



NETTWERK

Modellering av vegkryss i 3D

Patrick Mc Gloin



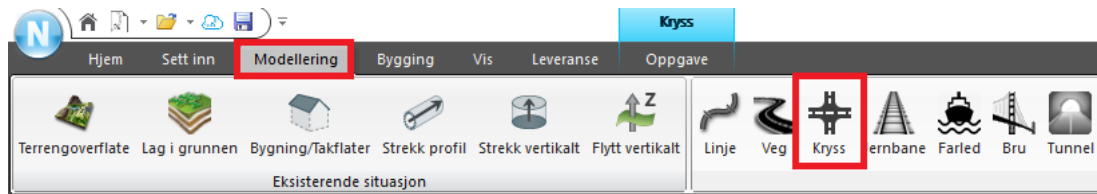
AGENDA

- Agenda
 - Gjennomgang av 3D Kryss + Endringer siden sist
 - DEMO
 - Spørsmål og svar



3D kryssfunksjon

Egen oppgave under Modellering



Ny – Kryss nå produserer solid volumer for overbygningsslag

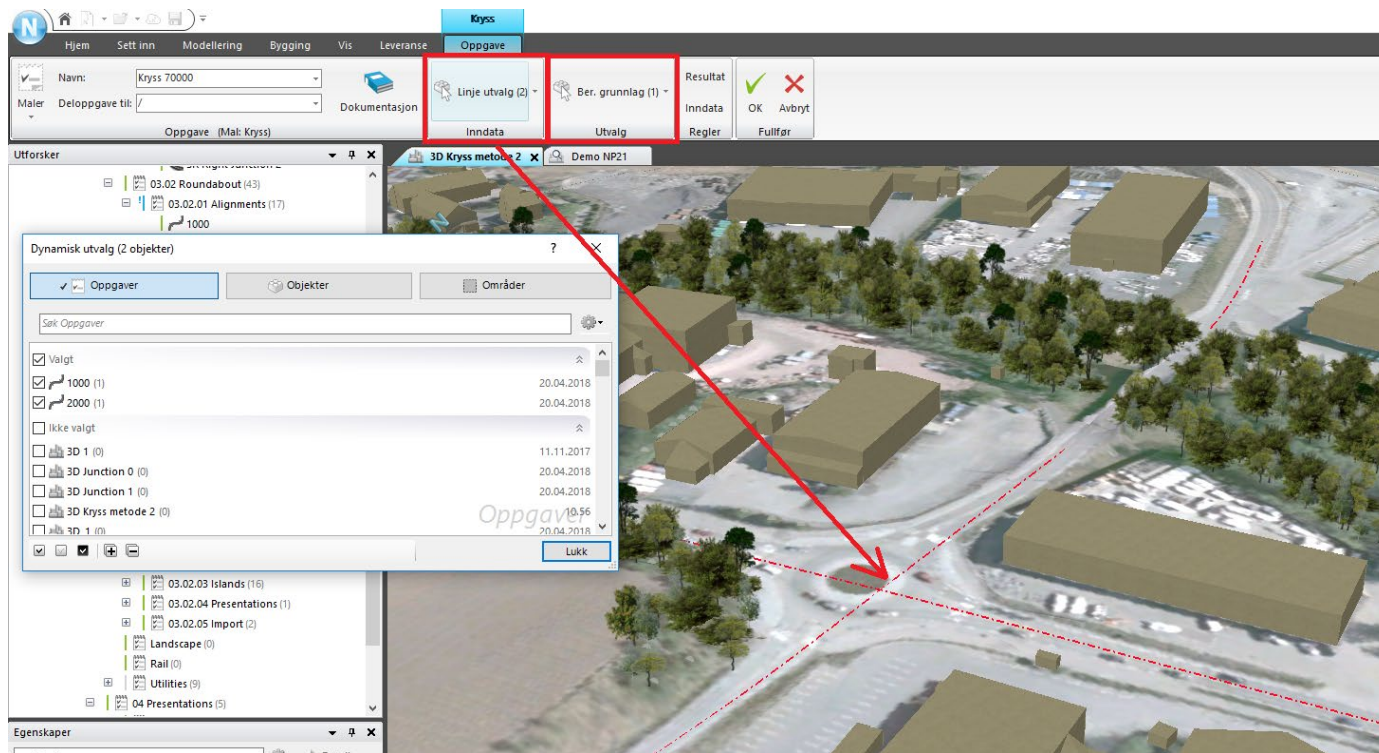
Ny – Armene kan dras langs senterlinje til et bestemt profil nr.

Ny – Ny mal for bare trafikk område

Ny – Oppdatert brukerveiledning

3D kryssfunksjon

Inputdata - veg senterlinjene og terrengoverflate (uten lag i grunnen)



3D kryssfunksjon

Velg **Åpne** på oppgaven:

Create parametric intersection

Type

T Turning hammer

O Circular cul-de-sac

X Secondary road

Y

Show

Surface

Contour lines 0.050

Triangle model

Attribute	Attribute value	Description
Intersection		
Interpolation method	Parallel	Method is used to compute helping lines to the surface model. These ir
Main road method	S curve	Method to compute main road edge. 'S curve' fits a S curve between leg
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Leg 1		
Main road leg	Yes	Main road leg
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Type	None	The island type used for this leg
Leg 2		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the l
Trimming length	30.000	The station distance from the main road or roundabout by which the tr
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Type	None	The island type used for this leg
Leg 3		
Main road leg	Yes	Main road leg
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically

Tekla Civil Intersection Tool: Kryss 75000

Tunnel VÅKabel Arealplan Terrengforming Volum Skrånings

Ny situasjon

X=1212881.027 Y=98353.399 Z=28.941

Ground surface

3D kryssfunksjon

Velg **Åpne** på oppgaven:

Create parametric intersection

Type

- T Turning hammer
- O Circular cul-de-sac
- X Secondary road
- Y

Show

- Surface
- Contour lines 0.050
- Triangle model

Attribute	Attribute value	Description
Intersection		
Style	Circular	The shape of the roundabout
Radius	8.000	The radius of the roundabout
The width of the lane	7.000	The width of the lane
The slope of the lane (e.g. 0.03)	-0.030	The slope of the lane
The width of the inner area	0.500	The width of the inner area
The width of the outer area	0.000	The width of the outer area
Curb height	0.000	Height of island curb. Note that zero and negative values are also possible
Tilting	Automatic	Method to compute angle of tilt for the roundabout
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Island's area structure		Double click to select structure type
Leg 1		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the l
Trimming length	30.000	The station distance from the main road or roundabout by which the tri
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Widen right lane	No	Enable widening of incoming direction
Widen left lane	No	Enable widening of outgoing direction
Type	None	The island type used for this leg
Leg 2		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the l
Trimming length	30.000	The station distance from the main road or roundabout by which the tri
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right

Tekla Civil Intersection Tool: Kryss 75000

X=1212881.027 Y=98353.399 Z=28.941 Ground surface

3D kryssfunksjon

Velge de parameter man vil ender på – leg på trafikk øy – velg overbygning:

The image shows a screenshot of the Tekla Civil Intersection Tool software interface. The main window displays a 3D model of a roundabout intersection with a central island and four legs. The interface includes several dialog boxes and a parameter list.

Create parametric intersection

Type:

- Turning hammer
- Circular cul-de-sac
- Secondary road
- Y

Attribute	Attribute value	Description
Intersection		
Style	Circular	The shape of the roundabout
Radius	8.000	The radius of the roundabout
The width of the lane	7.000	The width of the lane
The slope of the lane (e.g. 0.03)	-0.030	The slope of the lane
The width of the inner area	0.500	The width of the inner area
The width of the outer area	0.000	The width of the outer area
Curb height	0.000	Height of island curb. Note that zero and negative values are not allowed
Tilting	Automatic	Method to compute angle of tilt for the roundabout
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Island's area structure		
Leg 1		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the leg is trimmed
Trimming length	30.000	The station distance from the main road or roundabout by which the leg is trimmed
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Widen right lane	No	Enable widening of incoming direction
Widen left lane	No	Enable widening of outgoing direction
Type	Roundabout isla...	The island type used for this leg
Continuous chamfering	Yes	The chamfering object (island) continues all the way out to the end of the leg
Slope reference	Crown to left	This property has an effect on the elevation of the island. Choose 'Crown to left' or 'Crown to right'
Shoulder left	0.250	The width of the shoulder
Shoulder right	0.250	The width of the shoulder
Walking path distance	6.500	Distance from front of island to the beginning point of pedestrian walking path
Walking path width	0.000	Width of walking path of the island.

Structure template selection

- Intersection Traffic Area with Side Area
- Intersection Traffic Area without Side Area

Structure properties

Select structure...

3D kryssfunksjon

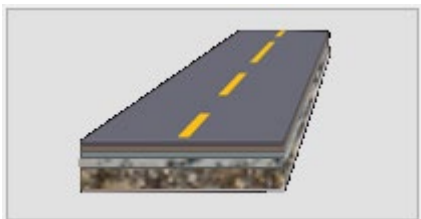
Select structure:
(Velg overbygning og
terreng tilpasning)



Parameter	Type	Value
1-1) Wearing course	Delta z	0.05000
2-1) Binder 1	Delta z	0.05000
2-2) Binder 2	Delta z	0.05000
3-1) Base 1	Delta z	0.10000
3-2) Base 2	Delta z	0.10000
3-3) Base 3	Delta z	0.10000
4-1) Sub-base 1	Delta z	0.20000
4-2) Sub-base 2	Delta z	0.20000
4-3) Sub-base 3	Delta z	0.20000
5-1) Filter	Delta z	0.00100
Cut slope	Gradient	1.00000
Ditch bottom width	Distance	0.50000
Ditch depth	Delta z	0.50000
Ditch slope	Gradient	-0.50000
Fill slope	Gradient	-0.50000
Inner slope	Gradient	-0.66700
Side course slope	Gradient	-0.03000

3D kryssfunksjon

Select structure (Velg overbygning):



Parameter	Type	Value
1-1) Wearing course	Delta z	0.05000
2-1) Binder 1	Delta z	0.05000
2-2) Binder 2	Delta z	0.05000
3-1) Base 1	Delta z	0.10000
3-2) Base 2	Delta z	0.10000
3-3) Base 3	Delta z	0.10000
4-1) Sub-base 1	Delta z	0.20000
4-2) Sub-base 2	Delta z	0.20000
4-3) Sub-base 3	Delta z	0.20000
5-1) Filter	Delta z	0.00100

3D kryssfunksjon – Overordnet planlegging

3D rundkjøring lagres til NP Basis. Endre parametere og velg **Update**

The image displays the Tekla Civil Intersection Tool interface. On the left, the 'Create parametric intersection' dialog box is open, showing various settings for a roundabout. The 'Update' button at the bottom is highlighted with a red box. The main window shows a 3D perspective view of a roundabout with a central island and four legs. The right side of the window shows a top-down view of the same roundabout, with the central island and legs highlighted in green and orange. The status bar at the bottom right indicates the ground surface elevation at the intersection point: X=1212869.575, Y=98361.360, Z=28.926.

Attribute	Attribute value	Description
Intersection		
Style	Circular	The shape of the roundabout
Radius	8.000	The radius of the roundabout
The width of the lane	7.000	The width of the lane
The slope of the lane (e.g. 0.03)	-0.030	The slope of the lane
The width of the inner area	0.500	The width of the inner area
The width of the outer area	0.000	The width of the outer area
Curb height	0.000	Height of island curb. Note that zero and negati
Tilting	Automatic	Method to compute angle of tilt for the roundab
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Island's area structure		
Double click to select structure type		
Leg 1		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geomet
Trimming length	30.000	The station distance from the main road or roun
Minimize road leg	Yes	The method used to define if a road leg is minir
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Widen right lane	No	Enable widening of incoming direction
Widen left lane	No	Enable widening of outgoing direction
Type	Roundabout isla...	The island type used for this leg
Continuous channeling	No	The channeling object (island) continues all the
Slope reference	Crown to left	This property has an effect on the elevation of th
Shoulder left	0.250	The width of the shoulder
Shoulder right	0.250	The width of the shoulder
Walking path distance	6.500	Distance from front of island to the beginning p
Walking path width	0.000	Width of walking path of the island.

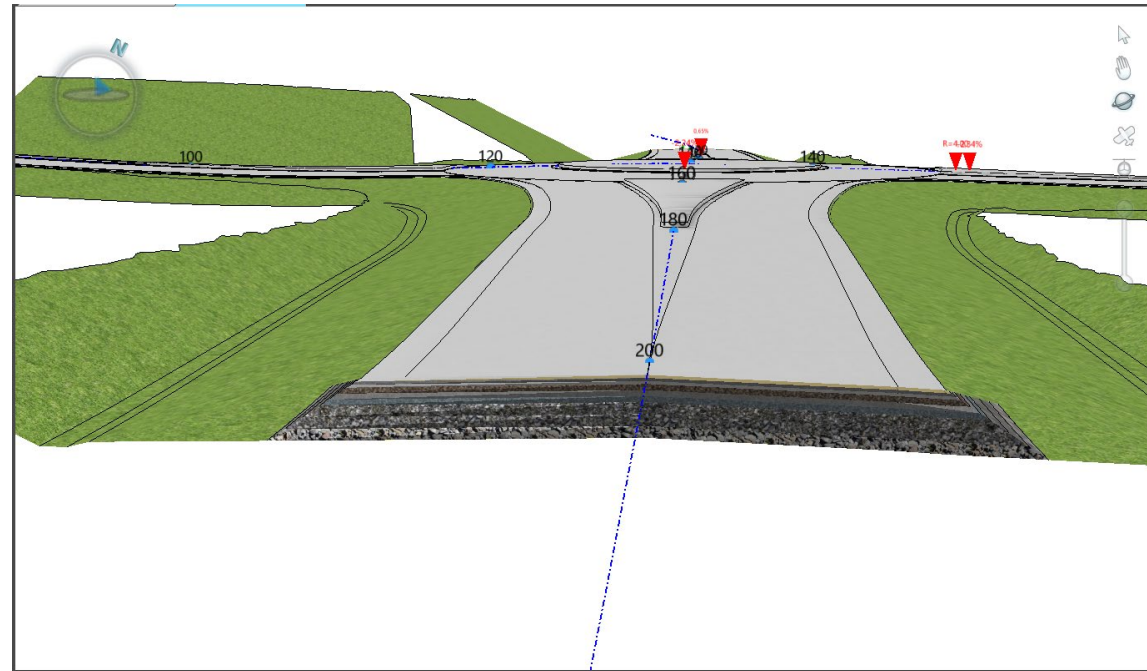
3D kryssfunksjon

Beregnet mot terrenng:



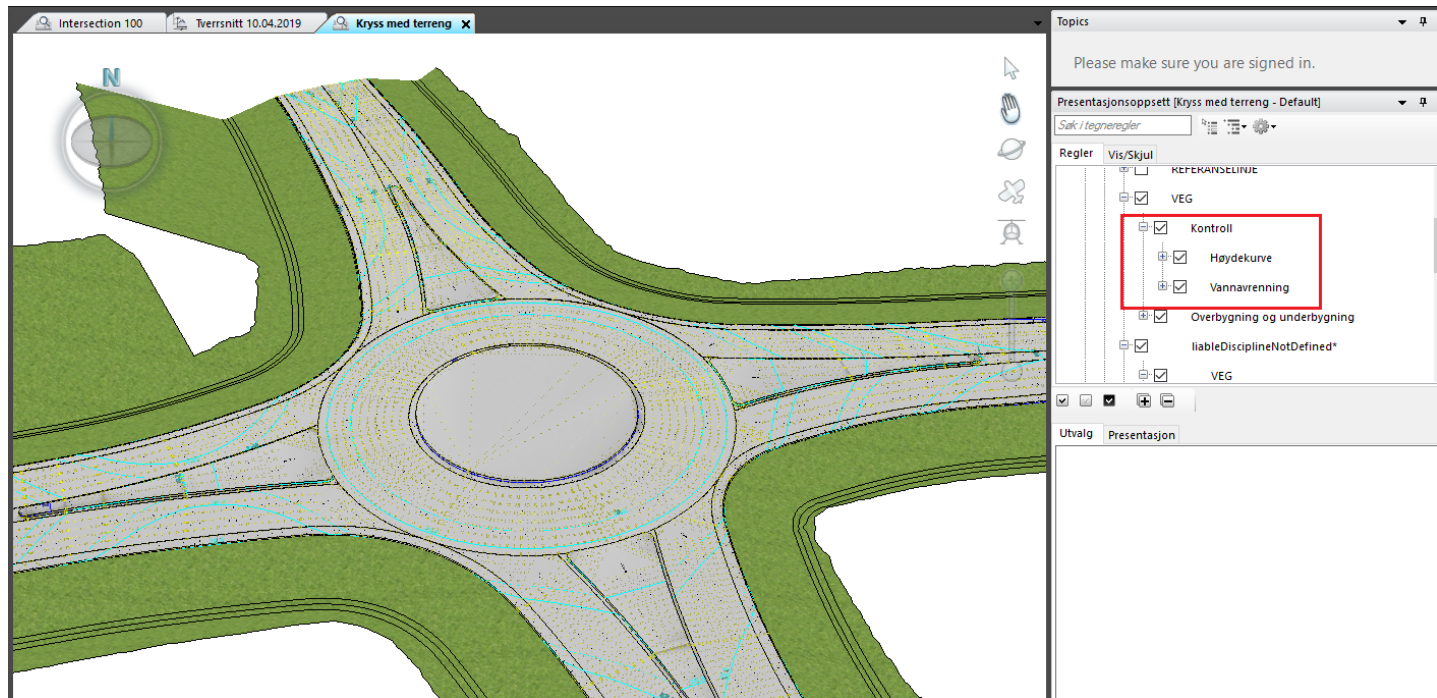
3D kryssfunksjon

Beregnet mot terreng:



3D kryssfunksjon

...med analyse visning:

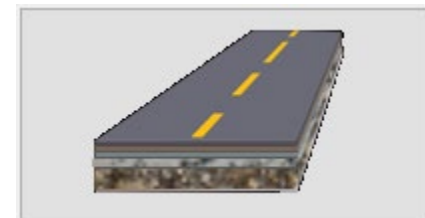
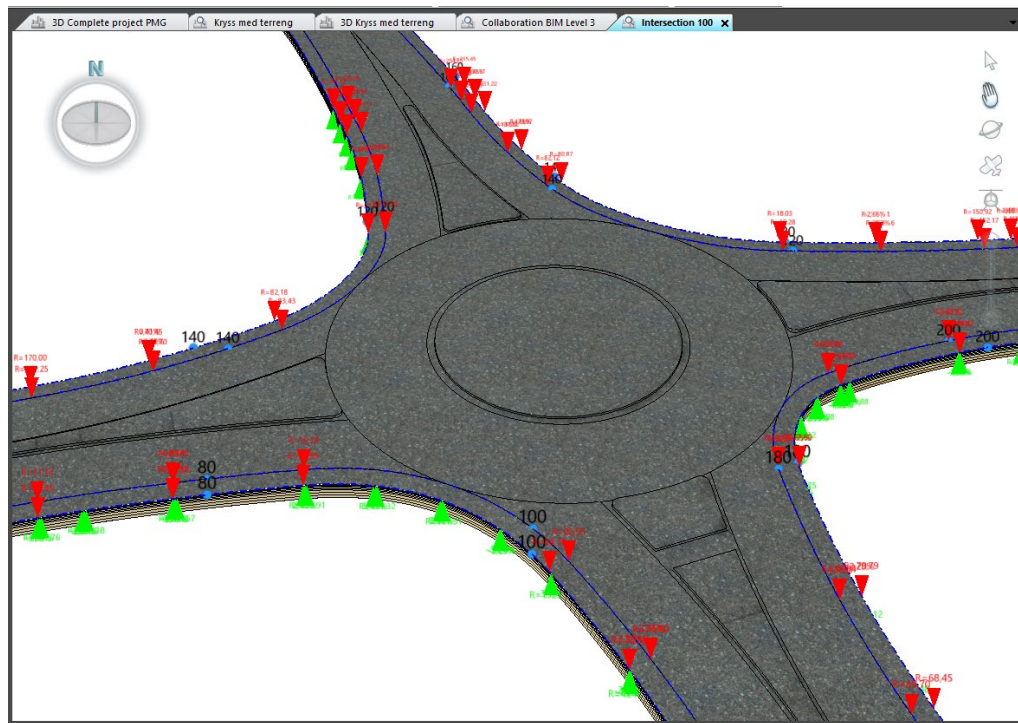


3D kryssfunksjon - Byggeplan

Definere kobling til terreng med egne vegmodeller:

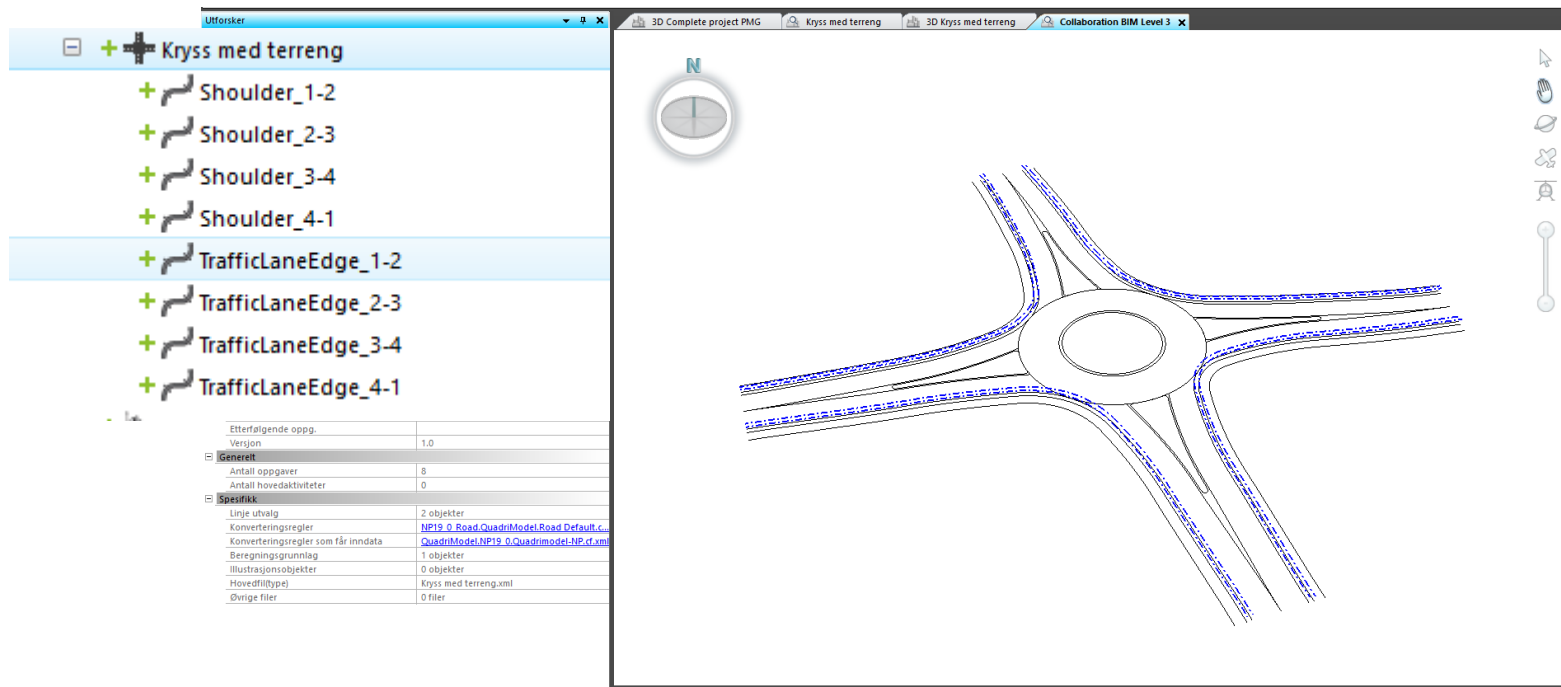


3D kryssfunksjon – Steg 1 – bygg trafikk område



3D kryssfunksjon –

3D strengene er skapt automatisk, kantlinjene som egne oppgaver:



The screenshot displays a software interface with a task list on the left and a 3D model of a road intersection on the right. The task list is organized into a tree structure under the heading 'Kryss med terreng'. It includes sub-items for 'Shoulder' and 'TrafficLaneEdge' for four different road segments (1-2, 2-3, 3-4, 4-1). Below the list is a table with project details.

Etterfølgende oppg.	
Versjon	1.0
Generelt	
Antall oppgaver	8
Antall hovedaktiviteter	0
Spesifik	
Linje utvalg	2 objekter
Konverteringsregler	NP19_0_Road_QuadriModel.Road.Default.c...
Konverteringsregler som får inndata	QuadriModel.NP19_0_QuadriModel.NP.d.xml
Beregningsgrunnlag	1 objekter
Illustrasjonsobjekter	0 objekter
Hovedfiltype	Kryss med terreng.xml
Øvrige filer	0 filer

The 3D model on the right shows a central circular intersection with four roads extending outwards. The road edges are highlighted with blue dashed lines. A north arrow is visible in the top left corner of the model view, and a vertical toolbar with various icons is on the right side.

3D kryssfunksjon – Steg 2 bygg vegmodller

The screenshot displays a 3D road design software interface. The main view shows a 3D model of a road intersection with various road models and terrain data. The interface includes several panels:

- Utforsker (Explorer):** Shows a tree view of the project structure, including "501 ROAD MODELS (86)", "5011 ROAD UNDER DESIGN (41)", and "Intersection 100".
- Egenskaper (Properties):** Shows the properties of the selected road model, "Intersection 100 Road 1-2".
- 3D View:** Shows a 3D model of the road intersection with various road models and terrain data. The model includes a central roundabout and several intersecting roads. The roads are labeled with their respective widths (e.g., 140, 80, 100, 200) and various data points (e.g., R=170.00, R=82.18, R=18.03, R=200% 1, R=150% 2, R=100% 1, R=100% 2, R=100% 3, R=100% 4, R=100% 5, R=100% 6, R=100% 7, R=100% 8, R=100% 9, R=100% 10, R=100% 11, R=100% 12, R=100% 13, R=100% 14, R=100% 15, R=100% 16, R=100% 17, R=100% 18, R=100% 19, R=100% 20, R=100% 21, R=100% 22, R=100% 23, R=100% 24, R=100% 25, R=100% 26, R=100% 27, R=100% 28, R=100% 29, R=100% 30, R=100% 31, R=100% 32, R=100% 33, R=100% 34, R=100% 35, R=100% 36, R=100% 37, R=100% 38, R=100% 39, R=100% 40, R=100% 41, R=100% 42, R=100% 43, R=100% 44, R=100% 45, R=100% 46, R=100% 47, R=100% 48, R=100% 49, R=100% 50, R=100% 51, R=100% 52, R=100% 53, R=100% 54, R=100% 55, R=100% 56, R=100% 57, R=100% 58, R=100% 59, R=100% 60, R=100% 61, R=100% 62, R=100% 63, R=100% 64, R=100% 65, R=100% 66, R=100% 67, R=100% 68, R=100% 69, R=100% 70, R=100% 71, R=100% 72, R=100% 73, R=100% 74, R=100% 75, R=100% 76, R=100% 77, R=100% 78, R=100% 79, R=100% 80, R=100% 81, R=100% 82, R=100% 83, R=100% 84, R=100% 85, R=100% 86, R=100% 87, R=100% 88, R=100% 89, R=100% 90, R=100% 91, R=100% 92, R=100% 93, R=100% 94, R=100% 95, R=100% 96, R=100% 97, R=100% 98, R=100% 99, R=100% 100).

Egenskaper	
Veg	
Interne egenskaper	
Oppgavetype-ID	685
GUID	e493538a-fd9c-4b57-a42e-d4a96dca6994
Generelt	
Navn	Intersection 100 Road 1-2
Beskrivelse	Veg
Type	Veg
Opprettet dato	27.11.2018 13.14
Sist endret	27.11.2018 13.26
Deloppgave til	5011 ROAD UNDER DESIGN
Modell	Collaboration BIM Level 3
Sekvensnr.	0
Foregående oppg.	Ground Surface complete
Etterfølgende oppg.	CalculationBasis_ManholeTopCover, Ca...
Versjon	2.0
Spesifikk	
Vegstandard	Norway (2013)
Dimensjoneringsklasse	H1
Tverrfall	Nei
Breddeutvidelse	Nei
Tool Tutorial	

3D kryssfunksjon – Steg 2 bygg vegmodller

The screenshot displays a 3D road design software interface. The main view shows a 3D model of a road intersection with various road models, including a roundabout and several approach roads. The model is rendered in a 3D perspective view, showing the road surface, curbs, and surrounding terrain. A red arrow points from the 'Intersection 100 Road 2-3' entry in the 'Utforsker' (Explorer) panel to the corresponding road model in the 3D view.

Utforsker (Explorer) Panel:

- 3D ROAD(S) (9/7)
- 501 ROAD MODELS (86)
 - 5011 ROAD UNDER DESIGN (41)
 - 10000
 - 20000
 - Intersection 100
 - Intersection 100 Road 1-2
 - Intersection 100 Road 2-3**
 - Intersection 100 Road 3-4
 - Intersection 100 Road 4-1
 - Intersection old conversion
 - Kryss med terreng
 - Shoulder_1-2

Egenskaper (Properties) Panel:

Veg

Interne egenskaper (Internal Properties):

Oppgavetype-ID	684
GUID	482d2882-7313-412c-8b36-f9929a009c59

Generelt (General):

Navn	Intersection 100 Road 2-3
Beskrivelse	Veg
Type	Veg
Opprettet dato	27.11.2018 13.13
Sist endret	27.11.2018 13.26
Deloppgave til	5011 ROAD UNDER DESIGN
Modell	Collaboration BIM Level 3
Sekvensnr.	0
Foregående oppg.	Ground Surface complete
Etterfølgende oppg.	CalculationBasis_ManholeTopCover, Ca...
Versjon	2.0

Spesifikk (Specific):

Vegstandard	Norway (2013)
Dimensjoneringsklasse	H1
Tverrfall	Nei
Breddeutvidelse	Nei
Tool Tutorial	

3D kryssfunksjon – Steg 2 bygg vegmodller

The screenshot displays a 3D road design software interface. The main view shows a roundabout with various road segments and curves. A red arrow points from the 'Intersection 100 Road 3-4' entry in the 'Utforsker' (Explorer) panel to the corresponding road segment in the 3D model. The 'Egenskaper' (Properties) panel is open, showing details for the selected road segment.

Utforsker (Explorer) Panel:

- 3D KURVS (3/1)
- 501 ROAD MODELS (86)
- 5011 ROAD UNDER DESIGN (41)
 - 10000
 - 20000
 - Intersection 100
 - Intersection 100 Road 1-2
 - Intersection 100 Road 2-3
 - Intersection 100 Road 3-4
 - Intersection 100 Road 4-1
 - Intersection old conversion
 - Kryss med terreng
 - Shoulder_1-2

Egenskaper (Properties) Panel:

Veg

Interne egenskaper (Internal Properties):

Oppgavetype-ID	683
GUID	569ce289-bde9-4f98-b9d1-f5e100b915fc

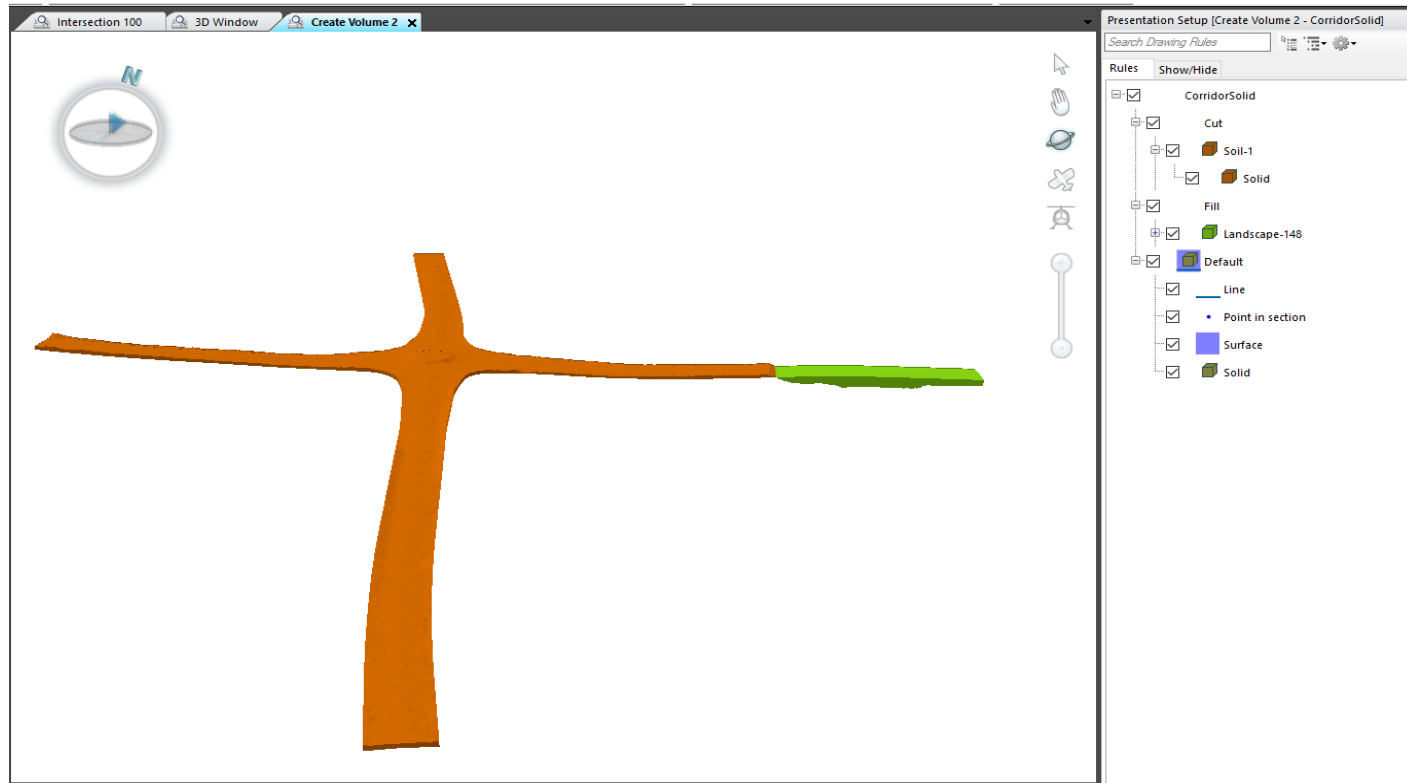
Generelt (General):

Navn	Intersection 100 Road 3-4
Beskrivelse	
Type	Veg
Opprettet dato	27.11.2018 13.06
Sist endret	30.11.2018 13.30
Deloppgave til	5011 ROAD UNDER DESIGN
Modell	Collaboration BIM Level 3
Sekvensnr.	0
Foregående oppg.	Ground Surface complete
Etterfølgende oppg.	
Versjon	2.0

Spesifikk (Specific):

Vegstandard	Norway (2013)
Dimensjoneringsklasse	H1
Tverrfall	Nei
Breddeutvidelse	Nei
Tool Tutorial	

3D kryssfunksjon – Steg 3 Mengder



3D kryssfunksjon – Steg 3 Mengder

The screenshot shows the Bentley software interface with the 'Table Intersection 100' task active. The 'Task' ribbon is visible, and the 'SpreadSheet' button is highlighted with a red box. A red arrow points from this button to an Excel spreadsheet window titled 'tmp7E6A.tmp.xlsx - Excel'. The spreadsheet displays a table of data with columns for Task, Feature Type Name, Count, Subgroup, Count Attribute, Value, and Unit. The data is organized into rows for different subgroups and their associated 3D, 2D, and Volume measurements.

Task	Feature Type Name	Count	Subgroup			Count Attribute	Value	Unit
Table Intersection 100	lagBeskrivelse.designation:	1	lagBeskrivelse.keyIdentifier:1.01	lagBeskrivelse.name:1.01	Materiale.materialNature:	Area 3D	6,610.633	m ²
						Area 2D	6,573.570	m ²
						Volume	384.774	m ³
	lagBeskrivelse.designation:Base course	1	lagBeskrivelse.keyIdentifier:1	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_1	Materiale.materialNature:Asphalt	Area 3D	6,579.775	m ²
						Area 2D	6,573.571	m ²
						Volume	657.353	m ³
lagBeskrivelse.designation:Base course	1	lagBeskrivelse.keyIdentifier:2	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_2	Materiale.materialNature:Asphalt	Area 3D	6,579.775	m ²	
					Area 2D	6,573.570	m ²	
					Volume	657.360	m ³	
lagBeskrivelse.designation:Base course	1	lagBeskrivelse.keyIdentifier:3	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_3	Materiale.materialNature:Asphalt	Area 3D	6,579.776	m ²	
					Area 2D	6,573.571	m ²	
					Volume	657.354	m ³	
lagBeskrivelse.designation:Base course	1	lagBeskrivelse.keyIdentifier:4	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_4	Materiale.materialNature:Asphalt	Area 3D	6,579.778	m ²	
					Area 2D	6,573.572	m ²	
					Volume	657.354	m ³	

3D kryssfunksjon – Steg 4 Stikningsdata

The screenshot displays a BIM software interface with the following elements:

- Top Ribbon:** Includes tabs for 'Hjem', 'Sett inn', 'Modellering', 'Bygging', 'Vis', 'Leveranse', and 'Oppgave'. A 'Importverktøy' (Import Tools) panel is active, showing options like 'Import', 'Konverteringsregler', 'Veiledning', 'Quadr1 G4', 'Hovedaktivitet', 'Struktur...', 'Samling', 'Egenskaper', 'Klassifisering', 'Prosjektregler', 'WMS', 'WMTS', 'Ortofoto', 'Trimble Quadri', 'Easy Access Map', 'Punktsky', 'Design', 'Civil 3D', and 'SketchUp (BETA)'.
- Explorer (Utforsker):** Shows a project tree with '100 LEVERANSE (2)' expanded. Two items are highlighted with a red box: 'Eksport stikningslinjer kryss 100' and 'Import Stikningslinjer Kryss.xml 1'. A red arrow points from this box to the 3D model.
- 3D View:** Displays a road intersection with red wireframe lines representing the cross-section data. A north arrow is visible in the top left of the 3D view area.

Ny kryssfunksjon

Begrensninger:

Man må gi inn vegbredde og skulder bredde for alle vegene

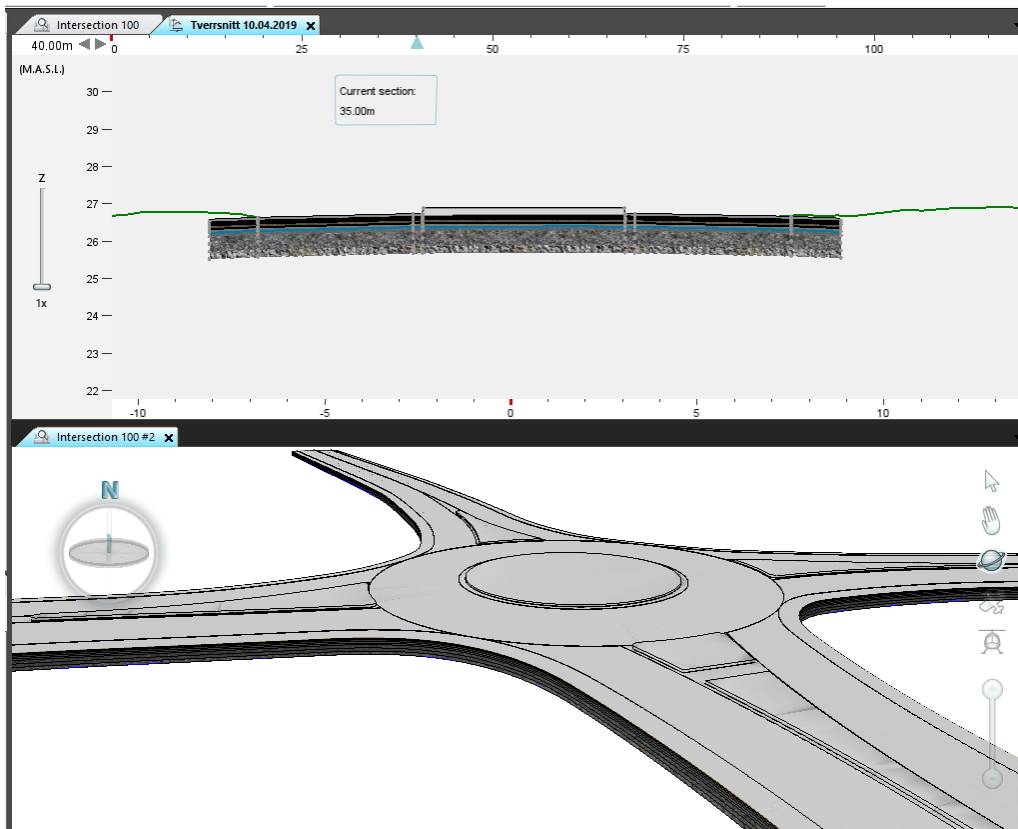
Skaper ikke solid objekter for skjæring/fylling

Støtter ikke lag i grunnen

Tilstøtende veger må tilpasses manuelt

Alt på engelsk foreløpig

Ny kryssfunksjon - DEMO





NETT·ERK