposed RRFB system will cost approximately \$6,000 per sign post assembly (see attached quote). The proposed four pole system would therefore cost approximately \$24,000. It should also be noted that these costs are for materials only and do not include installation labor.



As mentioned for the Agronomy Road study, use of the RRFB is currently allowed through interim approval by TxDOT and the Federal Highway Administration (FHWA). If the University agrees to install the RRFB, the University will need to send an official request letter to TxDOT requesting blanket approval throughout campus (i.e., one time only request).

5. The middle and southernmost sidewalks coming from parking area 47 (PA 47) should be reoriented to N. Bizzell Street as shown on **Exhibit 1**.
6. The existing northbound left-turn lane and median opening just north of Ross Street should be removed and replaced with a raised curb and landscaping/sod.
7. A controlled access gate should be installed across the existing driveway serving WERC.
8. The existing mid-block pedestrian crossing just north of Ross Street should be removed. The existing curb ramps serving this crossing should also be removed. The median cut through ramp could be eliminated as part of the removal of the adjacent northbound left-turn lane and median opening.
9. New crosswalks, stop bar, and yield pavement markings should be installed along the north side of the intersection of N. Bizzell Street and Ross Street. New ADA compliant curb ramps should be installed on the northeast and northwest corners and through the existing islands. The existing stop and yield signs may need to be relocated to accommodate the proposed pavement markings and curb ramp installations.
10. Although a low priority, the University may want to consider installing a raised fence in the median between Ross Street and Polo Road. Installation of a fence should only be considered after recommendations 1 – 9 are implemented and pedestrians are observed crossing N. Bizzell Street at dangerous, unmarked locations.

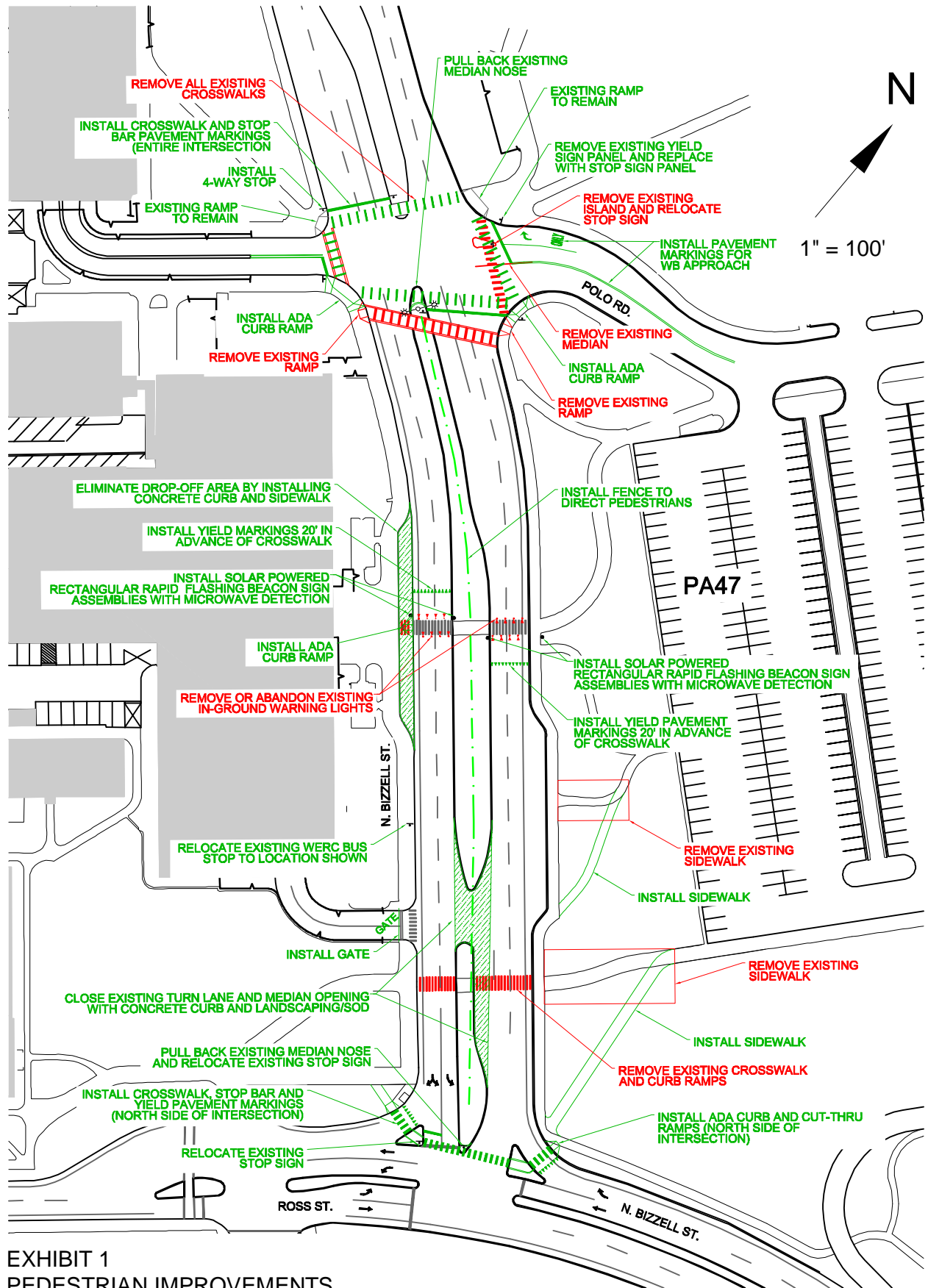


EXHIBIT 1  
 PEDESTRIAN IMPROVEMENTS  
 N. BIZZELL STREET



**Exhibit 2. Existing curb ramp design in NE corner of N. Bizzell Street  
and Polo Road**



**Exhibit 3. Existing east-west crosswalk, median nose, and street light pole on south side of N. Bizzell Street and Polo Road**

N  
1" = 50'

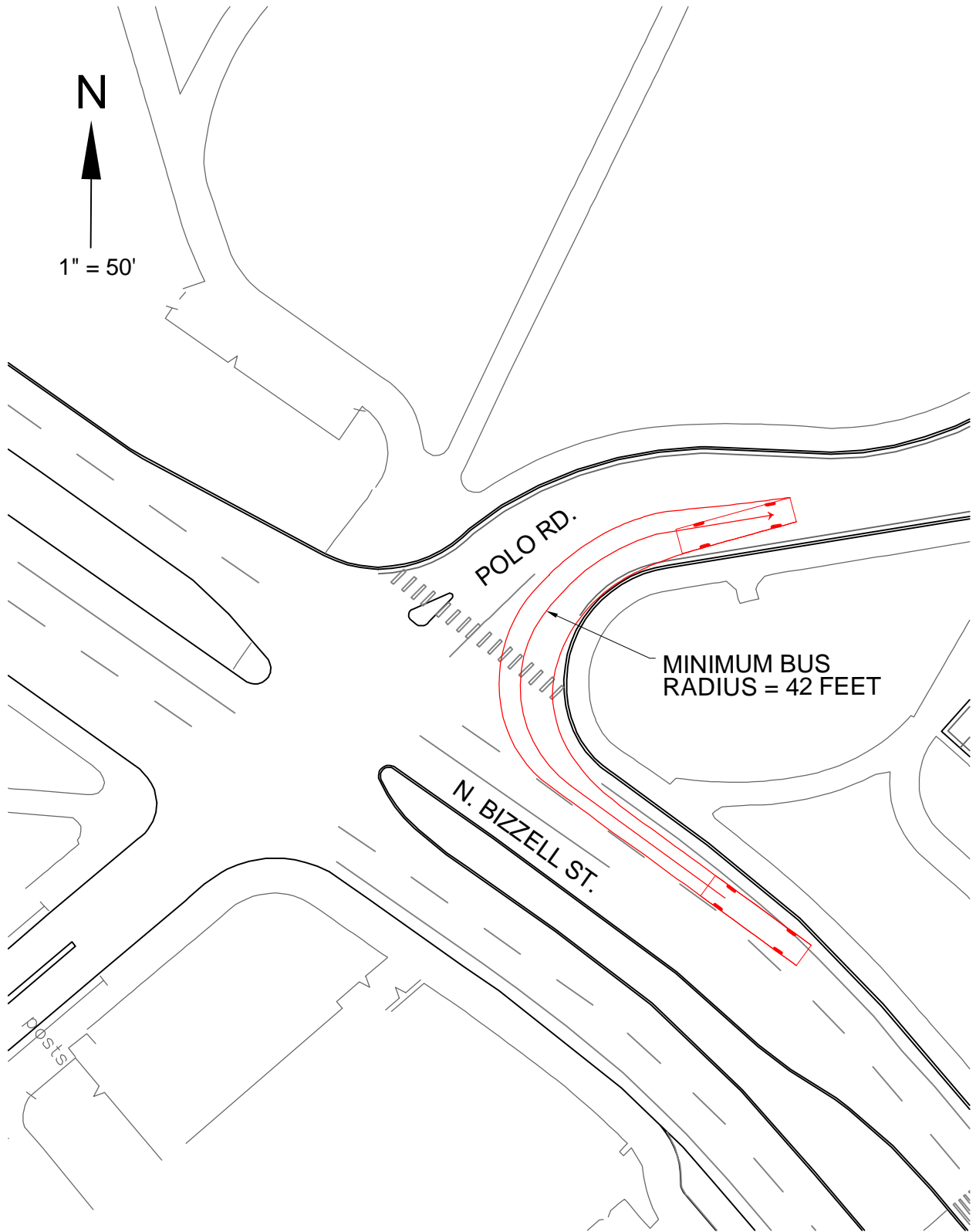


EXHIBIT 4  
AUTOTURN SIMULATION (40' BUS) WITH EXISTING CURB RETURN RADIUS  
N. BIZZELL STREET AT POLO ROAD

N  
1" = 50'

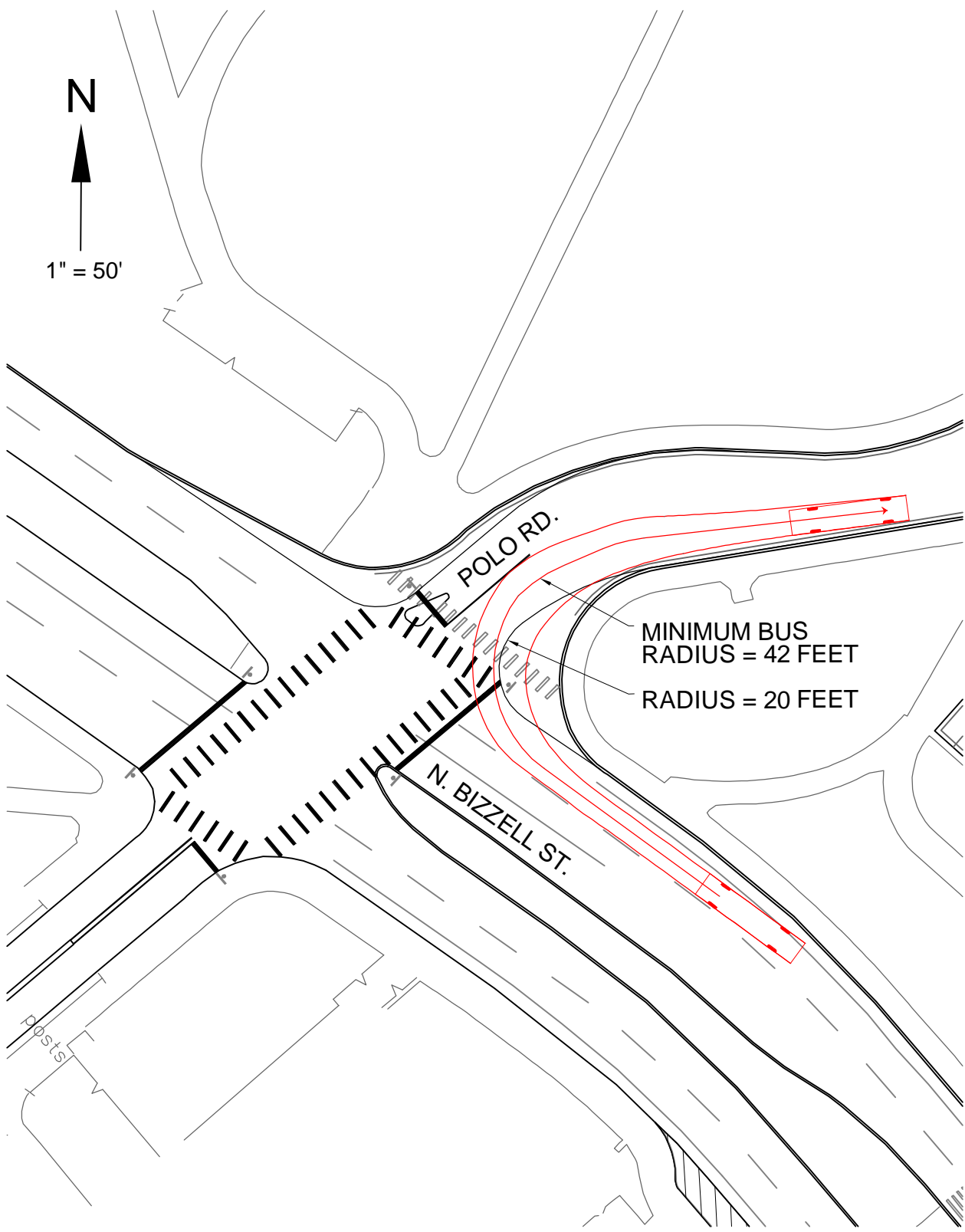


EXHIBIT 5  
AUTOTURN SIMULATION (40' BUS) WITH SHORTENED CURB RETURN RADIUS  
N. BIZZELL STREET AT POLO ROAD





**ELECTROTECHNICS CORPORATION**  
**1310 COMMERCE ST. MARSHALL, TX 75672**

**(903) 938-1901**

**(800) 227-1734 FAX (903) 938-1977**

**TO: Kimley-Horn and Associates**

**Date: 08/03/11**

**Quote NO: 080311-05WM**

Email: [brian.shamburger@kimley-horn.com](mailto:brian.shamburger@kimley-horn.com)

**Re: College Station Ped Xing Passive Detection**

**ATTN: Brian Shamburger**

**F.O.B. : Marshall TX**

**Proposed Ship Date: 30 Day ARO**

**TERMS: Net 30 Days**

**HERE IS OUR QUOTATION ON THE DESCRIBED PROJECT, SUBJECT TO THE CONDITIONS NOTED:**  
 CONDITIONS: the prices and terms of this quotation are not subject to verbal changes or other agreements unless approved in writing by the home office of the seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and all other causes beyond our control. Prices are based on costs and conditions existing on the date of the quotation and are subject to change by the seller before final acceptance. Typographical and stenographic errors are subject to corrections. Purchaser agrees to accept either overage or shortage not in excess of ten percent, to be charged for pro-rata. Purchaser assumes liability for patent copyright infringement when goods are manufactured to purchaser's specifications. When quotation specifies material to be furnished by purchaser, ample allowance must be made for reasonable spoilage and material must be of suitable quality to facilitate efficient production. Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein which might appear on the purchasers formal order would not be binding on the seller.

QUANTITY	DESCRIPTION	PRICE
2	Solar powered pedestrian crossing systems using 5 light RRFB light bar with passive activation system	\$5,848.00 EA
	System includes 1 2-compartment cabinet with Eltec FS2 Flasher, Prostar 15 controller, back panel and associated Wiring, 1 135-watt solar panel with side of pole mouting Rack, 2 100-ampere hour AGM batteries, 1 radio Receiver and 1 radio transmitter with antennas, 1 count Down timer, 1 Eltec wrap around 5 RRFB light bar with 5 RRFB lights, 1 MS Sedco passive pedestrian detector, 1 schedule 40 aluminum pole assembly with 4" x 16' Pole, breakaway base, anchor bolts, and pole collar, 2 Sets of pedestrian signs W11-2 (36" x 36") and W16-7 (24" x 12"), and 1 ADA compliant pedestrian pushbutton	

COMMENTS: \_\_\_\_\_

QUOTE VALID FOR 30 DAYS

BY Bill Marshall

*THANK YOU FOR ALLOWING ELTEC TO QUOTE THIS EQUIPMENT!*