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Workshop - X9 Roadway Designer: Using Point Controls, Aliasing and Superelevation

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ROADWAY DESIGNER: USING POINT CONTROLS, ALIASING AND SUPERELEVATION

Lesson Name: Getting Started

LESSON OBJECTIVE:

In this lesson we will start InRoads and open the appropriate DGN file.

EXERCISE: GETTING STARTED

This exercise will guide you through the steps to get started

- 1. From the computer desktop double click on the InRoads Suite icon.
- 2. When the **MicroStation Open** dialog appears navigate to the following directory. *C:\2009RBC\EW-10\DATA*
- 3. Highlight the file *working.dgn* and select the **Open** button.

Lesson Name: Opening a Project

LESSON OBJECTIVE:

In this lesson we will open the project data.

EXERCISE: OPENING THE PROJECT DATA

This exercise will guide you through the steps.

- 1. From the **InRoads** menu go to **File > Open**.
- 2. Navigate to the C:\2009RBC\EW-10\DATA and highlight the file EW-10.rwk.
- 3. Select the **Open** button and then select **Cancel**.

The following data was loaded from the RWK file.

| Preference file: | civilV8i.xin |
|-------------------|---------------|
| Existing Ground: | OG.dtm |
| Controls Surface: | control.dtm |
| Geometry Project: | EW-10.alg |
| Template Library: | templates.itl |

Lesson Name: Creating Corridors

LESSON OBJECTIVE:

In this lesson we will create two road corridors using the horizontal and vertical alignments in the geometry project that you loaded.

EXERCISE: CREATING CORRIDORS

This exercise will guide you through the steps.

1. From the **InRoads** menu go to **Modeler** > **Roadway Designer**.

- 2. Maximize Roadway Designer
- 3. From Roadway Designer go to Corridor > Corridor Management.



4. When the Manage Corridors dialog appears create a corridor by entering the following data:

| Name: Surface Symbo Type: Horizontal Ali Vertical Alignu | <i>Main</i> blogy: <i>P_RO</i> gnment: ment: <i>Main</i> | AD_Edge(Alignmet Main | OfPavement nt | | |
|---|---|------------------------------|---|--------|---|
| Station Limits | : | Off | | | |
| 🦮 Manage Corrido | гs | | | | |
| Name: Main Surface Symbology: Type: Horizontal Alignment: Vertical Alignment: PI Rounding Tangent: Corridors: | P_SURF_Design Alignment Main Main 0.0000 | nSul 🗸 | Limits Station Start: 0+00.00 Stop: 25+02.23 | + | Add Close Change Copy Copy From Help |
| Name T | уре | Source Name | Start Station | Stop S | Station Delete |

- 5. Select the **Add** button.
- 6. Create another corridor using the following settings:

| Name: | Secondary |
|---------------------|-----------------------|
| Surface Symbology: | P_ROAD_EdgeOfPavement |
| Туре: | Alignment |
| Horizontal Alignmen | t: Secondary |
| Vertical Alignment: | Secondary |
| Station Limits: | On |
| Start: | 00+12.01 |
| End: | 05+50.00 |

| 🧮 Manage Corrido | rs | | | | | _ 🗆 🔀 |
|-----------------------|-------------|--------|------|-----------------|-------|-----------|
| Name: Secondary | | | | Limits | | Add |
| Surface Symbology: | P_SURF_Desi | gnSu 🔽 | | Station | | Close |
| Туре: | Alignment | ~ | | 0+12.00 | + | Change |
| Horizontal Alignment: | Secondary | ~ | + | Stop: | | |
| Vertical Alignment: | Secondary | ~ | | 5+50.00 | + | |
| PI Rounding Tangent: | 0.0000 | | | | | Copy From |
| Corridors: | | | | | | Help |
| Name T | уре | Source | Name | e Start Station | Stop | Station |
| Main Alig | gnment | Main | | 0+00.00 | 25+02 | .23 |
| | | | | | | |
| | | | | | | |
| | | | | | | Delete |

- 7. Select the **Add** button.
- 8. Close the Manage Corridors dialog.

Lesson Name: Assigning Templates

LESSON OBJECTIVE:

In this lesson we will assign the templates to the two corridors that were previously created.

EXERCISE: ASSIGNING **TEMPLATES**

- 1. From the **Roadway Designer** menu go to **File** > **New**. Enter the name *EW-10* and select the **Save** button.
- 2. From the **Roadway Designer** menu go to **Corridor** > **Template Drops**.



- 3. When the **Template Drops** dialog appears set the **Corridor** to *Main*.
- 4. Set the **Interval** to *10.00*.
- 5. Navigate to the Urban 2 Lane template in the Templates folder and highlight it.

| 🚼 Templ | ate Drops | | | _ 🗆 🔀 |
|------------------|--|--------|--------------|---------|
| Corridor: | Main | ~ | | Add |
| Station: | 0+12.00 | | † | Close |
| Interval: | 10.0000 | | + | Change |
| Library Ter | nplates: | | | |
| × × × × | < RampLT < RampRT < Rural 2 Lane < Rural 4 Lane < Rural Divided 4 Lane < Urban 2 Lane < Urban 4 Lane < Urban Divided 4 L Urban Divided 4 L | | | |
| St | Int Template | Enable | Re | Library |
| Synchror | nize with Library | | Edit | Delete |

- 6. Select Add.
- 7. Change the Station to 15+40 and the Interval to 1.00 and then select Add.
- 8. Change the **Station** to *16+60* and the **Interval** to *10.00* and then select **Add**. At this point you should have three entries in your **Template Drops** dialog.

| 🚼 Templ | ate Drops | | | _ 🗆 🗙 |
|-------------|---------------------------------|------------------------------|--------------|----------|
| Corridor: | Main | ~ | | Add |
| Station: | 16+60.00 | | + | Close |
| Interval: | 10.0000 | | - | Change |
| Library Ter | nplates: | | | |
| × | ≺ Bridge Decł | 🤇 with Rails 👘 🔼 | | Сору |
| | ≺ Ramp Entra ≺ Romol T | nce | | Help |
| | ≺ RampEi ≺ RampRT | | | |
| , × | ≺ Rural 2 Lan | e 🗌 | | ł I |
| > | ≺ Rural 4 Lan | e 📳 | | |
| | ≺ Hural Divide Nuthan 21 ar | ed 4 Lane | y I | Ξ |
| | Urban 41 ar | | | |
| < | | | • | · · · · |
| Current Te | mplate Drops: | | | |
| Station | Interval | Template | Enable | Re Li |
| 0+12.00 | 10.0000 | Urban 2 Lane | N/A | ITL C:\ |
| 15+40.00 | 10.0000 | Urban 2 Lane Urban 2 Lane | | ITL CA |
| | | | | |
| < | | | | |
| | | ~ ~ ~ | | |
| Synchror | nize with Library | · [| Edit | Delete |

- 9. Change the **Corridor** to *Secondary*.
- 10. Add the following template drops:

| Station | Template | Interval |
|--------------|--------------|----------|
| <i>00+12</i> | Urban 2 Lane | 1.00 |
| 00+80 | Urban 2 Lane | 10.00 |

11. Close the Template Drops dialog.

Lesson Name: Creating Superelevation

LESSON OBJECTIVE:

In this lesson we will create the superelevation for the Main corridor.

EXERCISE: CREATING SUPERELEVATION

This exercise will guide you through the steps.

1. From the **Roadway Designer** menu set the active corridor to *Main* in the lower left corner of the dialog.

| | -60 | -40 | -20 | 0 |
|-----------------|------|-----|---|---|
| - + - 🗖 🖬 < | | | | |
| Corridor: | Main | | | • |
| Active Surface: | OG | | Image: A set of the set of the | P |
| | | | | |
| | | | | |
| | | | | |

2. Select the Superelevation choice in the lower right corner of the dialog.

| 3+00 4+00 5+00 | ~ |
|----------------|---|
| | Process All |
| | Process Visible Range |
| Display Mode: | Normal Superelevation Overlay |
| | |

- 3. Right click in the lower right window (Superelevation Diagram window) and select **Create Superelevation Wizard > Table.**
- 4. When the **Table Wizard** appears select the superelevation table called *08_50.sup* using the button to the right of the **Table** field.
- 5. Select the Load Values From Table button at the bottom of the dialog.

| 🐂 Table ' | Wizard | | | _ 🗆 🔀 |
|-------------------|--|-------------------------|-----------------------------|--------------------------------------|
| Corridor: | Main | | | Help |
| General Table: | Superelevation Data C:\2009RBC\EW-11 | D\DATA\08_50 | sup | |
| ~ % R | unoff on Tangent | 60% | 📃 Interpolate T | able Values |
| Spec | ify Runout: | 0.0000 | Transition Leng | ths Are: |
| Non-l | Linear Curve Length: | 0.0000 | 💿 Runoff | Total Transition |
| Horizontal | Curve Sets: art Station Stop S I1.05 11+38.4 | tation Supe 48 7.70% | ereleva Table 3 08_50. | Design |
| Selected C | Curves: Load Va | lues From Table | 📃 📃 Update G | eometry from Table |
| | K Back | <u>N</u> ext > | Pre <u>f</u> erences | Close |

- 6. Select Next.
- 7. Select the **Add** button in the center of the dialog.
- 8. Setup the dialog as shown below.

| 鱰 Add Superele | vation Section | | | \mathbf{X} |
|----------------------|------------------------|----|------------------|--------------|
| Name: | Main | | | ОК |
| Crown Point: | CL | ~ | + | Cancel |
| Left Range Point: | L_EP | ~ | + | Help |
| Right Range Point: | R_EP | ~ | + | |
| Pivot Direction: | From Crown Point | ~ | | |
| Number of lanes: | 💿 Two 🛛 🔿 Four | | | |
| Runoff Length Multip | blication Factor: 1.00 | 00 | | |
| Limits Station | | | | |
| Start: | 0+00.00 | | - ф - | |
| Stop: | 25+02.23 | | + | |

- 9. Select OK.
- 10. Select Next.
- 11. Select Finish.
- 12. From the **Roadway Designer** menu go to **Corridor** > **Point Controls**. Notice there are two point controls that control the L_EP and R_EP points of the template.

| 🐂 Point Controls | | | | | | | _ 🗆 🔀 |
|------------------------|--------------|--------------------|---|----------------------|------------------------------|--|-------------|
| Corridor: Main | | | | | | | Add |
| Control Description: | | | | | | | Close |
| Point: | CL | Roth | Start: 0+0 | its).00 | + | | Change |
| Control Type: | Aliananant | boun | | JZ.Z3 | <u></u> | | |
| Horizontal Alignment: | Secondary | <u> </u> | Horizontal Start: 0.00 | Difsets 00 | + | | |
| Use as Secondary | Alignment | | Stop: 0.00 Vertical Off Start: 0.00 Stop: 0.00 | 00 sets 00 | | | |
| Horizontal and Vertica | al Controls: | | | | | | |
| E Priority I | Name | Start Station | Stop Station | Mode | Туре | Control | Description |
| X 1 L X 1 R | _EP _EP | 0+00.00 0+00.00 | 25+02.23 25+02.23 | Vertical Vertical | Superelevati Superelevati | o Main CL-L_EP:CL o Main CL-R_EP:CL | |
| <] | | 1111 | | | | | > |
| | | | | | | | Delete |

13. Close the Point Controls dialog.

Lesson Name: Adding Point Controls

LESSON OBJECTIVE:

In this lesson we will learn how to add point controls for the intersection at the two roads.

EXERCISE: ADDING POINT CONTROLS

This exercise will guide you through the steps.

- 1. From the **Roadway Designer** menu set the active corridor to *Secondary* in the lower left corner of the dialog.
- 2. From the Roadway Designer go to Corridor > Point Controls.
- **3**. Set the following values for the following fields:

| Point: | L_EP |
|-----------------------------|---------|
| Mode: | Both |
| Control Type: | Feature |
| Surface: | control |
| Feature: | CR_N |
| Use as Secondary Alignment: | On |

| Froint Controls | | | | _ 🗆 🗙 |
|---|--|--|---------|----------------|
| Corridor: Secondary1 | | | | Add |
| Control Description: | | | | Close |
| Point: L_EP | + | Station Limits Start: 0+12.01 Stop: 0+62.00 | + | Change Help |
| Control Type: Feature Surface: control Feature: CR_N ✓ Use as Secondary Alignment Priority: 1 | ✓ ✓ ✓ + | Horizontal Offsets Start: 0.0000 Stop: 0.0000 Vertical Offsets Start: 0.0000 Stop: 0.0000 | + + | |
| Horizontal and Vertical Controls: | | | | |
| E P Name Start St Sto | p St | Mode Type | Control | Description |
| | | | | > |
| | | | | Delete |

4. Select Add.

5. Set the following values for the following fields:

| Point: | R_EP |
|-----------------------------|---------|
| Mode: | Both |
| Control Type: | Feature |
| Surface: | control |
| Feature: | CR_S |
| Use as Secondary Alignment: | On |

6. Select Add.

| 🚔 Point Controls | | | | _ 🗆 🗙 |
|------------------------|---------------------|----------------------|------------|-------------|
| Corridor: Secondary | | | | Add |
| Control Description: | | | | Close |
| Point: | CL 🗸 | Station Limits | | Change |
| Mode | | Start: 0+12.01 | + | Change |
| O Horizontal 🤇 |) Vertical 💿 Both | Stop: 5+50.00 | + | Help |
| Control Type: | Alignment 💌 | - Horizontal Offsets | | |
| Horizontal Alignment: | Secondary 🗸 🚽 | - Start: 0.0000 | + | |
| Vertical Alignment: | Secondary 💌 | Stop: 0.0000 | + | |
| 🔽 Use as Secondary | Alignment | | | |
| | | Vertical Uttsets | | |
| | | Stare 0.0000 | <u>*</u> | |
| Priority: | 1 | 5.0p. 0.0000 | | |
| Horizontal and Vertica | Controls: | | | |
| E P Name | Start St., Stop St. | . Mode Type | Control | Description |
| X 1 L_EP | 0+12.00 0+62.00 | Both Feature | control:CR | |
| | 0+12.01 0+62.00 | both reature | control.cn | |
| | | | | |
| < | 1111 | | | > |
| | | | | Delete |
| | | | | |

7. Close the Point Controls dialog.

Lesson Name: Adding Additional Point Controls

LESSON OBJECTIVE:

In this lesson we will learn how to add point controls to create a by-pass lane on the southbound lane of the Main corridor.

EXERCISE: ADDING ADDITIONAL POINT CONTROLS

- 1. From the **Roadway Designer** menu set the active corridor to *Main* in the lower left corner of the dialog.
- 2. From the Roadway Designer go to Corridor > Point Controls.

| З. | Set the | following | values | for the | e following | fields: |
|----|---------|-----------|--------|---------|-------------|---------|
|----|---------|-----------|--------|---------|-------------|---------|

| | Point: | L_EP |
|----|---|--------------|
| | Mode: | Horizontal |
| | Control Type: | Alignment |
| | Alignment: | Main |
| | Station Limit: | |
| | Start: | <i>14+00</i> |
| | Stop: | 15+00 |
| | Horizontal Offset: | |
| | Start: | -12 |
| | End: | -24 |
| | Use as Secondary Alignment: | Off |
| 4. | Select Add. | |
| 5. | Set the following values for the follow | ving fields: |
| | Point: | L_EP |
| | Mode: | Horizontal |
| | Control Type: | Alignment |
| | Alignment: | Main |
| | Station Limit: | |
| | Start: | <i>15+00</i> |
| | Stop: | <i>17+00</i> |
| | Horizontal Offset: | |
| | Start: | -24 |
| | End: | -24 |
| | Use as Secondary Alignment: | Off |
| 6. | Select Add. | |
| 7. | Set the following values for the follow | ving fields: |
| | Point: | L_EP |
| | Mode: | Horizontal |
| | Control Type: | Alignment |
| | Alignment: | Main |
| | Station Limit: | |
| | Start: | 17+00 |
| | Stop: | 18+00 |
| | Horizontal Offset: | |
| | Start: | -24 |
| | End: | -12 |

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Use as Secondary Alignment: Off

8. Select Add.

| Roint Controls | | | |
|--|---|--|-------------|
| Corridor: Main | | | Add |
| Control Description: | | | Close |
| Point: | | Station Limits Start: 0+00.00 | Change |
| Horizontal | Vertical O Both | stop: 25+02.23 | Lieb |
| Control Type: | Alignment 🖍 | - Horizontal Offsets | |
| Horizontal Alignment: | Secondary 💽 🛨 | Start: 0.0000 🔶 | |
| Use as Secondary Priority: Horizontal and Vertical | Alignment 1 I Controls: | Stop: 0.0000 + Vertical Offsets + Start: 0.0000 + Stop: 0.0000 + | |
| E P Name | Start St Stop St | Mode Type Control | Description |
| X 1 L_EP X 1 R_EP X 1 L_EP X 1 L_EP X 1 L_EP X 1 L_EP | 0+00.00 25+02.23 0+00.00 25+02.23 14+00.00 15+00.00 15+00.00 17+00.00 17+00.00 18+00.00 | Vertical Superelev Main CL-L Vertical Superelev Main CL-R Horizontal Alignment Main Horizontal Alignment Main Horizontal Alignment Main | I |
| < | Ш | | > |
| | | | Delete |

Lesson Name: Target Aliasing

LESSON OBJECTIVE:

In this lesson we will learn how to add target aliasing so the connecting road sees the main road.

EXERCISE: TARGET ALIASING

- 1. From the **Roadway Designer** menu set the active corridor to *Secondary* in the lower left corner of the dialog.
- 2. From the **Roadway Designer** menu go to **Tools > Target Aliasing**.

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3. When the **Target Aliasing** dialog appears highlight the following surfaces in the left pain.

Corridor – Main

- Surface OG
- 4. Select Add.

| 🔚 Target Aliasing | | | × |
|--------------------------|---|---|----------------------|
| Target: KActive Surface> | Add -> <- Remove Move Up Move Down | Aliases: Corridor - Main Surface - OG | OK Cancel Help |
| | | Use Closest | |

5. Select OK on the Target Aliasing dialog.

Lesson Name: Modeling the Corridor

LESSON OBJECTIVE:

In this lesson we will learn how to model the corridors using the settings we have created.

EXERCISE: MODELING THE CORRIDOR

- 1. From the **Roadway Designer** go to **Corridor** > **Create Surface**.
- 2. When the **Create Surface** dialog box appears enter the surface name *Design* in the **Name** field.
- 3. Make sure both corridors are highlighted in the Create Surface(s) from list.
- 4. Select the Clipping Option button.
- 5. When the Clipping Options dialog appears there should only be one entry. Make sure it is set to **Clip All**. If it is not click on the right most column and it will change.

| 🐂 Clippi | ng Options | | × |
|------------------|--------------------------------|-----------------------------|----------------------|
| Corridor Main | Clipping Corridor Secondary | Clipping Option Clip All | OK Cancel Help |

- 6. Select OK.
- 7. Make sure all the other settings on the dialog are as follows:

| 😽 Create Surface | l | | | × |
|--|-----------------------|----------|---------|-----------------|
| Name: | Design | | ~ | Apply |
| Default Preference: | Proposed | | ~ | Close |
| Create Surface(s) from | i: | | | Preferences |
| Main Secondary | | | | Help |
| | | All | le | |
| Clip | ping Options | | | |
| General Options | Each Corridor | Create | e Alter | nate Surfaces |
| 🗹 Empty Design Su | rface | Proce | ess Vis | ible Range Only |
| Include Null Points Remove Loops | | | | |
| 🗹 Triangulate | | | | |
| Features Duplicate Names: Append Add Transverse I |) Replace Features | () Renam | e (|) Modify |
| Style: | P TOPO Br | eakline | ~ | |
| Add Exterior Bou | ndary | | | |
| Style: | P_TOPO_Ex | terior | ~ | |
| Densify using Chord | Height Tolera | nce | Displa | ay in Plan View |
| Vertical Curves | | | | omponents |

- 8. Select Apply.
- 9. Close the Create Surface dialog and collapse the Roadway Designer dialog.