



Madison Heights Bypass

Don French

District Materials Engineer

Lynchburg District

Background Information

Lynchburg

Located in Central Virginia



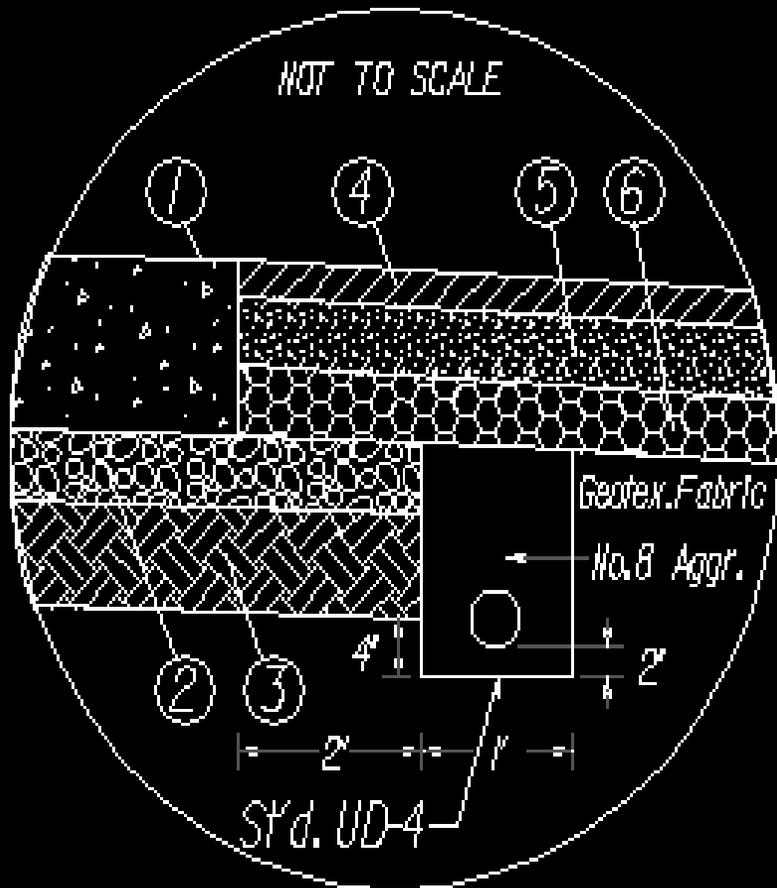
Rte 29 through Madison Heights in Amherst Co was stressed due to traffic.



- ESAL Loading in excess of 50 million.
- Resilient Modulus – 3500psi
- PCC Modulus of Rupture – 650 psi.
- Elastic Modulus of Slab – 3.7 million.
- k values ranging from 100 to 130 psi/in.
- Reliability of 90-95%

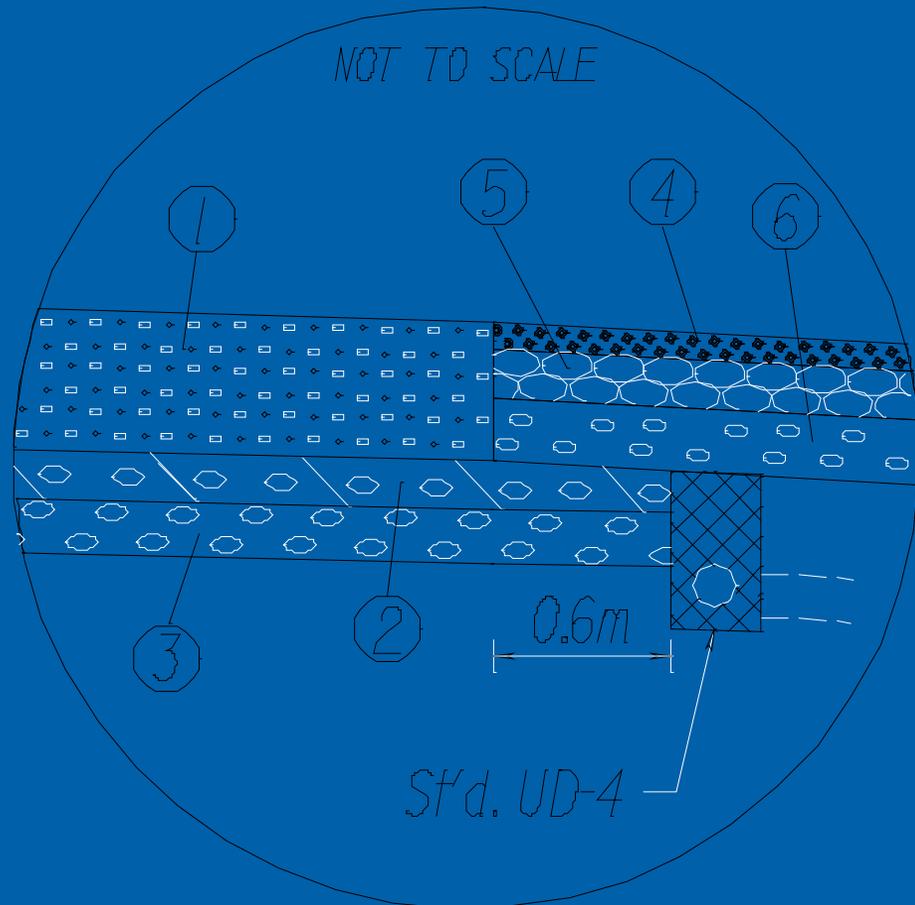
INSET A

NOT TO SCALE

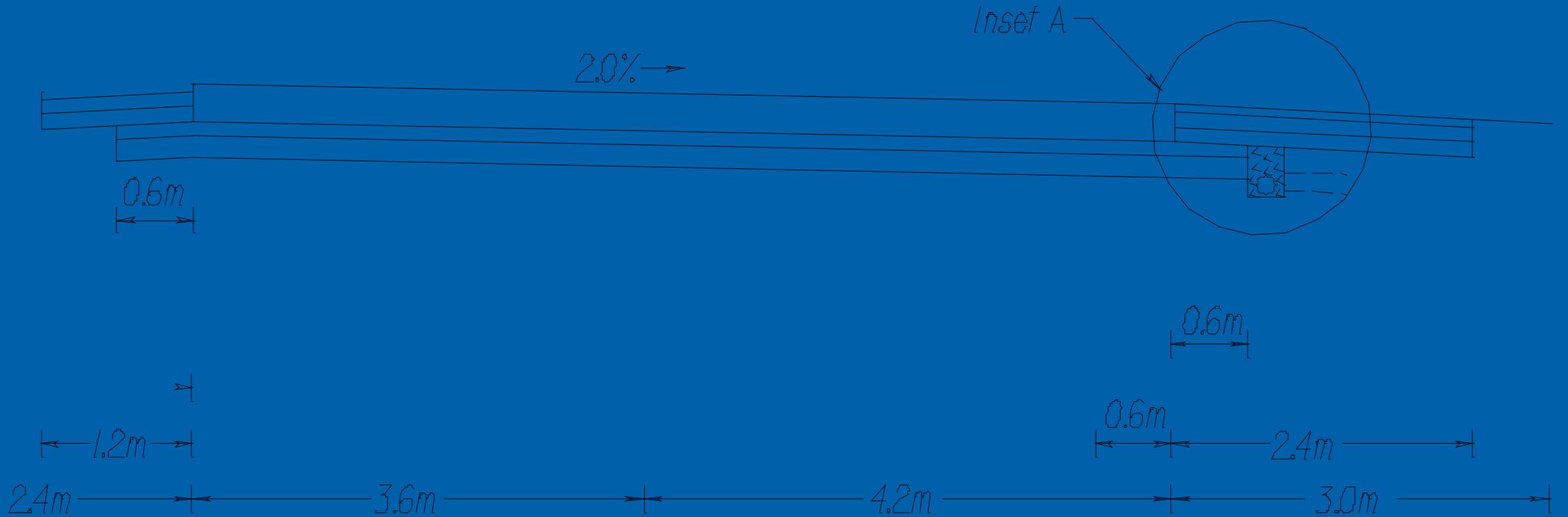


- ① 12" OF CONTINUOUSLY REINFORCED HYDRAULIC CEMENT CONCRETE PAVEMENT.
- ② 3" ASPHALT CONCRETE TYPE BM-25
- ③ STABILIZE TOP 8" OF SUBGRADE WITH 12% HYDRAULIC CEMENT BY VOLUME. COVER WITH 0.3 GAL/SY CRS-2L AND 20 LBS/SY NO. 8P AGGREGATE.
- ④ ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5D @ 220 LBS. PER SQ. YD.
- ⑤ 4" ASPHALT CONCRETE BASE COURSE TYPE BM-25
- ⑥ 8" CEMENT STAB. AGGREGATE BASE MATERIAL TYPE 1 No. 21A (4% HYDRAULIC CEMENT BY WEIGHT)

INSET A



- ① 300mm OF CONTINUOUSLY REINFORCED CONCRETE PAVEMENT.
- ② 75mm ASPHALT CONCRETE BASE COURSE TYPE BM-25 (@ 181 kg/m²)
- ③ STABILIZE TOP 200mm OF SUBGRADE WITH 12% HYDRAULIC CEMENT BY VOLUME. COVER WITH 1.3 LITRE/m² CRS-2L AND 11 kg/m² NO. 8P AGGREGATE.
- ④ ASPHALT CONCRETE SURFACE COURSE TYPE SM-12.5D @ 125 kg/m².
- ⑤ 100mm ASPHALT CONCRETE BASE COURSE TYPE BM-25
- ⑥ 150mm AGGREGATE BASE MATERIAL TYPE I No. 21A STABILIZE WITH 4% HYDRAULIC CEMENT BY WEIGHT.



- The Madison Heights Bypass was constructed in phases with nine separate contracts.
- The connectors and interchanges were built with a hot mix asphalt design.
- The mainline was constructed with a Continuously Reinforced Concrete Pavement

The Pleasant Valley Interchange



Monacan Bridge over the James River



Route 210 Connector



Route 130 Connector and 29 interchange



Sweet Briar Interchange







Construction!

A good riding concrete surface starts with the sub grade.



The soil cement was maintained within a half inch from plan elevation.



Laying Asphalt to grade proved to be challenging. The Asphalt contractors on both projects used Top Con systems so grade could be placed from a string line. The learning curve resulted in substantial areas in which the grade was not appropriate to construct on.



For the steel design we used #7 english or #22 metric longitudinal bars, spaced at $6\frac{3}{4}\pm\frac{3}{8}$ inches.

For the transverse bar we used a #5 english or a #16 metric, spaced at 48 ± 2 inches.

The southern project utilized the Hardy Chair-Lok system to set the steel at mid-depth.



The Northern Project utilized SMI's combination transverse bar/chair assembly (TBA).















The longitudinal joint was then sawed. This was completed normally within 12 hours.









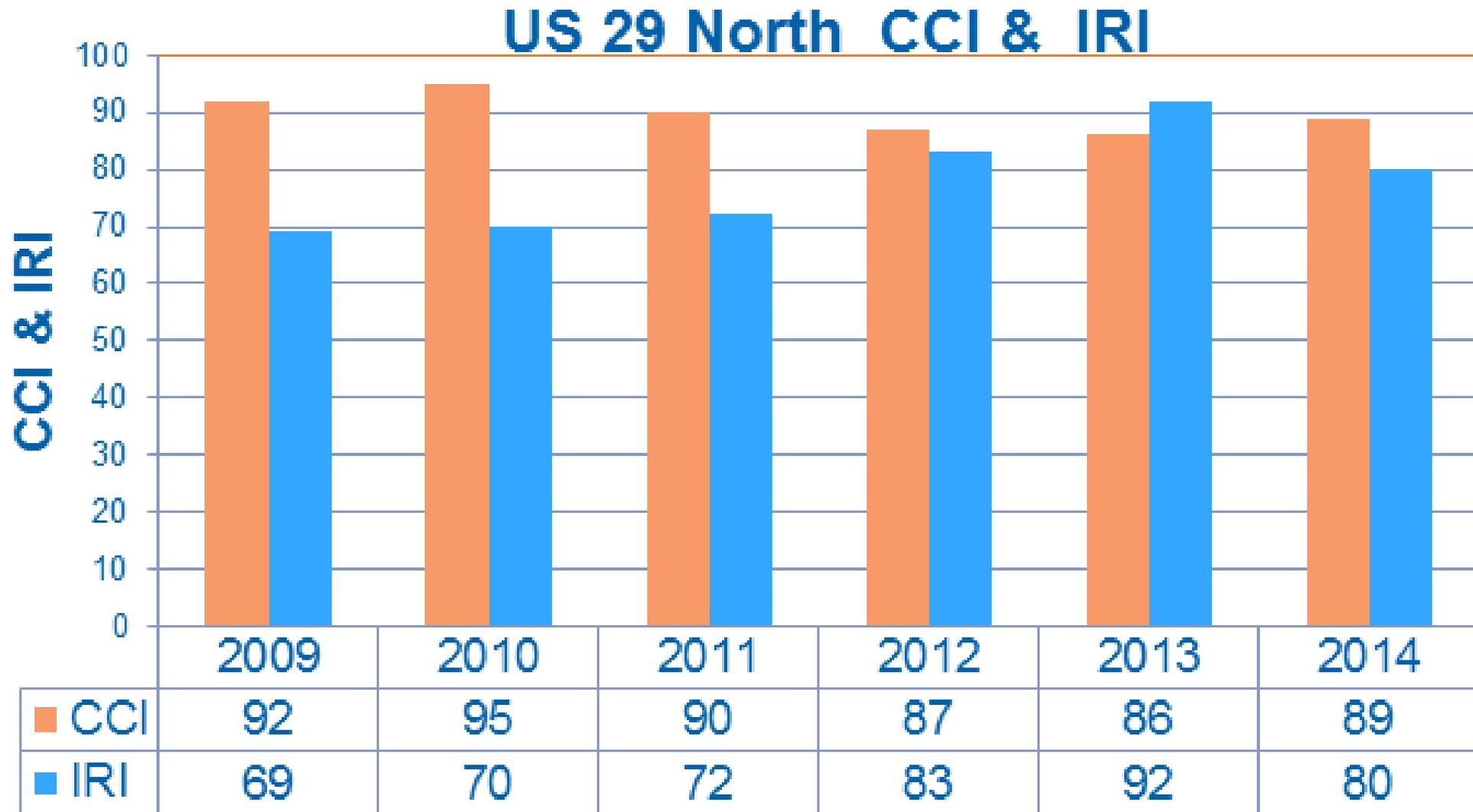
- Subgrade, subgrade, subgrade
- Parallel Planes
- Great Contractors
- No large stone OGD
- others

We placed a test pad exactly as the pavement would be built. This helped all parties work out the “bugs” before the paving operation began.



The finished product resulted in a average IRI of 50 to 60.





IRI Northbound AVE. 75-76

IRI Southbound AVE. 68-72



How is it holding up?















This is a project that all the groups involved
are proud of...

Prime Contractor for South Project

6029-005-F22,C501

Glade East,Inc.

Concrete Pavement

Glade East,Inc

Asphalt Sub-Contractor

Marvin V Templeton and Sons,Inc.

Soil Cement Sub-Contractor

Site Prep,Inc

Prime Contractor for North project
6029-005-F22,C502

English Construction Co., Inc.

Haymes Brothers, Inc.

Concrete Pavement

APAC, Inc.

Asphalt Sub-Contractor

Lawhorne Bros., Inc.

Soil Cement Sub-Contractor

Site Prep, Inc

Air Content	4.0% - 8.0%
Concrete Temp.	Min. 40°F Max. 90°F
Slump	Max. 3 inch
Compressive Strength	4000 psi
Flexural Strength	Min 650 psi
w/c Ratio	Max. 0.49
Cementitious Material Content	Min. 565 lb/yd ²

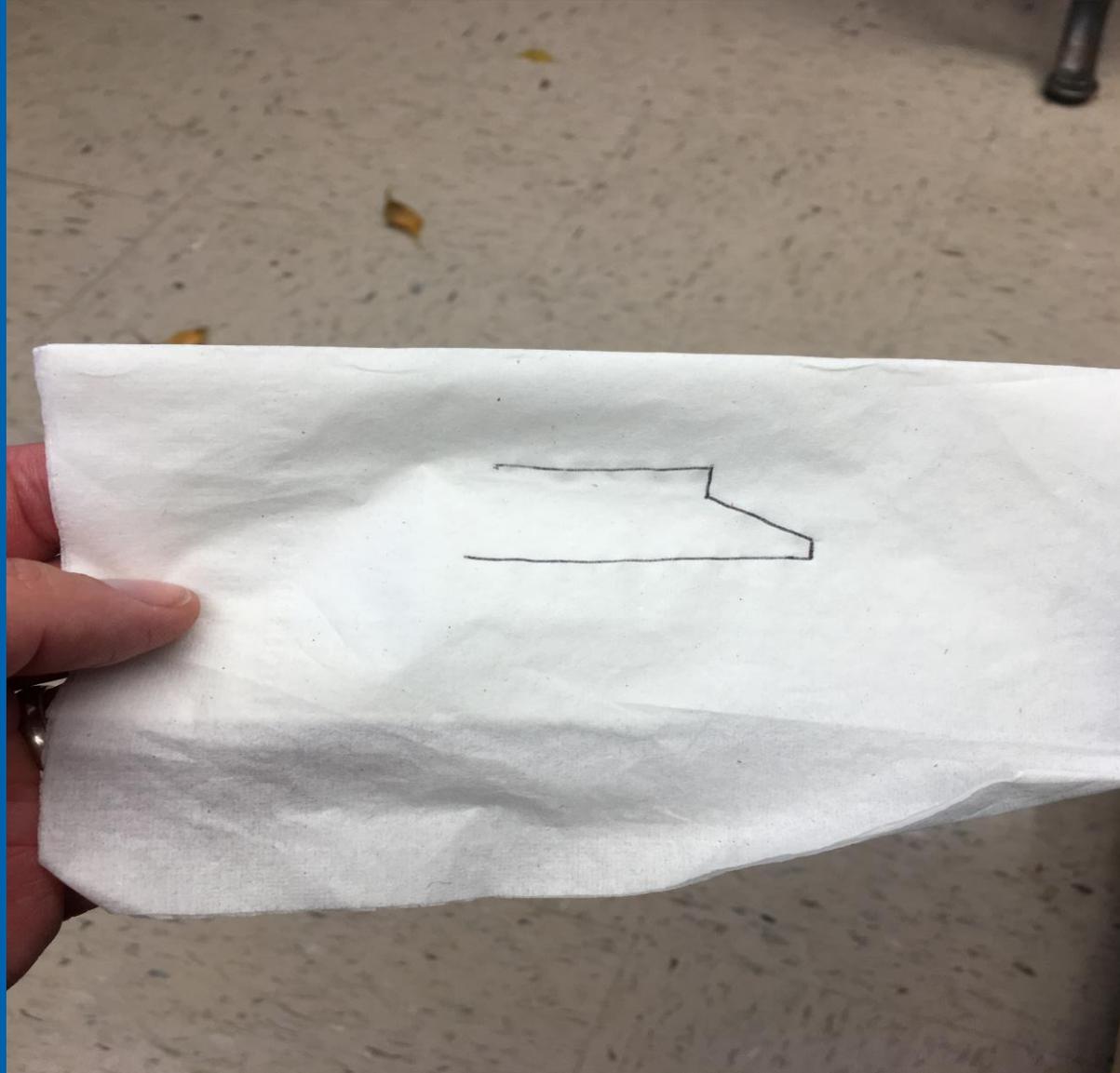












The End