

Appendix K

**NOTE: Appendix Information is for Reference Only.
Contact Local Entity Engineer for Current Information.**

Loveland Pavement Markings Layout Standards
(City of Loveland only)

PAVEMENT MARKINGS LAYOUT STANDARDS



*City of Loveland
Traffic Operations*

Shared Left Turn
(Suicide) Lanes
Longer than 94'

1) Shared Left Turn (Suicide) Lanes are used by vehicles to make Left turns from opposite flows of traffic.

2) Refer to the diagrams for understanding steps that follow.

3) If measurements from point A to B are longer than 94' the 12' Arrows are placed 25' out from the center of the lane.

4) Using the measuring wheel measure how long the lane is from A to B. Find the center on both sides of the lane using the measuring wheel and mark with chalk. *diagram #1*

5) Starting with the 12' Arrow in front of the thermo truck, from the center marks measure out 25' on both sides of the lane and mark with chalk. *diagram #1*

6) From those 25' marks measure out 12' on both sides of the lane and mark with chalk. *diagram #1*

6) Blow off the 12' area (*where the Arrow will be placed*) you'll be working in with the leaf blower. This gets all the dirt and rocks off the surface before layout and burning.

7) Using the 25' chalk marks measure across the lane (*inside of solid yellow lines*), and mark the center with a vertical and horizontal chalk mark. (*This is where the #2 top thermo piece goes*) *diagram #1*

8) Using the 12' chalk marks measure across the lane (*inside of solid yellow lines*), and mark the center with a vertical and horizontal chalk mark.

9) At that center point measure 18" over and make a horizontal and vertical chalk mark. The bottom of the Arrow is offset. (*this is where the #6 bottom thermo piece goes*) refer to *diagrams #2 or #3*

10) Now the 12' Arrow thermo pieces can be laid down. *diagrams #2 or #3*

11) When lined up properly burn to the pavement. While thermo is still hot spread reflective glass beads down. Doing a section at a time.

12) Repeat the above steps for the other 12' Arrow behind the thermo truck. Pay close attention to where the 18" offset is for the bottom of the arrow.

diagram #1

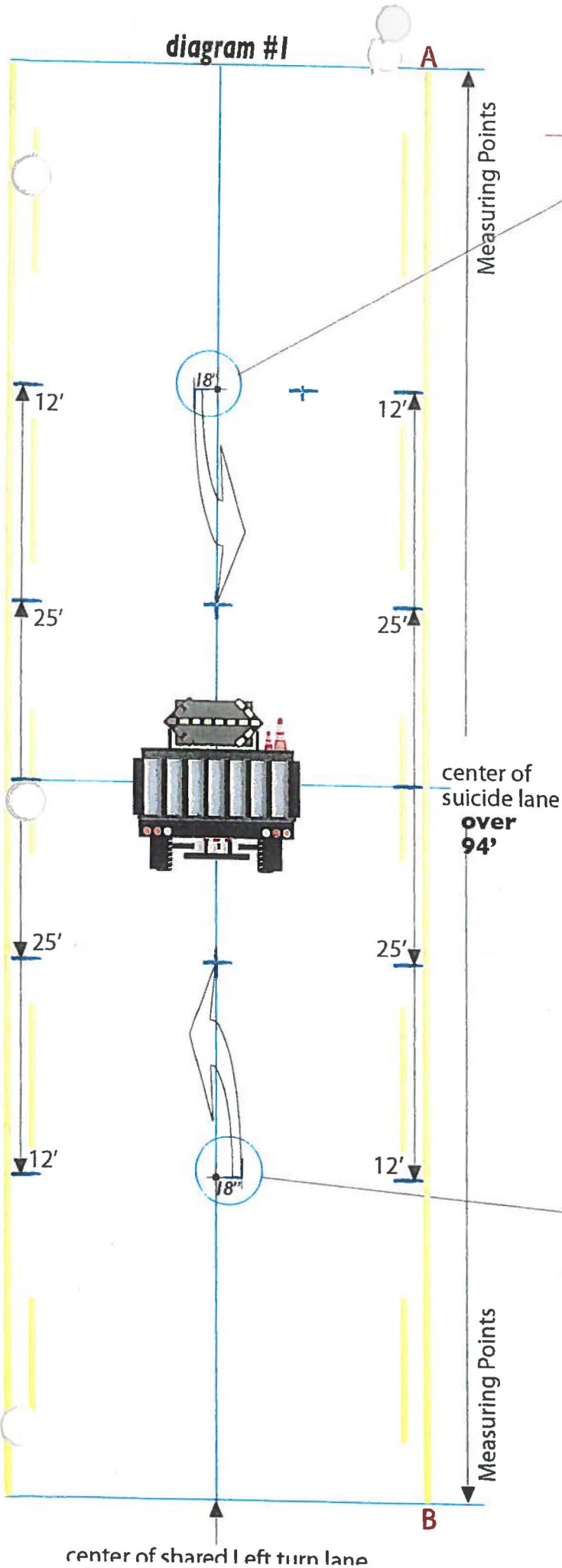
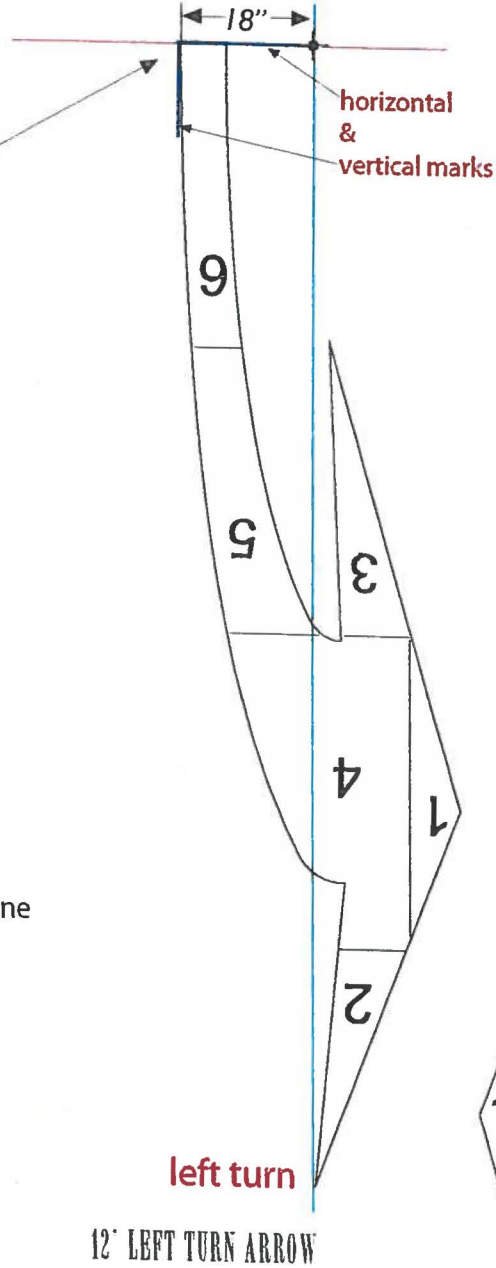
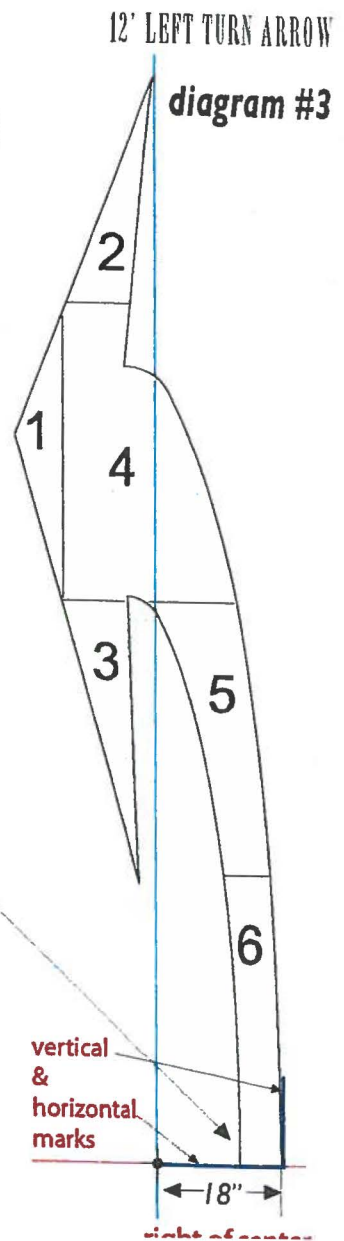


diagram #2



Shared Left Turn
(Suicide) Lanes
Longer than 94'

diagram #3





Public Works Department
Traffic Engineering & Operations
Maintenance & Operations Center



Over 80' RIGHT turnbay

When the Turn Bay is over 80' lay (2) 12' Rev. Turn Arrows and (1) ONLY.

Refer to the diagrams for understanding steps that follow.

If measurements from point A to B (8" white turn line) are over 80' the 12' Arrows are placed 10' in from the ends of the lane and the ONLY in the center.

When doing layout for RIGHT turnbay, all measurements, marks and chalk lines are done on the paved road. Not on the concrete pan at the edge of the lane next to the curb. diagram #1

Using the measuring wheel measure how long the lane is from A to B with the 8" white turn line as a guide. Find the center on both sides of the lane using the measuring wheel and mark with chalk. *diagram #1*

12' Rev. Turn Arrow

Starting with the 12' Arrow at the top of the Turnbay lane in front of the thermo truck, on both sides of the lane measure in 10', mark with chalk on both sides. Then measure in 12' on both sides of the lane starting from the 10' marks and mark with chalk. *diagram #1*

Blow off the 12' area (where the Arrow will be placed) you'll be working in with the leaf blower. This gets all the dirt and rocks off the surface before layout and burning.

Using the 10' chalk marks measure across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan) and mark the center with a vertical chalk mark. (this is where the top, #2 thermo piece should line up to) *diagram #1 & #2*

Using the 12' chalk marks snap a chalk line across the lane.

Measure across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan) and mark the center with a small chalk mark.

At that center point measure 18" over to the Left and make a horizontal and vertical chalk mark. The bottom of the Arrow is offset. (this is where the #6 bottom thermo piece goes) *diagrams #1 & #2*

Lay down the 12' Arrow thermo pieces, line up straight & burn to the pavement. *diagrams #1 & #2*

Note: When doing a RIGHT turnbay flip the Premark thermo pieces on the other side. This will make the Arrow point in the RIGHT direction.

As a section of the Arrows have been burned to the pavement, while still hot spread some reflective glass beads down. Continue this process for the entire Arrow.

Move the thermo truck back toward the bottom of the turn lane and repeat the above steps for the bottom 12' Arrow.

The only change is the bottom of the 12' Arrow is laid out on the 10' line across the lane. This is where the 18" offset is laid out,

ONLY

The (2) 12' Arrows are done. Now time for the layout of the ONLY.

Move the thermo truck up past the center marks of the Left turnbay lane.

The chalk marks at the center of the Turnbay lane have already been marked. This is the starting point for the ONLY layout.

Using the 2 center chalk marks measure down 49" & up 49" (8'2"). Mark with chalk on both sides of the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan).

Blow off the 8' area (where the ONLY will be placed).

Using the 49" chalk marks on both sides of the lane snap 2 horizontal chalk lines across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan) Mark the center on both chalk lines.

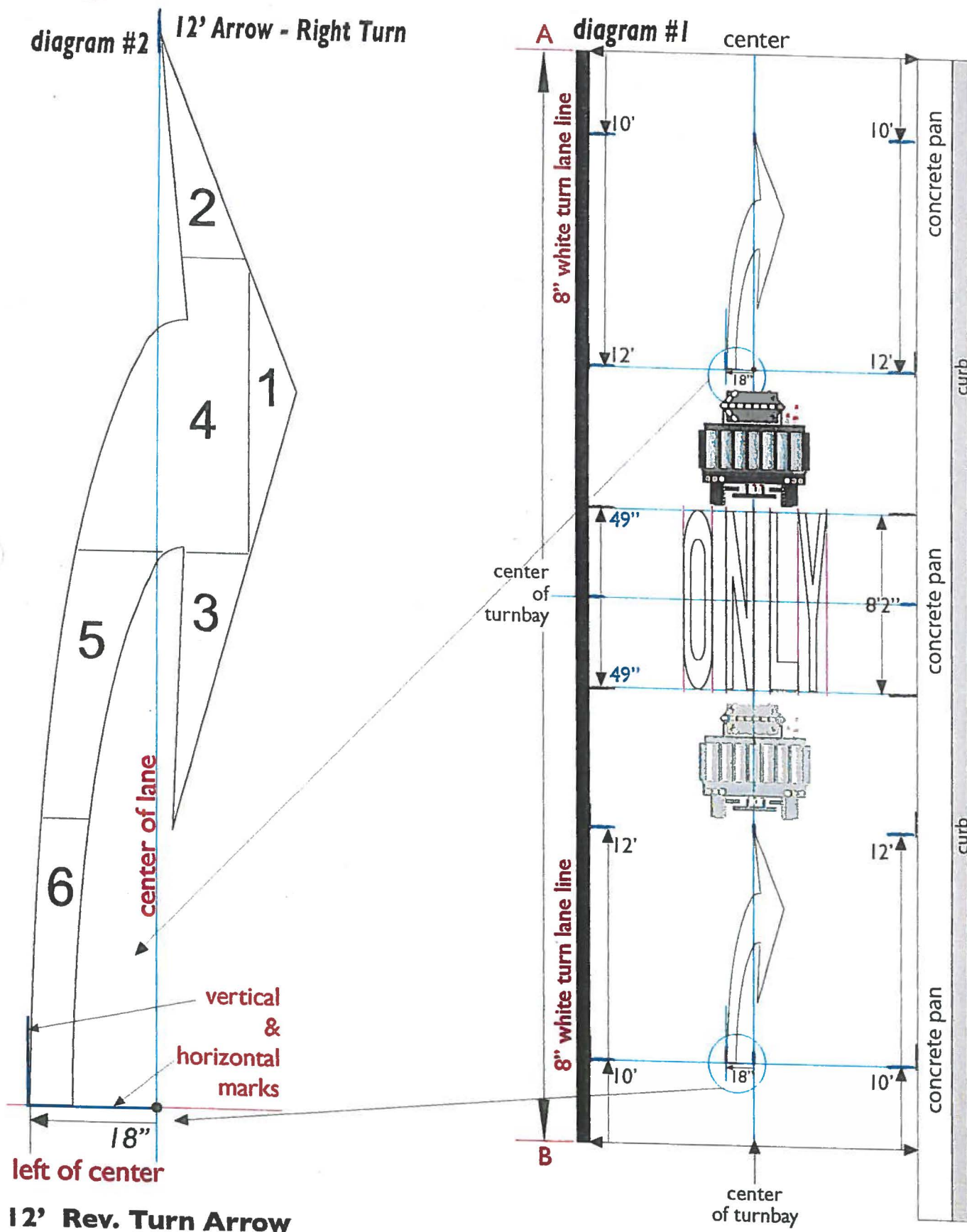
On both chalk lines from the center do the layout as seen on the Premark ONLY insert or *diagram 3* marking the 16" & 8" increments with chalk.

Snap vertical chalk lines using all the 16" & 8" increments marks. The ONLY thermo letters will fit inside these spaces. *diagram 3*

When lined up properly burn to the pavement.

As a section of the letters have been burned to the pavement, while still hot spread some reflective glass beads down.

Continue this process for all the ONLY letters.





Public Works Department
Traffic Engineering & Operations
Maintenance & Operations Center



Over 80' LEFT turnbay

When the Turn Bay is over 80' lay (2) 12' Rev. Turn Arrows and (1) ONLY.

Refer to the diagrams for understanding steps that follow.

If measurements from point A to B (8" white turn line) are over 80' the 12' Arrows are placed 10' in from the ends of the lane and the ONLY in the center.

Using the measuring wheel measure how long the lane is from A to B with the 8" white turn line as a guide. Find the center on both sides of the lane using the measuring wheel and mark with chalk. *diagram #1*

12' Rev. Turn Arrow

Starting with the 12' Arrow at the top of the Turnbay lane in front of the thermo truck, on both sides of the lane measure in 10', mark with chalk on both sides. Then measure in 12' on both sides of the lane starting from the 10' marks and mark with chalk. *diagram #1*

Blow off the 12' area (where the Arrow will be placed) you'll be working in with the leaf blower. This gets all the dirt and rocks off the surface before layout and burning.

Using the 10' chalk marks measure across the lane (inside of solid yellow line & 8" white turn line) and mark the center with a vertical chalk mark. (where the top, #2 thermo piece should line up to) *diagram #1 & #2*

Using the 12' chalk marks snap a chalk line across the lane.

Measure across the lane (inside of solid yellow lines & 8" white turn line) and mark the center with a small chalk mark.

At that center point measure 18" over to the right and make a horizontal and vertical chalk mark. The bottom of the Arrow is offset. (this is where the #6 bottom thermo piece goes) *diagrams #1 & #2*

Lay down the 12' Arrow thermo pieces, line up straight & burn to the pavement. *diagrams #1 & #2*

As a section of the Arrows have been burned to the pavement, while still hot spread some reflective glass beads down. Continue this process for the entire Arrow.

Move the thermo truck back toward the bottom of the turn lane and repeat the above steps for the bottom 12' Arrow.

The only change is the bottom of the 12' Arrow is layed out on the 10' line across the lane. This is where the 18" offset is layed out, where the #6 thermo piece goes. *diagram #1 & #2*

ONLY

The (2) 12' Arrows are done. Now time for the layout of the ONLY.

Move the thermo truck up past the center marks of the Left turnbay lane.

The chalk marks at the center of the Turnbay lane have already been marked. This is the starting point for the ONLY layout.

Using the 2 center chalk marks measure down 49" & up 49" (8'2"). Mark with chalk on both sides of the lane (inside of solid yellow lines & 8" white turn line).

Blow off the 8' area (where the ONLY will be placed).

Using the 49" chalk marks on both sides of the lane snap 2 horizontal chalk lines across the lane (inside of solid yellow lines & 8" white turn line) Mark the center on both chalk lines.

On both chalk lines from the center do the layout as seen on the Premark ONLY insert or *diagram 3* marking the 16" & 8" increments with chalk.

Snap vertical chalk lines using all the 16" & 8" increments marks. The ONLY thermo letters will fit inside these spaces. *diagram 3*

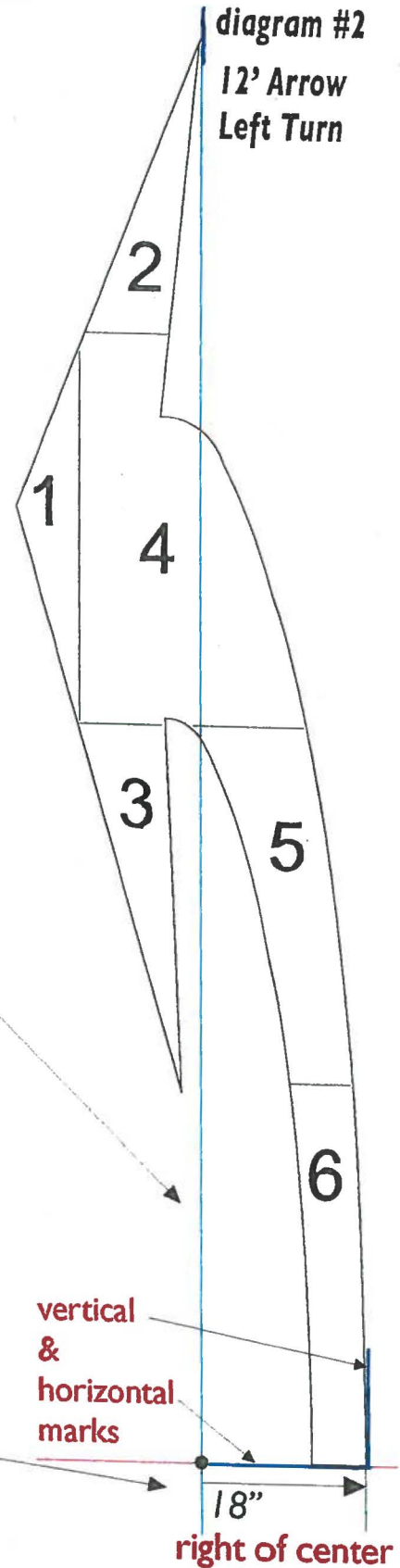
When lined up properly burn to the pavement.

As a section of the letters have been burned to the pavement, while still hot spread some reflective glass beads down. Continue this process for all the ONLY letters.

diagram #1



**12' Arrow
Left Turn**



12' Rev. Turn Arrow



50' - 80' RIGHT turnbay

When the Turn Bay is from 50' - 80' lay (1) 12' Rev. Turn Arrow and (1) ONLY.

Refer to the diagrams for understanding steps that follow.

Use the measuring wheel.

If measurements from point A to B (8" white turn line) are from 50' - 80' the 12' Arrow is placed 10' in from the top end of the turnbay lane and the ONLY is placed 10' in from the bottom of the turnbay lane.

When doing layout for RIGHT turnbay, all measurements, marks and chalk lines are done on the paved road. Not on the concrete pan at the edge of the lane next to the curb.

12' Rev. Turn Arrow

Starting with the 12' Arrow at the top of the Turnbay lane in front of the thermo truck, on both sides of the lane measure in 10', mark with chalk on both sides. Then measure in 12' on both sides of the lane starting from the 10' marks and mark with chalk. *diagram #1*

Blow off the 12' area (where the Arrow will be placed) you'll be working in with the leaf blower. This gets all the dirt and rocks off the surface before layout and burning.

Using the 10' chalk marks measure across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan) and mark the center with a vertical chalk mark. (this is where the top, #2 thermo piece should line up to) *diagram #1*

Using the 12' chalk marks snap a chalk line across the lane.

Measure across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan) and mark the center with a small chalk mark.

At that center point measure 18" over to the Left and make a horizontal and vertical chalk mark. The bottom of the Arrow is offset. (this is where the #6 bottom thermo piece goes) *diagrams #1 & #2*

Lay down the 12' Arrow thermo pieces, line up straight & burn to the pavement. *diagrams #1 & #2*

Note: When doing a RIGHT turnbay flip the Premark thermo pieces on the other side. This will make the Arrow point in the RIGHT direction.

As a section of the Arrows have been burned to the pavement, while still hot spread some reflective glass beads down.
Continue this process for the entire Arrow.

ONLY

The (1) 12' Arrow is done. Now time for the layout of the ONLY.

Move the thermo truck back towards the bottom of the Left turnbay lane. *diagram #1*

From the bottom of the turnbay lane measure in, first 10' and then 8' 2" and mark with chalk on both sides of the lane. *diagram #1*

Blow off the 8' area (where the ONLY will be placed).

Using the 10' and 8' 2" chalk marks on both sides of the lane snap 2 horizontal chalk lines across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan). *diagram #1*

Measure across the lane (inside of the 8" white turn line and the edge of the pavement, not the concrete pan) on both the snapped chalked lines and mark the center with a small vertical chalk mark. *diagram #1*

On both chalk lines from the center do the layout as seen on the Premark ONLY insert or *diagram 3* marking the 16" & 8" increments with chalk.

Snap vertical chalk lines using all the 16" & 8" increments marks. The ONLY thermo letters will fit inside these spaces. *diagram 3*

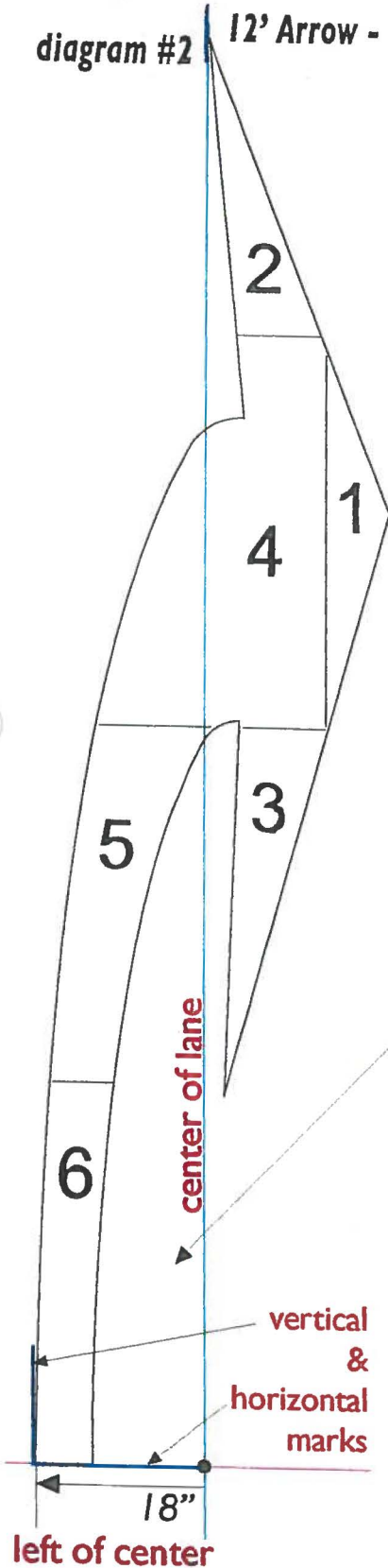
When lined up properly burn to the pavement.

As a section of the letters have been burned to the pavement, while still hot spread some reflective glass beads down.
Continue this process for all the ONLY letters.



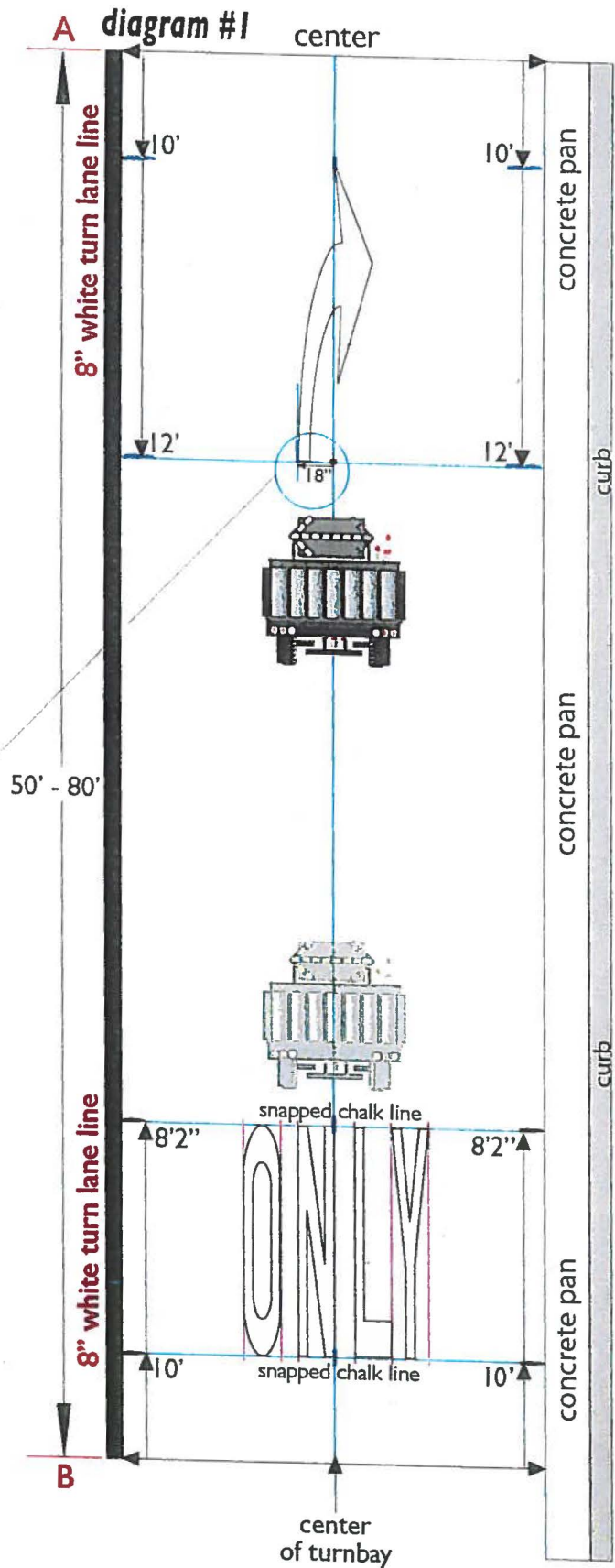
50' - 80' RIGHT turnbay layout

diagram #2 12' Arrow - Right Turn



12' Rev. Turn Arrow

diagram #1





50' - 80' LEFT turnbay

When the Turn Bay is from 50' - 80' lay (1) 12' Rev. Turn Arrow and (1) ONLY.

Refer to the diagrams for understanding steps that follow.

Use the measuring wheel.

If measurements from point A to B (8" white turn line) are from 50' - 80' the 12' Arrow is placed 10' in from the top end of the turnbay lane and the ONLY is placed 10' in from the bottom of the turnbay lane.

12' Rev. Turn Arrow

Starting with the 12' Arrow at the top of the Turnbay lane in front of the thermo truck, on both sides of the lane measure in 10', mark with chalk on both sides. Then measure in 12' on both sides of the lane starting from the 10' marks and mark with chalk. *diagram #1*

Blow off the 12' area (where the Arrow will be placed) you'll be working in with the leaf blower. This gets all the dirt and rocks off the surface before layout and burning.

Using the 10' chalk marks measure across the lane (inside of solid yellow lines & 8" white turn line) and mark the center with a vertical chalk mark. (this is where the top, #2 thermo piece should line up to) *diagram #1 & #2*

Using the 12' chalk marks snap a chalk line across the lane.

Measure across the lane (inside of solid yellow lines & 8" white turn line) and mark the center with a small chalk mark.

At that center point measure 18" over to the right and make a horizontal and vertical chalk mark. The bottom of the Arrow is offset. (this is where the #6 bottom thermo piece goes) *diagrams #1 & #2*

Lay down the 12' Arrow thermo pieces, line up straight & burn to the pavement. *diagrams #1 & #2*

As a section of the Arrows have been burned to the pavement, while still hot spread some reflective glass beads down. Continue this process for the entire Arrow.

Move the thermo truck back toward the bottom of the turn lane and prepare to layout the ONLY.

ONLY

The (1) 12' Arrow is done. Now time for the layout of the ONLY.

Move the thermo truck back towards the bottom of the Left turnbay lane. *diagram #1*

From the bottom of the turnbay lane measure in, first 10' and then 8' 2" and mark with chalk on both sides of the lane. *diagram #1*

Blow off the 8' area (where the ONLY will be placed).

Using the 10' and 8' 2" chalk marks on both sides of the lane snap 2 horizontal chalk lines across the lane (inside of solid yellow lines & 8" white turn line). *diagram #1*

Measure across the lane (inside of solid yellow lines & 8" white turn line) on both the snapped chalked lines and mark the center with a small vertical chalk mark. *diagram #1*

On both chalk lines from the center do the layout as seen on the Premark ONLY insert or *diagram 3* marking the 16" & 8" increments with chalk.

Snap vertical chalk lines using all the 16" & 8" increments marks. The ONLY thermo letters will fit inside these spaces. *diagram 3*

When lined up properly burn to the pavement.

As a section of the letters have been burned to the pavement, while still hot spread some reflective glass beads down. Continue this process for all the ONLY letters.

50' - 80' LEFT turnbay layout

diagram #1

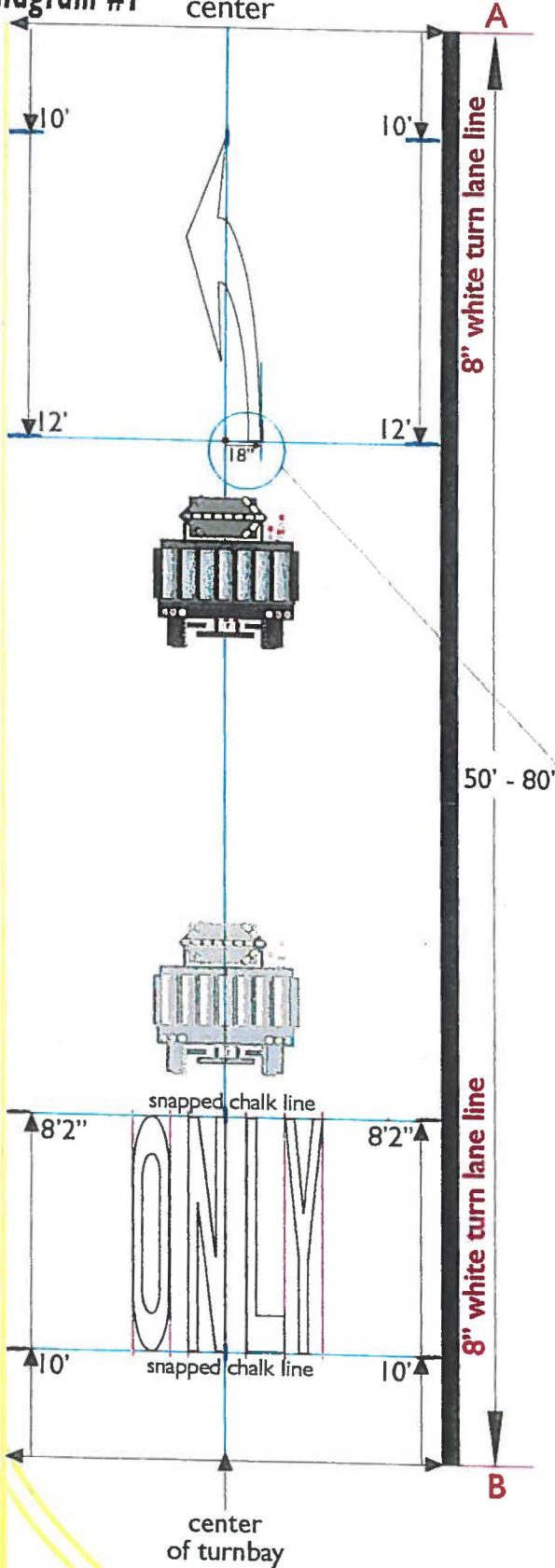
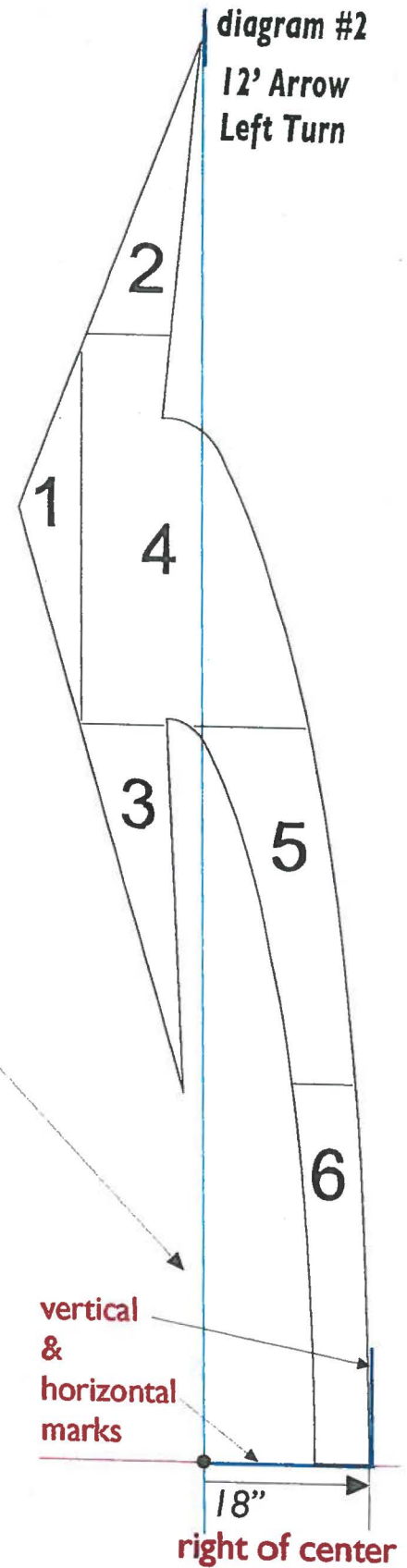


diagram #2

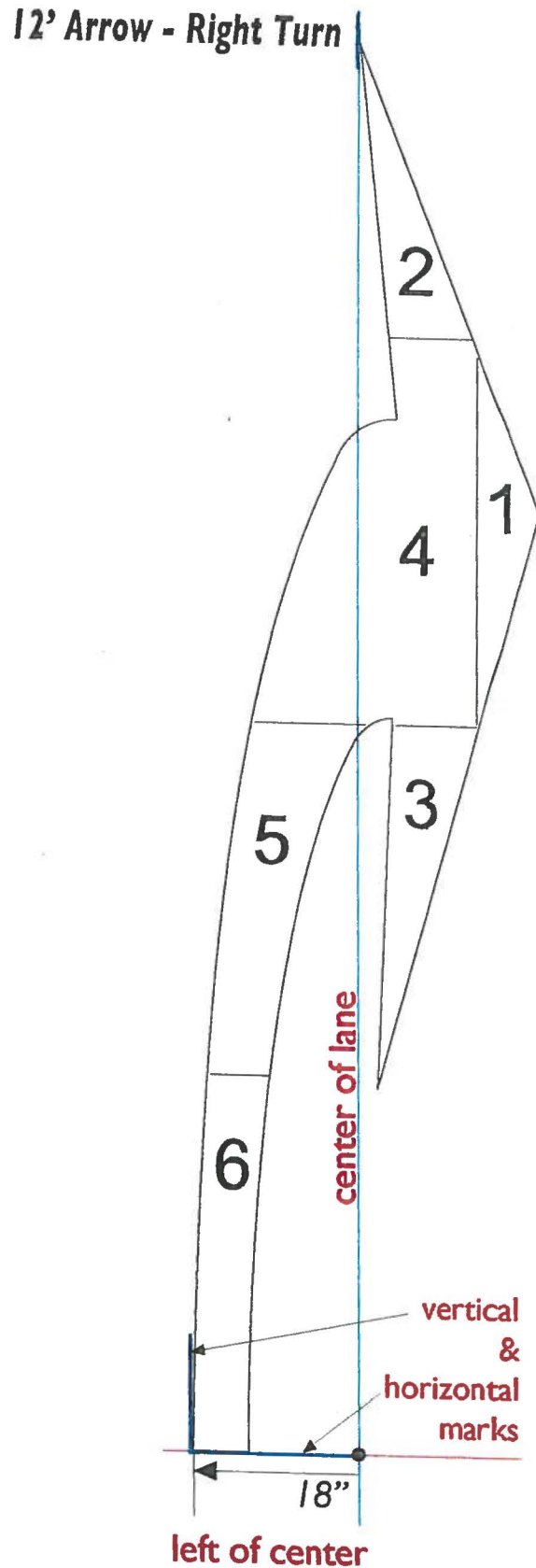
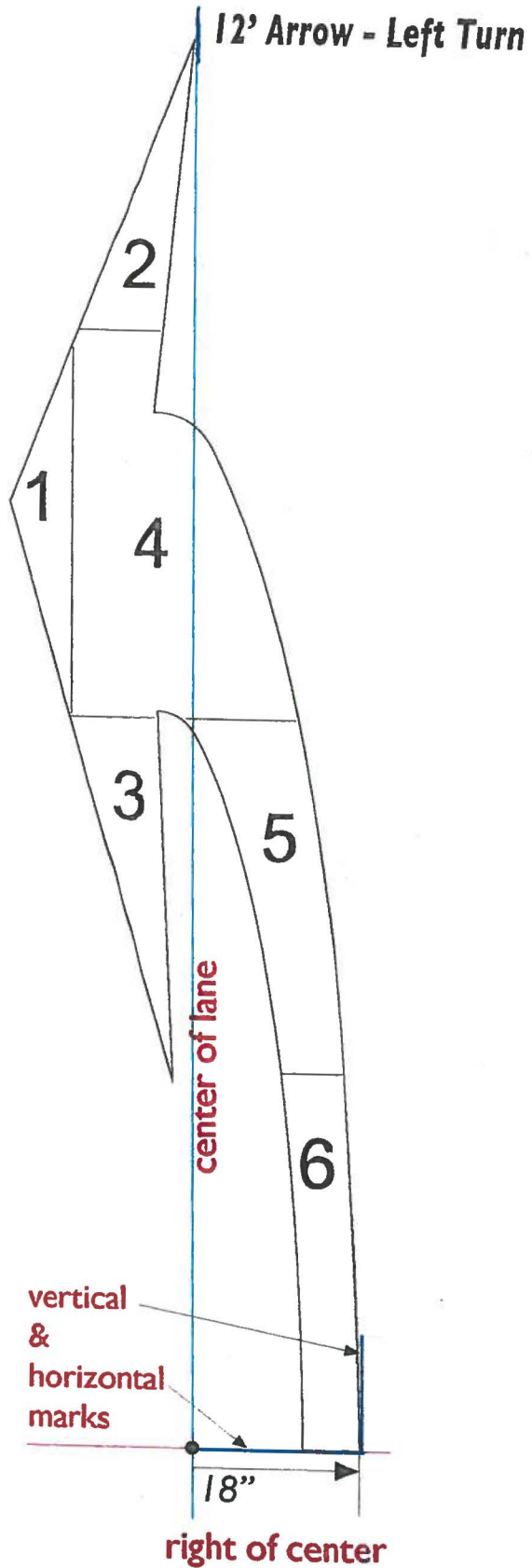
12' Arrow
Left Turn



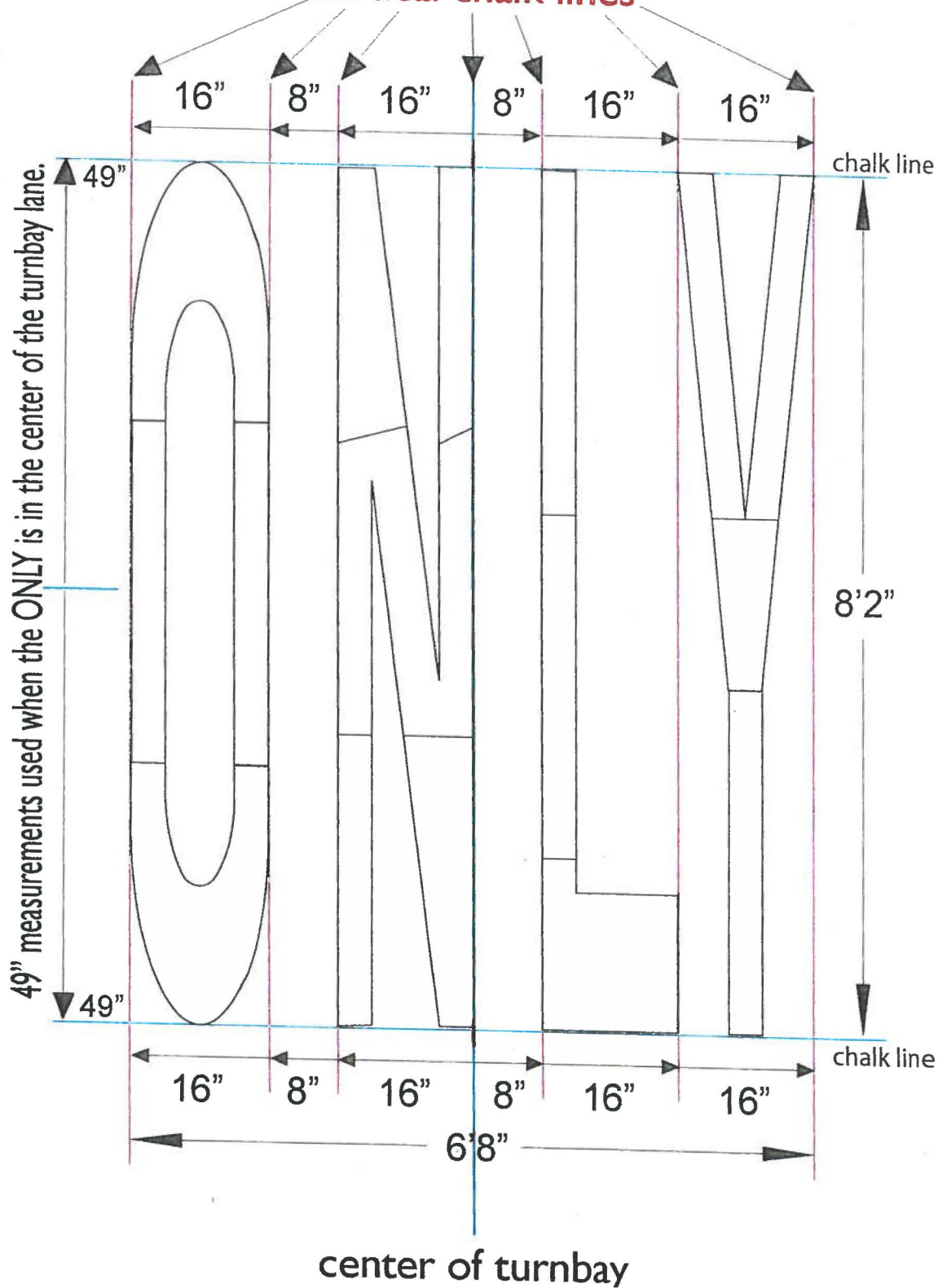
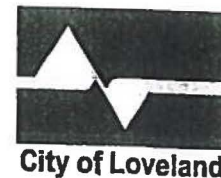
12' Rev. Turn Arrow



12' Rev. Turn Arrow



Note: When doing a RIGHT turn, fit the Demand Arrow into the Right Turn Arrow.



Bikers & 6' Arrow Layout

Refer to the illustration on this page as you read.

Layout for Biker symbol & 6' arrow are done **ONLY** on paved Asphalt or Chip Seal, NEVER on the concrete pan at the edge near the curb.

At the beginning end of the Bike Lane measure up 10' mark with chalk. Then measure up 4' and mark with chalk.

Measure across the Bike Lane at that 10' mark and mark with chalk the middle of the lane. (from inside the white line to inside the other white line or from inside the white line to the edge of the Asphalt).

From the 10' mark snap a chalk line across the Bike Lane, (this will be the bottom of the Biker Symbol).

From the middle of the lane mark measure 12" each way and mark vertical lines with chalk about 10".

From that same 10' mark again measure up 4' and mark with chalk just like the 10' chalk mark.

From the 4' mark measure across the lane and mark the middle with a vertical & horizontal line (+). (the horizontal line will be the top of the Biker symbol)

Now layout the thermo pieces as seen on the Premark Design sheet in the box. Use the head piece with the helmet.

When the thermo pieces are set now is time to burn the thermo to the Asphalt with the propane torch.

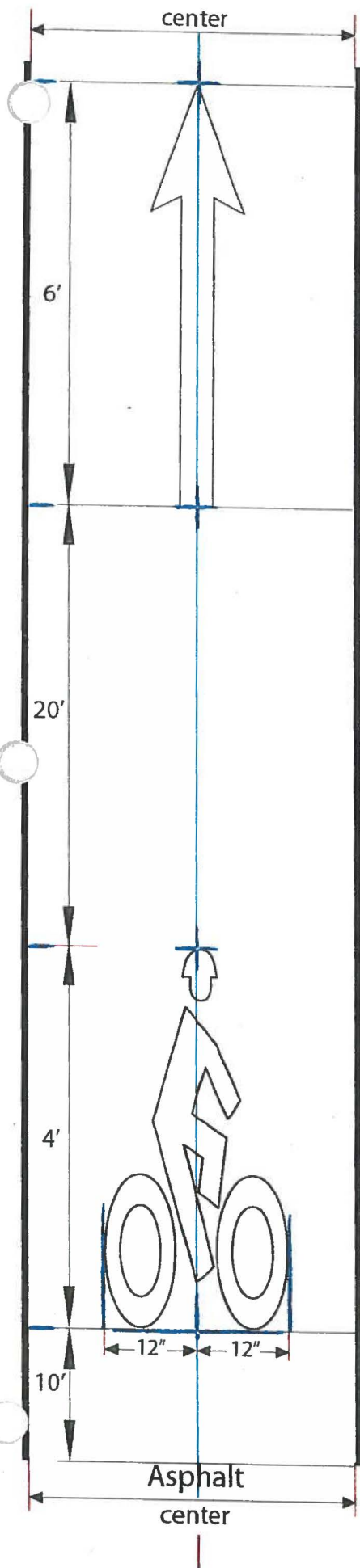
When burning with the propane torch remember to spread the reflector Glass Beads over a section at a time while the thermo is still hot & soft.

When done with the Biker measure up from the 4' mark 20' & 6' and mark with chalk.

Measure across the lane at the 20' & 6' marks and mark the middle vertical & horizontal (+).

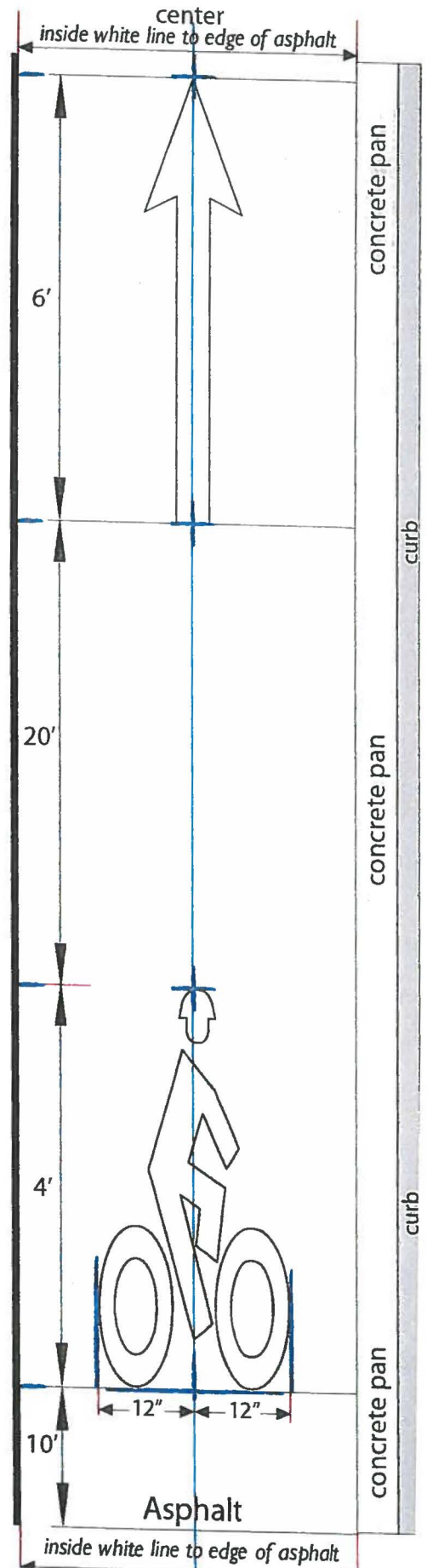
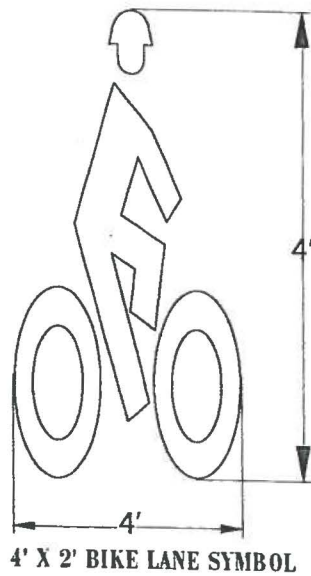
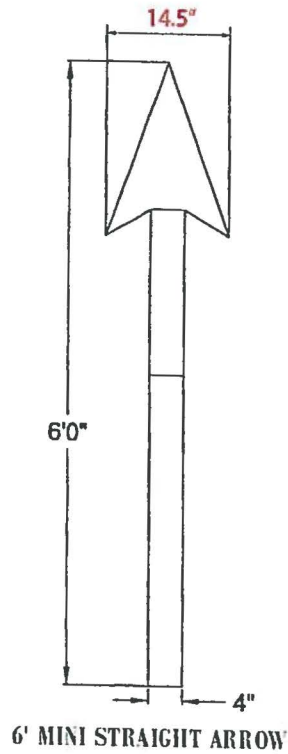
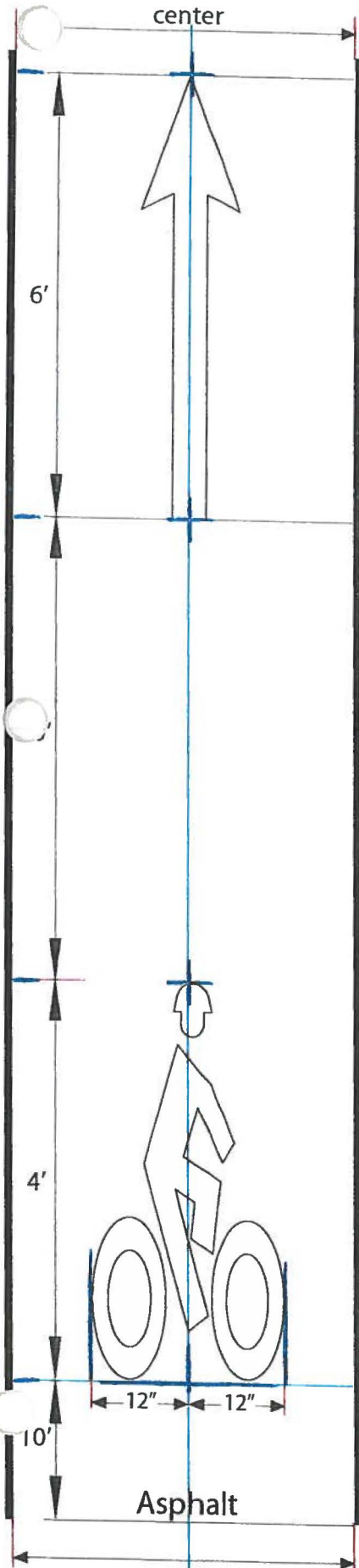
Layout the 6' arrow thermo pieces.

When centered & straight burn to the pavement with the propane torch. (spread reflector Glass Beads)



Biker & 6' Arrow Layouts (A)

ALL street variations of Biker symbols & 6' Arrows are these two (2) layouts. They will either be between two (2) white lines or between one (1) white line and the curb at the right side edge of the street.



Railroad Crossing Marking Layout

16' & 20' Railroad Xing & RR

refer to page with diagrams A & B

1) When laying down RR X on (1) lane flow of traffic, traffic control using Flaggers is necessary unless there is a Shared Lane between the opposite flows of traffic.

Stop Bar

2) Start with the "Stop Bar" which must be layed a minimum of 5' from the RR Drop Arm. Measure 5' from the Drop Arm and snap a chalk line horizontal across the lane. (diagram A)

3) Blow off the stop bar area. Lay down the 36" x 18" thermo pieces along and BEHIND the chalk line. Start laying pieces down from the 4" edge line to the double yellow lines. Cut to fit if necessary. When set burn to the pavement. (diagram A)

4) As a section of the Stop Bar is being burned to the pavement, while still hot spread some reflective glass beads down on the hot thermo. Continue this process for the entire Stop Bar. (diagram A)

Prep

5) Next step is to layout the (2) thermo borders, X & RR. The bottom thermo border will line up with the RXR sign. (diagram A & B)

6) Blow off the entire area where the (2) thermo borders, X & RR are to be layed down (roughly a 54' area from top to bottom). (diagram A)

Bottom Thermo Border

7) Start with the bottom thermo border snapping a chalk line across the lane that is lined up with the RXR sign. Repeat the steps of the Stop Bar. Only difference the thermo border goes from the inside of the 4" edge line to the inside of the double yellow lines and BEHIND the horizontal chalk line. (diagram A)

X

8) Measure up 25' from the bottom thermo border chalk line on both sides of the lane and mark with chalk. Snap a horizontal chalk line across the lane using the (2) chalk marks. (diagram A & B)

9) Make a vertical chalk mark at the center of that snapped chalk line measuring across the lane from inside the 4" edge line to the inside of the double yellow lines. This is where the center piece of the X will be placed. (diagram A & B)

10) Lay down the X thermo pieces starting with the center piece. When all pieces are laid down and lined up vertical & horizontal, start burning to the pavement. While burning thermo pieces and still hot spread some reflective glass beads down on the hot thermo. (diagram A & B)

RR

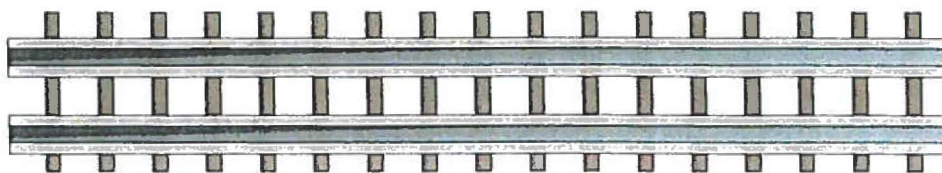
11) When X is finished snap a horizontal chalk line at the bottom legs of the X. Lay down RR pieces 10" apart on the inside and centered in line with the X. Line both RRs pieces vertical with the X. Once lined up burn to the pavement spreading reflective glass beads while still hot. (diagram B & A)

Top Thermo Border

12) Last is the top thermo border. Measure up 25' from the X center chalk line on both sides of the lane and mark with chalk. Snap a chalk line across the lane. Lay down the thermo pieces from inside the 4" edge line to the inside of the double yellow lines. Lay the pieces ABOVE the horizontal line. (diagram A)

13) When top thermo border pieces are layed down start burning to the pavement spreading reflective glass beads a section at a time while still hot. (diagram A)

Railroad Crossing Marking Layout 16' & 20' Railroad Xing & RR



Railroad Tracks



Drop Arm



minimum 5'

diagram A

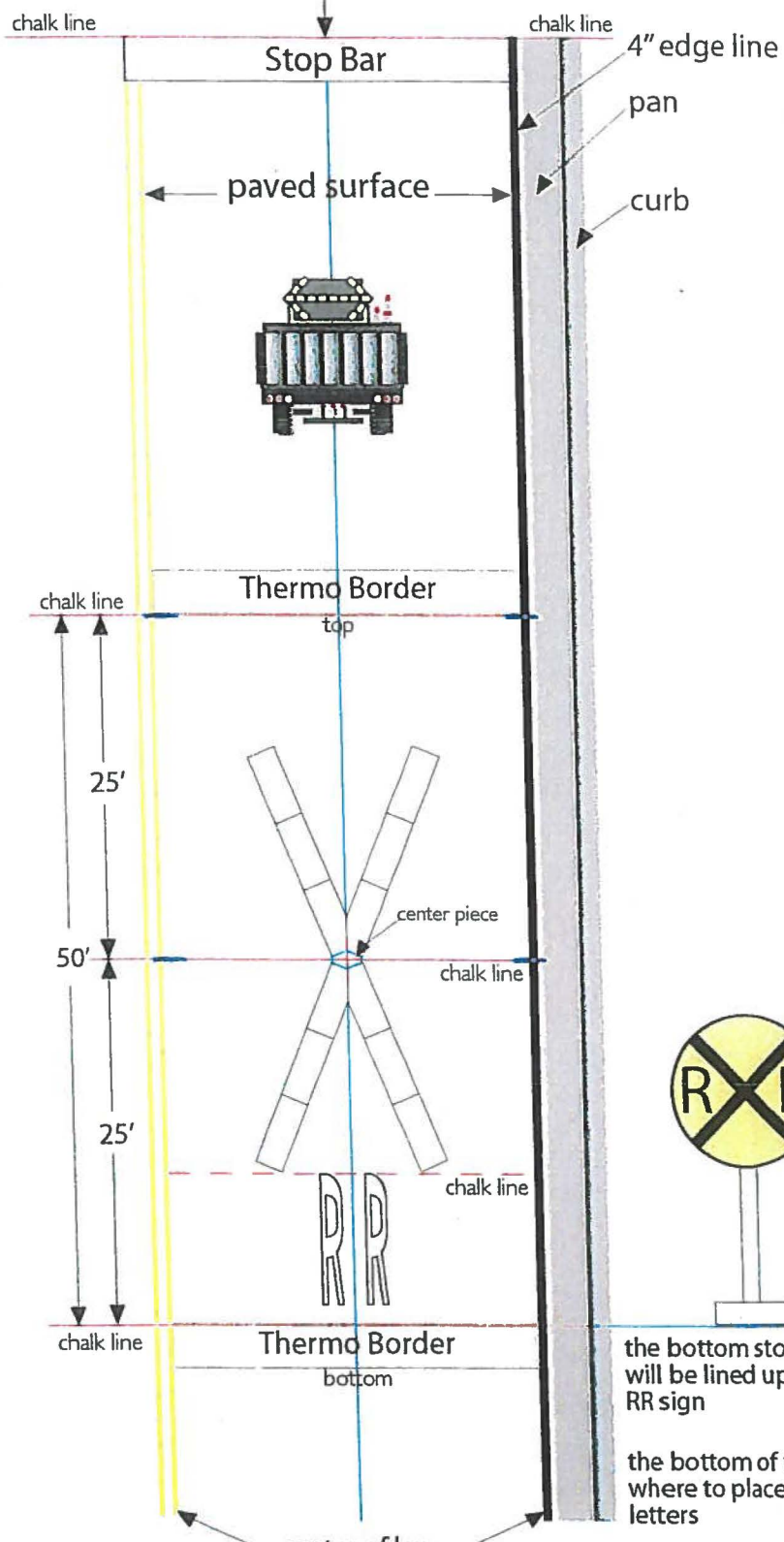


diagram B

