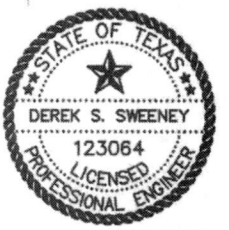
Binkley & Barfield | DCCM

Date: December 2, 2022

To: Princeton Independent School District

From: Derek Sweeney, PE, PTOE

Subject: Mattei Middle School & James Elementary School – School Zone Study



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INTRODUCTION

Pogue Construction retained the services of Binkley & Barfield | DCCM to evaluate the traffic signs and markings for new school zones at the new Mattei Middle School and James Elementary School campus in Princeton, Texas. The new campus is located on the north and west sides of CR 728 of FM 982 between CR 392 and Melody Lane. The *Texas Manual on Uniform Traffic Control* Devices (*TxMUTCD*) provides guidance on the evaluation of school zone traffic control devices.

STUDY AREA TRAFFIC CONDITIONS

There will be three access points on the east/west segment of CR 728. The western two will solely service James Elementary while the third will serve both schools. There will be one access point for Mattei Middle School located on the north/south segment of CR 728. CR 728 is a two-lane undivided roadway and has a speed limit of 40 miles per hour. The surrounding area around the school mostly agricultural and residential.

TRAFFIC CONTROL FOR SCHOOL AREAS

CR 728 turns 90 degrees at the southeast corner of the school. Given the separation between the driveways on the north/south and the east/west segments, two school zones are proposed to increase driver compliance to the reduced speed limits. Research shows that vehicle speeds tend to increase 1 mph for every 500 ft. of school zone they drive through.

The east/west zone is about 1,360 ft long while the north/south zone is about 735 ft in length. When you include the 665 ft gap between them, the total length is roughly 2,760 ft. At 40 mph, that would take a driver 47 seconds to drive through. At 20 mph, that would take 94 seconds which feels very long when driving 20 mph and not seeing any real school activity. If we split the two zones as proposed, it can reduce that travel time to 82 seconds which is more reasonable. While 12 seconds is not a long amount of time, the ability to speed up before the next zone will give drivers the impression they are traveling through the area with less delay which will help to maximize driver compliance with the reduced speed limits.

Listed below are the signs and markings that are recommended to be installed. The attached **School Zone Plan** shows the study area and the school zone traffic control devices discussed below. Recommendations are the result of the proposed location of the new school and are in accordance with the TxMUTCD. All distances are approximate and can be adjusted based on field conditions as needed.

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School Zone A (East/West Segment of CR 728)

- **CR 728 (Eastbound Direction)**
  - Install a school zone sign (S1-1) with a school sign plaque (S4-3P) 200 feet in advance of the proposed school zone speed limit assembly (approximately 400 feet west of the westernmost elementary school driveway). Note that this driveway has not yet been constructed and the exact location is not shown on the School Zone Plan.
  - Install a school zone speed limit assembly of 20 mph (S4-3P, R2-1-20MPH, S4-1P, S7-1T) (approximately 200 feet west of the westernmost elementary school driveway) with two flashing beacon signal heads mounted on the school zone speed limit assembly.
  - A transverse marking (12" white solid line) should be installed across CR 728 where the school speed zone begins and ends.
  - Install regulatory speed limit sign (R2-1) with an end school zone sign (S5-2) 450 feet east of the easternmost school driveway. The posted regulatory speed limit sign should display 40 mph.

- **CR 728 (Westbound Direction)**
  - Install a school zone sign (S1-1) with a school sign plaque (S4-3P) 200 feet in advance of the proposed school zone speed limit assembly (approximately 650 feet east of the easternmost school driveway).
  - Install a school zone speed limit assembly of 20 mph (S4-3P, R2-1-20MPH, S4-1P, S7-1T) (approximately 450 feet east of the easternmost school driveway) with two flashing beacon signal heads mounted on the school zone speed limit assembly.
  - A transverse marking (12" white solid line) should be installed across CR 728 where the school speed zone begins and ends.
  - Install regulatory speed limit sign (R2-1) with an end school zone sign (S5-2) 200 feet west of the westernmost school driveway. The posted regulatory speed limit sign should display 40 mph.

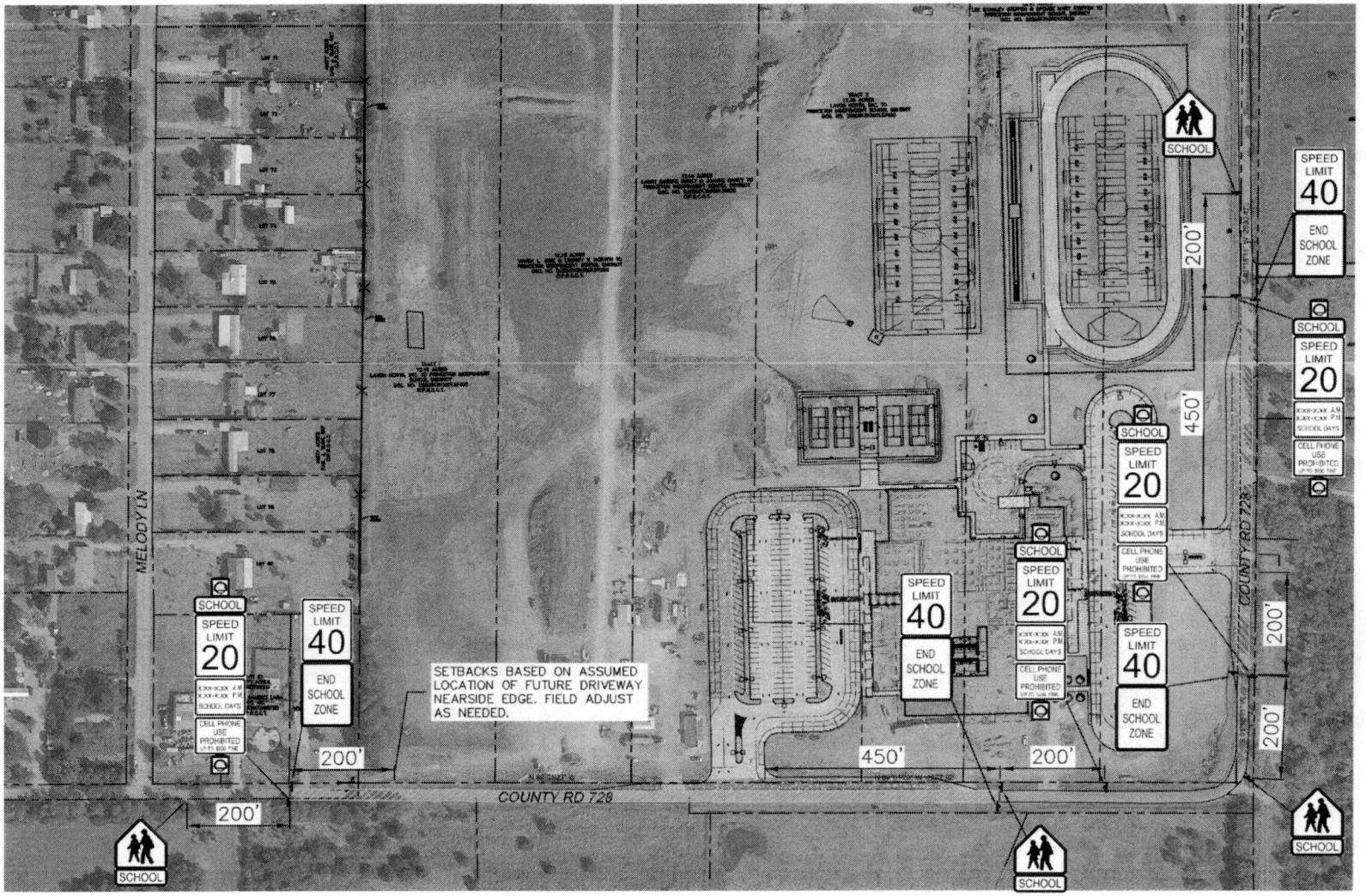
School Zone B (North/South Segment of CR 728)

- **CR 728 (Northbound Direction)**
  - Install a school zone sign (S1-1) with a school sign plaque (S4-3P) 200 feet in advance of the proposed school zone speed limit assembly (approximately 400 feet south of the school driveway).
  - Install a school zone speed limit assembly of 20 mph (S4-3P, R2-1-20MPH, S4-1P, S7-1T) (approximately 200 feet south of the school driveway) with two flashing beacon signal heads mounted on the school zone speed limit assembly.
  - A transverse marking (12" white solid line) should be installed across CR 728 where the school speed zone begins and ends.
  - Install regulatory speed limit sign (R2-1) with an end school zone sign (S5-2) 450 feet north of the school driveway. The posted regulatory speed limit sign should display 40 mph.

- **CR 728 (Southbound Direction)**
    - Install a school zone sign (S1-1) with a school sign plaque (S4-3P) 200 feet in advance of the proposed school zone speed limit assembly (approximately 650 feet north of the school driveway).
    - Install a school zone speed limit assembly of 20 mph (S4-3P, R2-1-20MPH, S4-1P, S7-1T) (approximately 450 feet north of the school driveway) with two flashing beacon signal heads mounted on the school zone speed limit assembly.
    - A transverse marking (12" white solid line) should be installed across CR 728 where the school speed zone begins and ends.
    - Install regulatory speed limit sign (R2-1) with an end school zone sign (S5-2) 200 feet south of the school driveway. The posted regulatory speed limit sign should display 40 mph.

The school zone speed limit assemblies are recommended to have S4-1P plaques with school times in addition to the flashing beacons. Using both beacons and times sign helps with enforcement on unsigned approaches where car enters midblock while also acting as a backup if the beacon malfunctions. The supplemental plaques for these school speed limit assemblies are recommended to show the school times in which the school speed zone is in effect. It is recommended the times be set as follows:

- Morning: Begin 45 minutes before school opens until classes begin
- Afternoon: For a 30-minute period beginning at the close of school



LEGEND

- SCHOOL SPEED ZONE
- 12" SOLID WHITE LINE
- SIGN
- FLASHING BEACON
- S4-3P (24x8)
- S4-1P
- S7-1T (24x18)
- S1-1 (36x36)
- R2-1-20MPH (24x30)
- R2-1-40MPH (24x30)
- S5-2 (24x18)

north

0 50' 100' 200'

SCALE: 1" = 200'

MATTEI MIDDLE SCHOOL & JAMES ELEMENTARY SCHOOL SCHOOL ZONE PLAN			
SCALE:	N/A	DATE:	DECEMBER 2022
JOB NO.:	2200000398	DWG. FILE:	TMP

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