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 pedestrian connections are present within the project limits, the location where the connection interfaces with roadway shall be annotated. The annotated points shall be provided at each side of the pedestrian connection opening where it interfaces with the roadway pavement. (See PM-18-001 for further information).

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

Tangent Sections	Section #1	Section #2
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%.)		

Superelevation Transition Sections	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.
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.		

Full Superelevation Sections	Section #1	Section #2
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.
Note: Additional spot grades may be needed throughout the intersection to depict intended direction of drainage flow.		