



The purpose of this document is to provide instruction and guidance on the creation of the various components that are included on the **Grades and Geometrics** sheets within each **Construction Plan** set.

### **Geometrics**

The following items shall be annotated for all curves larger than five feet (5') in radius, excluding triangular ("pork-chop") channelization islands:

- Radius (R)
- Point of Curvature (PC)
- Center of Curvature (CC)
- Point of Tangency (PT)

For curves equal to or less than five feet (5') in radius, the radius (R) and Center of Curvature (CC) shall be annotated on the Grades and Geometrics sheets.

When displaying geometrics for channelization islands ("pork-chop" islands), the Center of Curvature (CC) points at the three corners of the island shall be annotated.

If curb ramps are present within the project limits, the location where the curb ramp interfaces with the roadway shall be annotated. The annotated point shall be at the center of the curb ramp opening where it interfaces with the roadway. (See attached plan sheet).

### **Grades**

The following tables are based on two of the most common scenarios designers will encounter on their projects. The first one is an uncurbed typical section and the second is a curbed section. These tables provide the minimum locations that grades should be annotated on the plan sheets to provide sufficient data for construction layout.

If profiles are not provided within the Construction Plan set, coordination with the Project Manager is needed to determine what supplemental information should be provided.

#### **Section #1**

- Hot-Mix or Concrete Pavement, **without curbing**.
- Travel Lanes = 12' @ 2% Cross Slope
- Shoulders = 10' @ 4% Cross Slope

#### **Section #2**

- Hot-Mix or Concrete Pavement, **with curbing or curb & gutter**.
- Travel Lanes = 12' @ 2% Cross Slope
- Shoulders = 10' @ 4% Cross Slope



<b>Tangent Sections</b>	<b>Section #1</b>	<b>Section #2</b>
Centerline	No grades displayed.	No grades displayed.
Pavement Cross Slope Break Lines	No grades displayed.	No grades displayed.
Outer Edges of Shoulders	No grades displayed.	Grades displayed at 50' intervals, coincident with the centerline stationing.

Note: Pavement cross slopes are typically annotated near each match line, and where changes in cross slope occur. (Ex: Outside shoulder converts to a turn-lane and cross slope rotates from 4.0% to 2.0%.)

<b>Superelevation Transition Sections</b>	<b>Section #1</b>	<b>Section #2</b>
Centerline	Grades displayed at 25' intervals, coincident with the centerline stationing.	Grades displayed at 25' intervals, coincident with the centerline stationing.
Pavement Cross Slope Break Lines	Grades displayed at 25' intervals, coincident with the centerline stationing.	Grades displayed at 25' intervals, coincident with the centerline stationing.
Outer Edges of Shoulders	Grades displayed at 25' intervals, coincident with the centerline stationing.	Grades displayed at 25' intervals, coincident with the centerline stationing.

Note: Pavement cross slopes are shown at the following points:

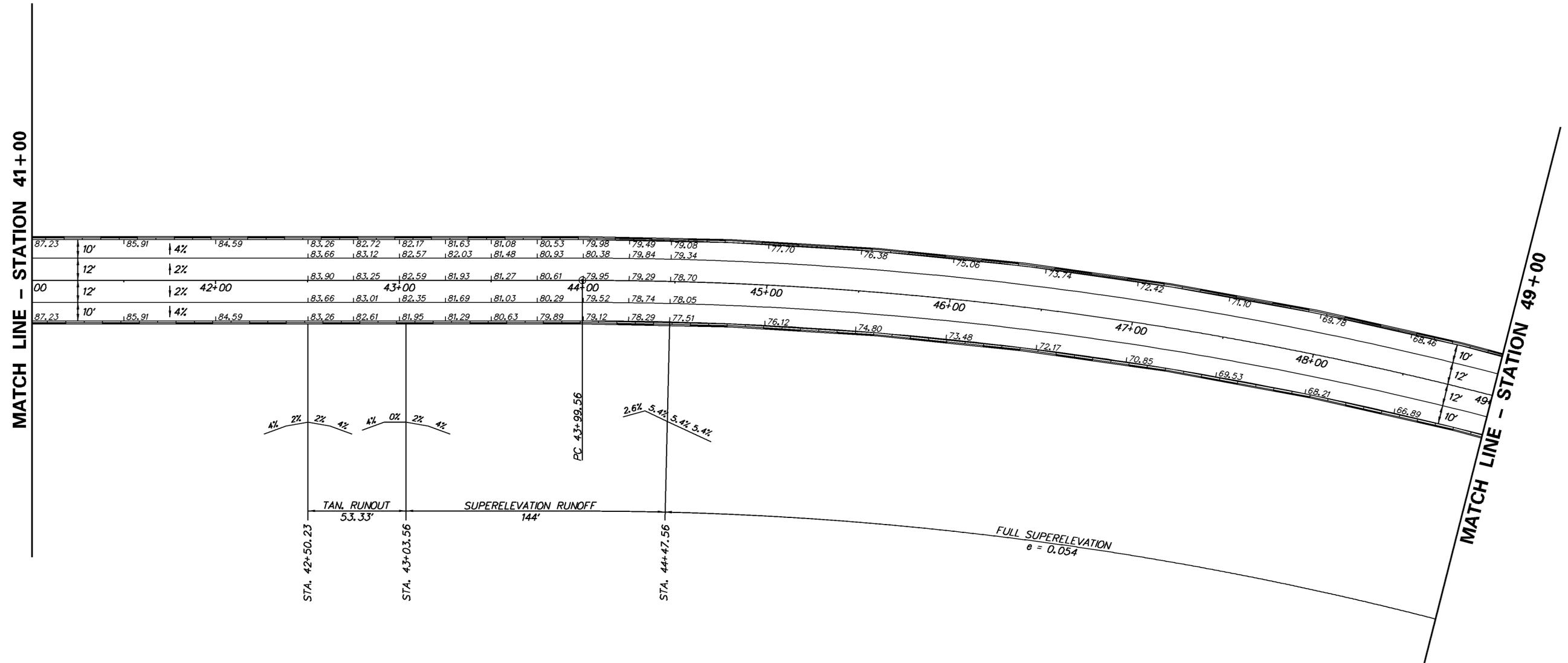
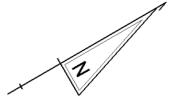
- Beginning and end of tangent runout.
- Beginning and end of superelevation runoff.
- Beginning and end of full superelevation.

<b>Full Superelevation Sections</b>	<b>Section #1</b>	<b>Section #2</b>
Centerline	No grades displayed.	No grades displayed.
Pavement Cross Slope Break Lines	No grades displayed.	No grades displayed.
Outer Edges of Shoulders	No grades displayed.	Grades displayed at 50' intervals, coincident with the centerline stationing.



Intersections	Section #1	Section #2
Centerline	Grades displayed at 25' intervals, coincident with the centerline stationing.	Grades displayed at 25' intervals, coincident with the centerline stationing.
Pavement Cross Slope Break Lines	Grades displayed at 25' intervals, coincident with the centerline stationing.	Grades displayed at 25' intervals, coincident with the centerline stationing.
Outer Edges of Shoulders	Grades displayed at 25' intervals, coincident with the centerline stationing.	Grades displayed at 25' intervals, coincident with the centerline stationing.
Radius From Mainline to Side Roads	Grades displayed at 10' intervals along radius and at sag points to verify proper drainage.	Grades displayed at 10' intervals along radius and at sag points to verify proper drainage.
<p>Note: Additional spot grades may be needed throughout the intersection to depict intended direction of drainage flow.</p>		

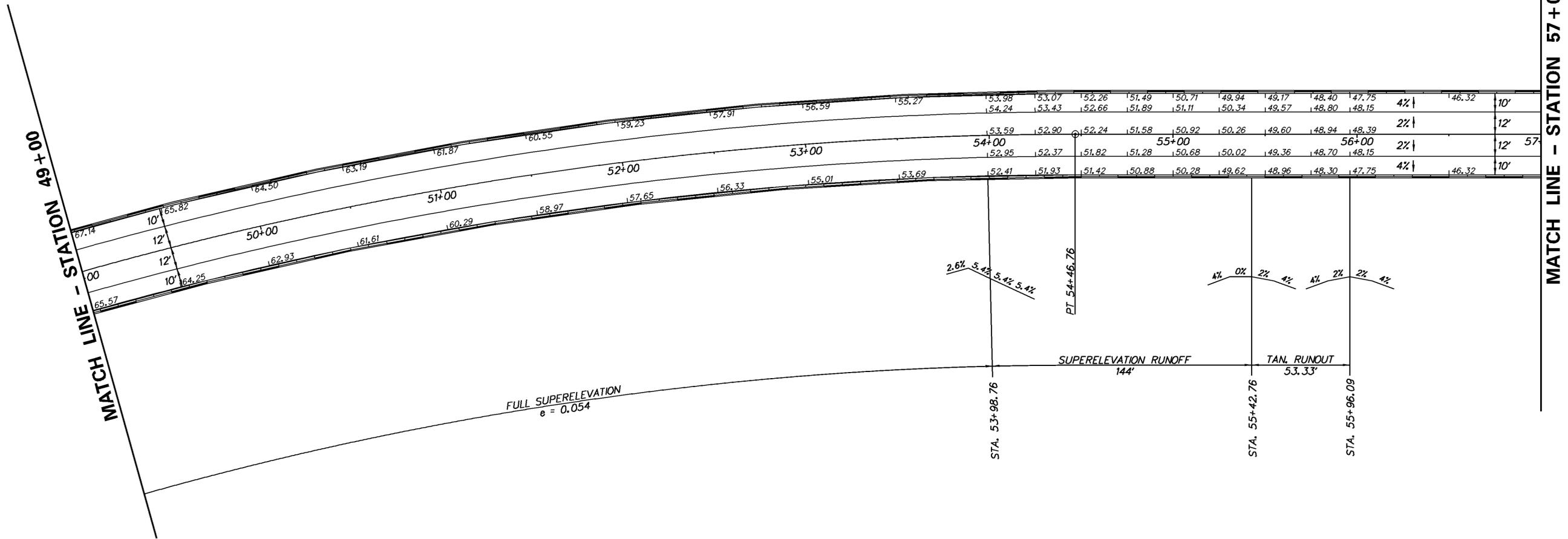
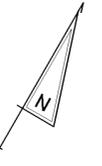
NOTE:  
 FOR CLARITY PURPOSES, SOME LINE WORK HAS BEEN REMOVED FROM THIS MODEL PLAN.  
 THE INTENT OF THIS MODEL PLAN SHEET IS TO PROVIDE AN EXAMPLE OF THE TYPE AND LOCATION OF GRADE INFORMATION THAT SHOULD BE DISPLAYED FOR SUPERELEVATED SECTIONS OF ROADWAY. THIS INFORMATION IS IN ADDITION TO THE INFORMATION THAT IS DISPLAYED ON THE "GRADES AND GEOMETRICS EXAMPLE #1" MODEL PLAN SHEET.



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	DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE 0      30      60      90 FEET	<b>DELDOT          MODEL          PLAN</b>	CONTRACT TXXXXXXXXX	BRIDGE NO. <b>X</b>	<b>GRADES AND          GEOMETRICS</b>	SHEET NO. 1
					COUNTY X	DESIGNED BY:  CHECKED BY:		TOTAL SHTS. 3

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MATCH LINE - STATION 49+00

MATCH LINE - STATION 57+00

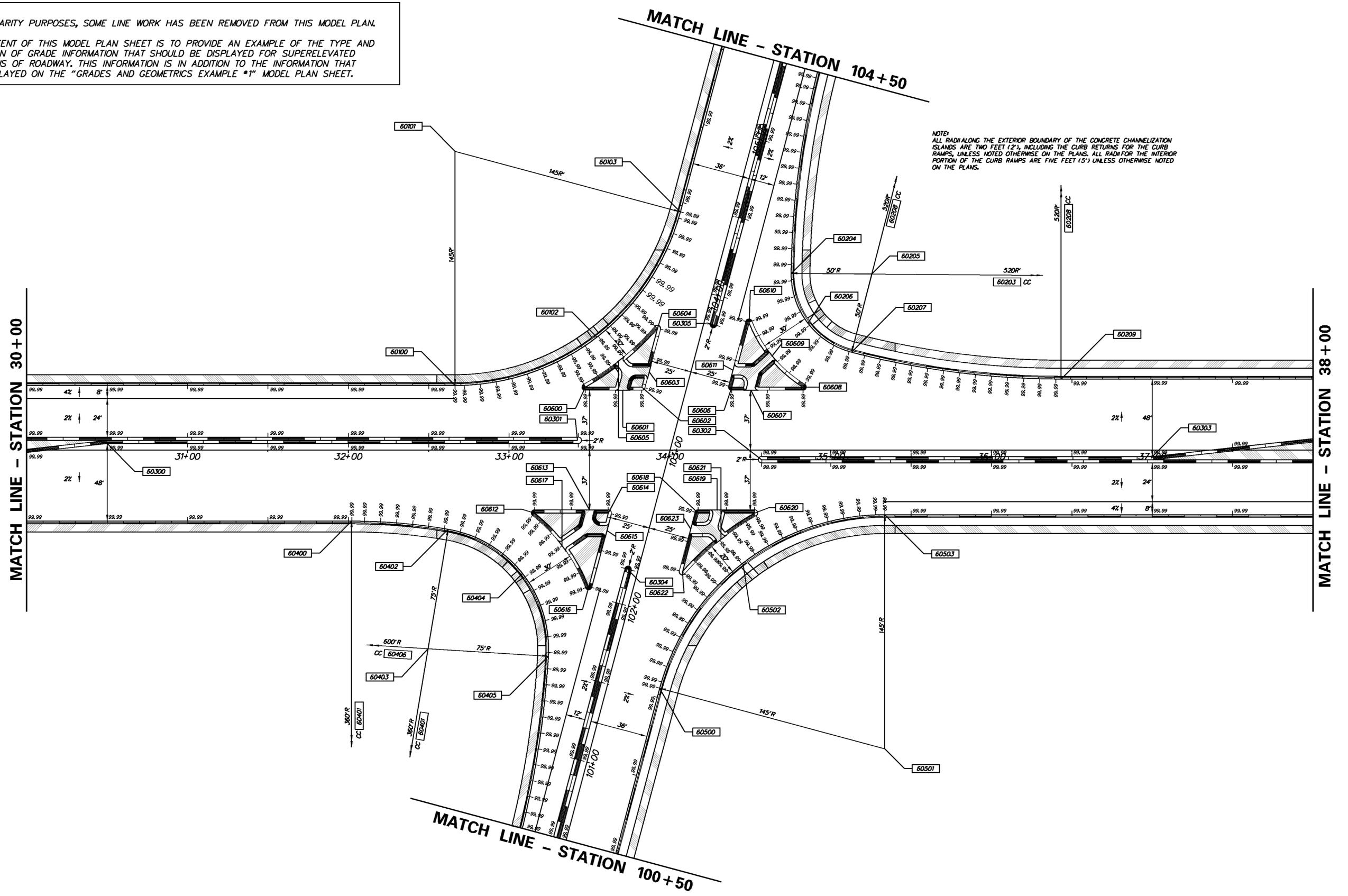
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<b>DELAWARE DEPARTMENT OF TRANSPORTATION</b>	ADDENDUMS / REVISIONS	SCALE FEET	<b>DELDOT MODEL PLAN</b>	CONTRACT TXXXXXXXXXX	BRIDGE NO. <b>X</b>	<b>GRADES AND GEOMETRICS</b>	SHEET NO. 2
					COUNTY X		DESIGNED BY:

NOTE:  
FOR CLARITY PURPOSES, SOME LINE WORK HAS BEEN REMOVED FROM THIS MODEL PLAN.

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NOTE:  
ALL RADIALS ALONG THE EXTERIOR BOUNDARY OF THE CONCRETE CHANNELIZATION ISLANDS ARE TWO FEET (2'), INCLUDING THE CURB RETURNS FOR THE CURB RAMPS, UNLESS NOTED OTHERWISE ON THE PLANS. ALL RADII FOR THE INTERIOR PORTION OF THE CURB RAMPS ARE FIVE FEET (5') UNLESS OTHERWISE NOTED ON THE PLANS.



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 <b>DELAWARE</b> <b>DEPARTMENT OF TRANSPORTATION</b>	ADDENDUMS / REVISIONS   	SCALE 0      30      60      90 FEET	<b>DELDOT</b> <b>MODEL</b> <b>PLAN</b>	CONTRACT TXXXXXXXXX	BRIDGE NO. <b>X</b>	<b>GRADES AND</b> <b>GEOMETRICS</b>	SHEET NO. 3
				COUNTY X	DESIGNED BY:  CHECKED BY:		TOTAL SHTS. 3