

# Manual Junction Creation

## How to create a Manual Junction in Civil 3D

A typical junction can be broken up into 4 sections, the MAIN road, SIDE Road, Fillets (Radius') and Bellmouth.

We need to design each element separately and bring them together to form our junction.

The junction Corridor will be made from 4 different Assembly's

- FULL Carriageway – Including kerb, footpath earthwork sub-assemblies
- HALF Carriageway – As FULL Carriageway but only designed up to Center Line
- Junction – Similar to the FULL Carriageway assembly but with the sub-assembly features removed along the junction
- Fillet – Similar to the HALF Carriageway assembly but with the Kerb set on the assembly marker and carriageway set as a positive gradient

A 5<sup>th</sup> Temporary Surface Assembly is required to tie in the various Vertical designs. This assembly should be wider than the proposed carriageway to establish levels.

### Creating the Junction

- Junction Alignments
  - Create Main Road and SIDE Road Alignments
  - Offset by Carriageway width
  - Create Fillets (Radius') Turn into Alignments (it is key that the chainage direction runs with the traffic flow)
  - Trim to Create Bellmouth, Turn into Alignment
- MAIN Road
  - Create Surface Profile and Vertical Design
  - Create Temporary Corridor with Temporary Surface Assembly
  - Reduce Corridor Frequencies to 1m
  - Create Temporary Corridor Surface
- SIDE Road
  - Create Surface Profile and Vertical Design, Add in Temporary MAIN Road Surface and tie in
  - Create Temporary Corridor with Temporary Surface Assembly
  - Create Temporary Corridor Surface
- Set Temporary Surfaces to no display
- Change Temporary corridors to Corridors Frozen Layer



➤ BELLMOUTH

- Create Surface Profile add in MAIN Road TEMPORARY Surface
- Nothing further needs to be done to the Bellmouth alignment

➤ FILLETS

Each Fillet has to be Designed Separately

- Create Surface Profile add in MAIN Road and SIDE Road TEMPORARY Surfaces
- Create Vertical Design, Tie into MAIN Road and SIDE Road TEMPORARY Surfaces
- Repeat for Second FILLET

➤ Junction Corridor

- Baselines
  - Create Corridor on MAIN Road, Split into 3 Regions, Before the Junction, The junction, After the junction
  - Add in SIDE Road Baseline, Create region after FILLETS
  - Add in both FILLETS as Base lines, create region for entire length
- Targets and Assembly's
  - MAIN Road
    - Use FULL Carriageway Assembly before and after the junction
    - Use Junction Assembly across the Junction, Set Width and Vertical Targets to BELLMOUTH
  - FILLETS
    - Use FILLET Assembly, Set Width and Vertical Targets to BELLMOUTH and SIDE Road (Ensure target nearest is set)
  - SIDE Road
    - Use FULL Carriageway Assembly up to FILLETS
    - Add in a Region using HALF Carriageway Assembly to join FILLET and SIDE Road (if junction is not perpendicular)

Set Earthworks to target the Existing Ground Surface

Set Frequencies to 1m

➤ Additional Sections

- Add in additional section along both FILLETS to intersect between SIDE Road and BELLMOUTH to remove gap
- Add in additional sections to smooth out finished Junction Surface

