Create Your Local Design Rules and Content for InfraWorks 360

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Class summary

In this session we will have a look at how to create localized design rules for the design roads created with the roadway Design Module for InfraWorks 360 software. We will also look at how to localize the rules used for inspecting a drainage pipe network. And finally we will have an introduction in Project Kameleon preview, which enables you to create localized content for manholes and inlets for use with the drainage design module for InfraWorks 360 software and AutoCAD Civil 3D software.

Key learning objectives

At the end of this class, you will be able to:

- Create localized Roadway Design Rules in InfraWorks360
- Create localized content for pavement drainage in InfraWorks360
- Modify content for pavement drainage performance inspection

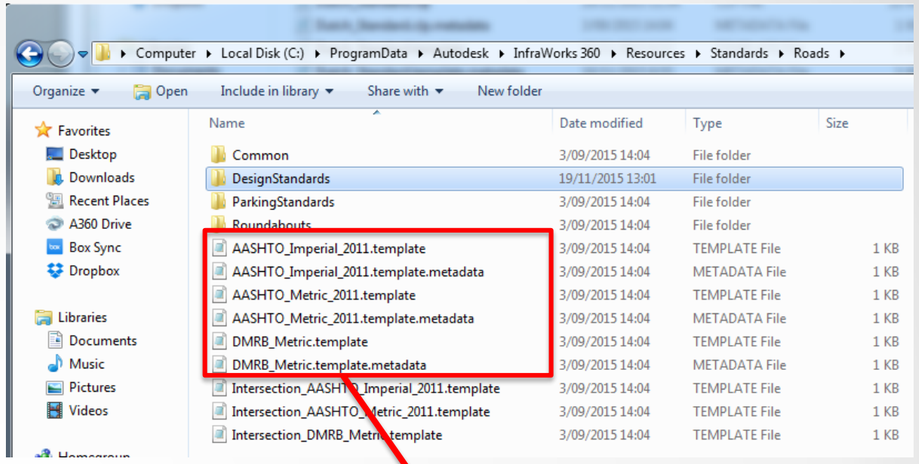
Localized Design Rules for InfraWorks 360

InfraWorks360 Roadway Design Rules

- Do you really need localized design rules
- Do I want to spend time creating/updating them

InfraWorks360 Roadway Design Rules

C:\ProgramData\Autodesk\InfraWorks 360\Resources\Standards\Roads



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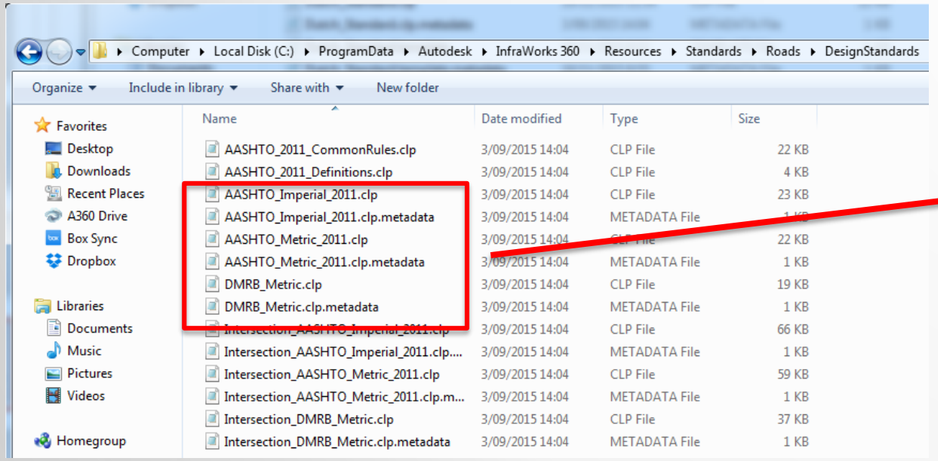
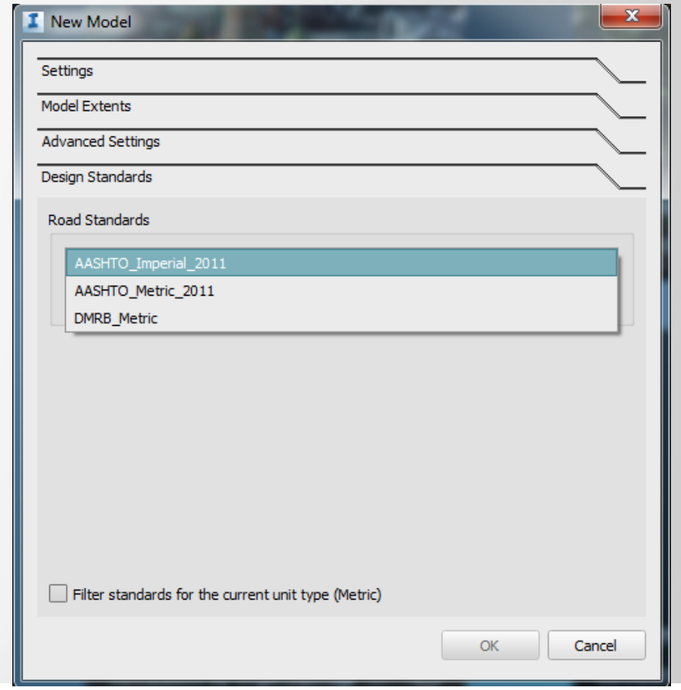
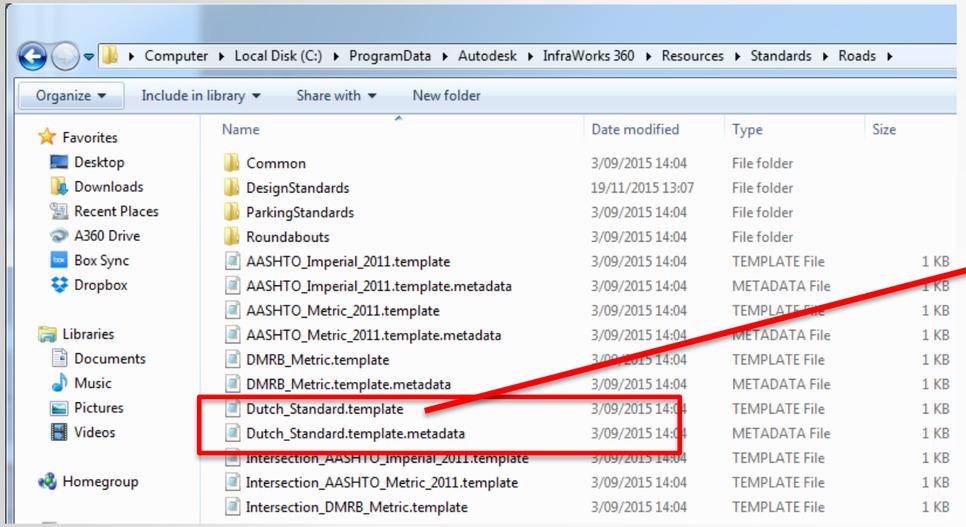
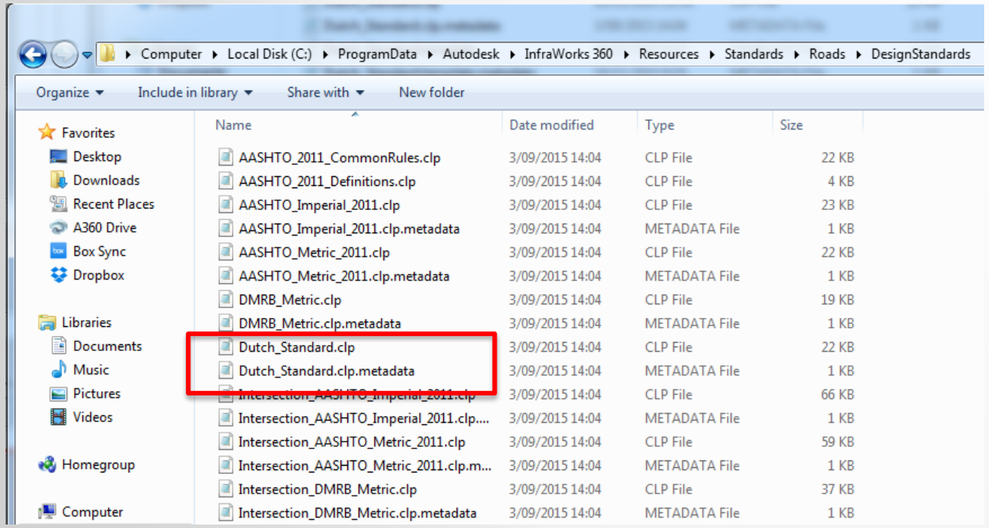
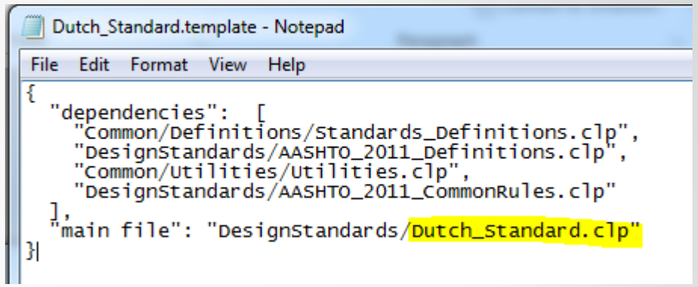


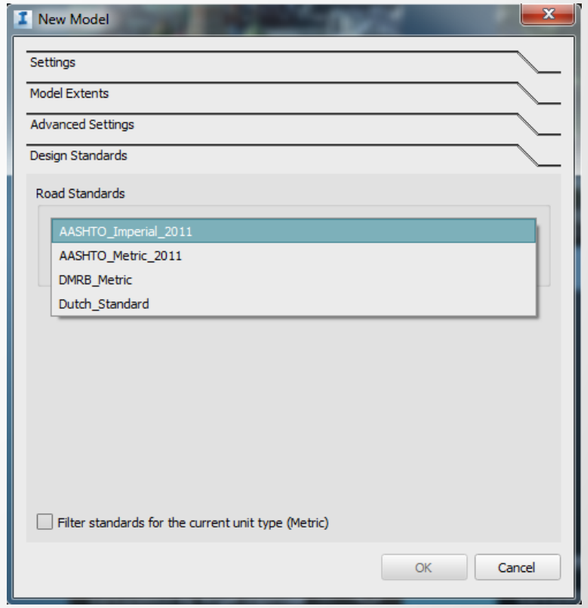


InfraWorks360 Roadway Design Rules







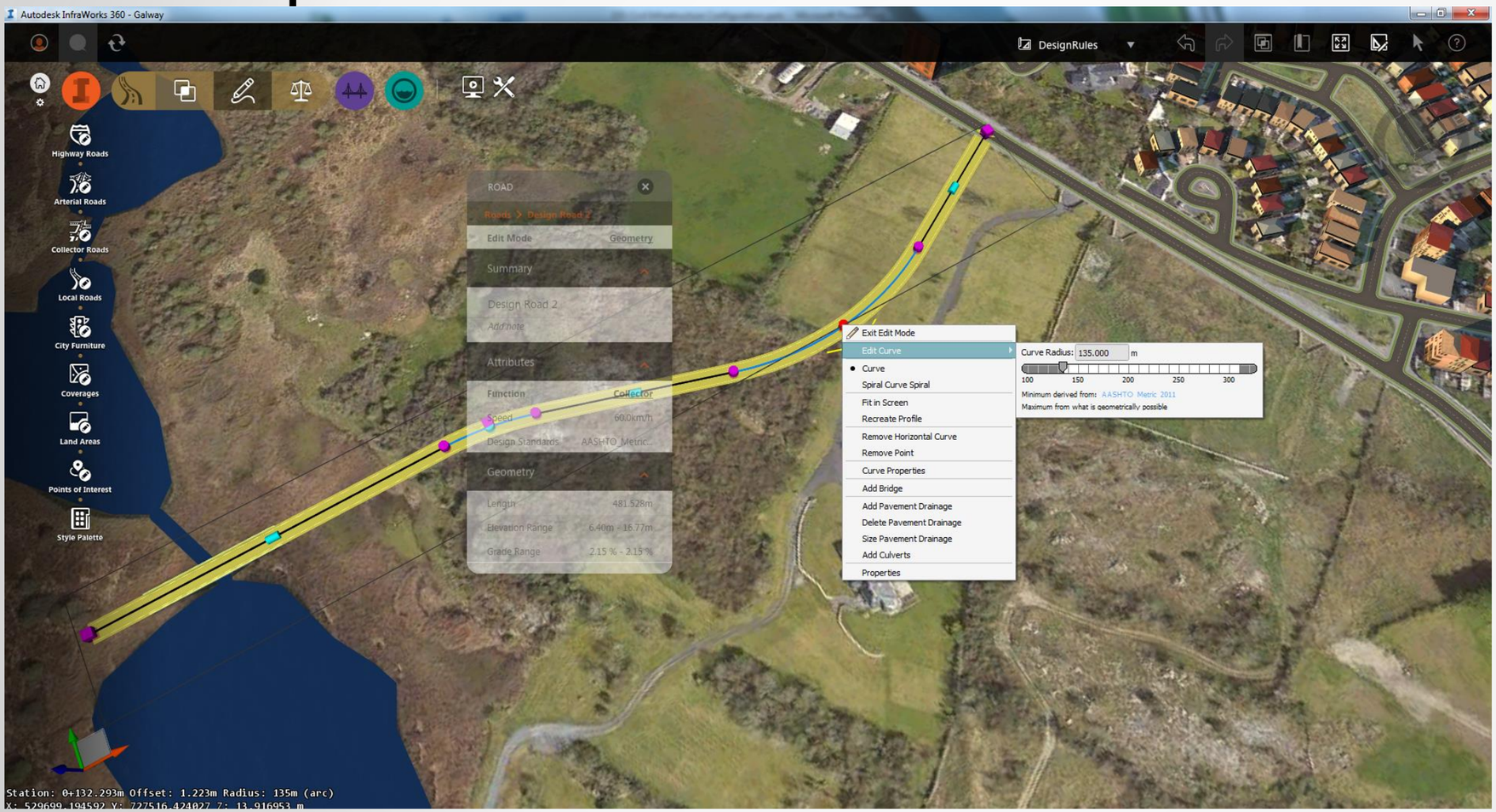


InfraWorks360 Roadway Design Rules

- File Naming
  - Do not start with special characters like “_” , “$”
  - First character should be in [A-G,a-g]
  - Numbers as first character are allowed

InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road



AASHTO Metric 2011

Collector road

Design speed 60 km/h

Min radius = 135 m

InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road

  - Dutch Standard
  - Collector road
  - Design speed 60 km/h
  - Min radius = 150 m

Tabel 8-11. Minimum boogstraal naar ontwerpsnelheid en verkantingen van +2,0%, +2,5% en +5%

V_0 (km/h)	R_h minimaal (m) +2,0%	+2,5%	+5%
90	410	400	350
80	305	295	260
70	215	210	185
60	150	145	130
50	100	96	85

InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road
  - Dutch_Standard.clp

Dutch_Standard.clp - Notepad

File Edit Format View Help

```
;=============================================================================
; Find default design speed
;=============================================================================
; Local road
(defrule find-speed-Local
    (declare (salience 100))
    ?inst <- (object (is-a StdRoad)
                     (function Local)
                     (default-design-speed ?speedx&:(eq ?speedx ?*Unavailable*)))
=>
    (modify-instance ?inst (default-design-speed 45.0))
)

; Collector
(defrule find-speed-Collector
    (declare (salience 100))
    ?inst <- (object (is-a StdRoad)
                     (function Collector)
                     (default-design-speed ?speedx&:(eq ?speedx ?*Unavailable*)))
=>
    (modify-instance ?inst (default-design-speed 60.0))
)

; Arterial road
(defrule find-speed-Arterial
    (declare (salience 100))
    ?inst <- (object (is-a StdRoad)
                     (function Arterial)
                     (default-design-speed ?speedx&:(eq ?speedx ?*Unavailable*)))
=>
    (modify-instance ?inst (default-design-speed 80.0))
)

; Freeway
(defrule find-speed-Freeway
    (declare (salience 100))
    ?inst <- (object (is-a StdRoad)
                     (function Freeway)
                     (default-design-speed ?speedx&:(eq ?speedx ?*Unavailable*)))
=>
    (modify-instance ?inst (default-design-speed 110.0))
)

;=============================================================================
; Find minimum radius (AASHTO 2011, pg. 3-31)
;=============================================================================
(defrule find-minimum-radius
    ?inst <- (object (is-a StdRoad)
                     (design-speed         ?speed&:(neq ?speed ?*Unavailable*))
                     (side-friction-factor ?side-friction&:(neq ?side-friction ?*Unavailable*))
                     (eMax                 ?eMax&:(neq ?eMax ?*Unavailable*))
                     (min-curve-radius     ?radius&:(eq ?radius ?*Unavailable*)))
=>
    (bind ?denom (* 127.0 (+ (* 0.01 ?eMax) ?side-friction)))
    (if (<> ?denom 0.0)
        then (modify-instance ?inst (min-curve-radius (/ (* ?speed ?speed) ?denom)))
    )
)
```

```
;=============================================================================
; Find minimum radius (AASHTO 2011, pg. 3-31)
;=============================================================================
(defrule find-minimum-radius
    ?inst <- (object (is-a StdRoad)
                     (design-speed         ?speed&:(neq ?speed ?*Unavailable*))
                     (side-friction-factor ?side-friction&:(neq ?side-friction ?*Unavailable*))
                     (eMax                 ?eMax&:(neq ?eMax ?*Unavailable*))
                     (min-curve-radius     ?radius&:(eq ?radius ?*Unavailable*)))
=>
    (bind ?denom (* 127.0 (+ (* 0.01 ?eMax) ?side-friction)))
    (if (<> ?denom 0.0)
        then (modify-instance ?inst (min-curve-radius (/ (* ?speed ?speed) ?denom)))
    )
)
```

Dutch_Standard.clp - Notepad

File Edit Format View Help

```
; ************************************************************************
; AASHTO tabular data for various information
; ************************************************************************
(definstances SpeedTables
    (of SpeedTable
        (design-speed             20.0)
        (side-friction-factor     0.176)
        (max-relative-gradient    0.80)
        (minimum-k-value-for-HSD  3)
        (minimum-k-value-for-SSD  1)
        (design-stopping-sight-distance 20.0)
        (no-control-intersection-sight-distance 20.0)
        (stop-intersection-left-turn-sight-distance 45.0)
        (stop-intersection-right-turn-sight-distance 40.0)
                (yield-intersection-left-or-right-turn-sight-distance 45.0)
                (yield-intersection-crossing-turn-minor-road-approach-length 20.0)
    )
    (of SpeedTable
        (design-speed             30.0)
        (side-friction-factor     0.17)
        (max-relative-gradient    0.75)
        (minimum-k-value-for-PSD  17.0)
        (minimum-k-value-for-HSD  6)
        (minimum-k-value-for-SSD  2)
        (design-stopping-sight-distance 35.0)
        (design-passing-sight-distance 120.0)
        (no-control-intersection-sight-distance 25.0)
        (stop-intersection-left-turn-sight-distance 65.0)
        (stop-intersection-right-turn-sight-distance 55.0)
                (yield-intersection-left-or-right-turn-sight-distance 70.0)
                (yield-intersection-crossing-turn-minor-road-approach-length 30.0)
    )
    (of SpeedTable
        (design-speed             40.0)
        (side-friction-factor     0.16)
        (max-relative-gradient    0.70)
        (minimum-k-value-for-PSD  23.0)
        (minimum-k-value-for-HSD  9)
        (minimum-k-value-for-SSD  4)
        (design-stopping-sight-distance 50.0)
        (design-passing-sight-distance 140.0)
        (no-control-intersection-sight-distance 35.0)
        (stop-intersection-left-turn-sight-distance 85.0)
        (stop-intersection-right-turn-sight-distance 75.0)
                (yield-intersection-left-or-right-turn-sight-distance 90.0)
                (yield-intersection-crossing-turn-minor-road-approach-length 40.0)
    )
    (of SpeedTable
        (design-speed             50.0)
        (side-friction-factor     0.16)
        (max-relative-gradient    0.65)
        (minimum-k-value-for-PSD  30.0)
        (minimum-k-value-for-HSD  13)
        (minimum-k-value-for-SSD  7)
        (design-stopping-sight-distance 65.0)
        (design-passing-sight-distance 160.0)
        (no-control-intersection-sight-distance 45.0)
```

InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road
  - AASHTO_2011_Definitions.clp

AASHTO_2011_Definitions.clp - Notepad

File Edit Format View Help

```
;---------------------------------------------------------------------------
;; Copyright 2015 Autodesk, Inc.  All rights reserved.
;; Use of this software is subject to the terms of the Autodesk license agreement
;; provided at the time of installation or download, or which otherwise accompanies
;; this software in either electronic or hard copy form.
;;

;---------------------------------------------------------------------------
; AASHTO Definitions
;---------------------------------------------------------------------------

; standards.roads.definitions.custom is imported in Utilities.clp
; Needed for speed table interpolation

(defmodule standards.roads.definitions.custom
    (import standards.roads.definitions ?ALL)
    (export ?ALL)
)

; derived class of Road
(defclass StdRoad
    (is-a Road)
    ; TODO: uncomment slot class when class is hooked up in IW
    ;(slot class     (type SYMBOL)    (allowed-symbols Urban Rural) (default Urban))
    (slot function  (type SYMBOL)    (allowed-symbols Arterial Local Collector Freeway) (default Freeway))
    (slot function-classification    (range 1 ?VARIABLE) (default ?*Unavailable*))
    ;(slot function-classification    (range 0 ?VARIABLE) (default 0))
    (slot eMax                       (range 0.0 12.0) (default 6.0))
    (slot min-spiral-length-for-curve-radius (default ?*Unavailable*))
    (slot side-friction-factor       (default ?*Unavailable*))
    (slot max-relative-gradient      (default ?*Unavailable*))
    (slot no-of-lanes-adj-factor     (default ?*Unavailable*))
)

; definition of design speed table
(defclass SpeedTable (is-a USER)
    (slot design-speed                                          (default ?*Unavailable*))
    (slot side-friction-factor                                  (default ?*Unavailable*))
    (slot max-relative-gradient                                 (default ?*Unavailable*))
    (slot minimum-k-value-for-HSD                               (default ?*Unavailable*))
    (slot minimum-k-value-for-PSD                               (default ?*Unavailable*))
    (slot minimum-k-value-for-SSD                               (default ?*Unavailable*))
    (slot design-stopping-sight-distance                        (default ?*Unavailable*))
    (slot design-passing-sight-distance                         (default ?*Unavailable*))
    (slot eighty-fifth-percentile-speed                         (default ?*Unavailable*))
    (slot design-minimum-passing-zone-length                    (default ?*Unavailable*))
    (slot no-control-intersection-sight-distance                (default ?*Unavailable*))
    (slot stop-intersection-left-turn-sight-distance            (default ?*Unavailable*))
    (slot stop-intersection-right-turn-sight-distance           (default ?*Unavailable*))
    (slot yield-intersection-left-or-right-turn-sight-distance  (default ?*Unavailable*))
    (slot yield-intersection-crossing-turn-minor-road-approach-length   (default ?*Unavailable*))
)
```

InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road

Dutch Standard	AASHTO_2011_Metric
R_h = Radius V_o = Design speed G = 9.81 m/s2 (acceleration of Gravity) F_z = side friction i = Superelevation (%) = E_{max} $R_h \geq \frac{\left(\frac{V_o}{3,6}\right)^2}{\left(f_z + \frac{i}{100}\right) g}$	(bind ?denom (* 127.0 (+ (* 0.01 ?eMax) ?side-friction))) (if (<> ?denom 0.0) then (modify-instance ?inst (min-curve-radius (/ (* ?speed ?speed) ?denom))))
=> V_o^2 / 127* (F_z +(i/100)) V_0(km/h) 50 60 70 80 90 f_z 0,180 0,169 0,157 0,146 0,134 (of SpeedTable (design-speed 60.0) (side-friction-factor 0.169) (max-relative-gradient 0.60) (minimum-k-value-for-PSD 38.0) (minimum-k-value-for-HSD 18) (minimum-k-value-for-SSD 11) (design-stopping-sight-distance 85.0) (design-passing-sight-distance 180.0) (no-control-intersection-sight-distance 55.0) (stop-intersection-left-turn-sight-distance 130.0) (stop-intersection-right-turn-sight-distance 110.0) (yield-intersection-left-or-right-turn-sight-distance 135.0) (yield-intersection-crossing-turn-minor-road-approach-length 65.0))	(of SpeedTable (design-speed 60.0) (side-friction-factor 0.15) (max-relative-gradient 0.60) (minimum-k-value-for-PSD 38.0) (minimum-k-value-for-HSD 18) (minimum-k-value-for-SSD 11) (design-stopping-sight-distance 85.0) (design-passing-sight-distance 180.0) (no-control-intersection-sight-distance 55.0) (stop-intersection-left-turn-sight-distance 130.0) (stop-intersection-right-turn-sight-distance 110.0) (yield-intersection-left-or-right-turn-sight-distance 135.0) (yield-intersection-crossing-turn-minor-road-approach-length 65.0))

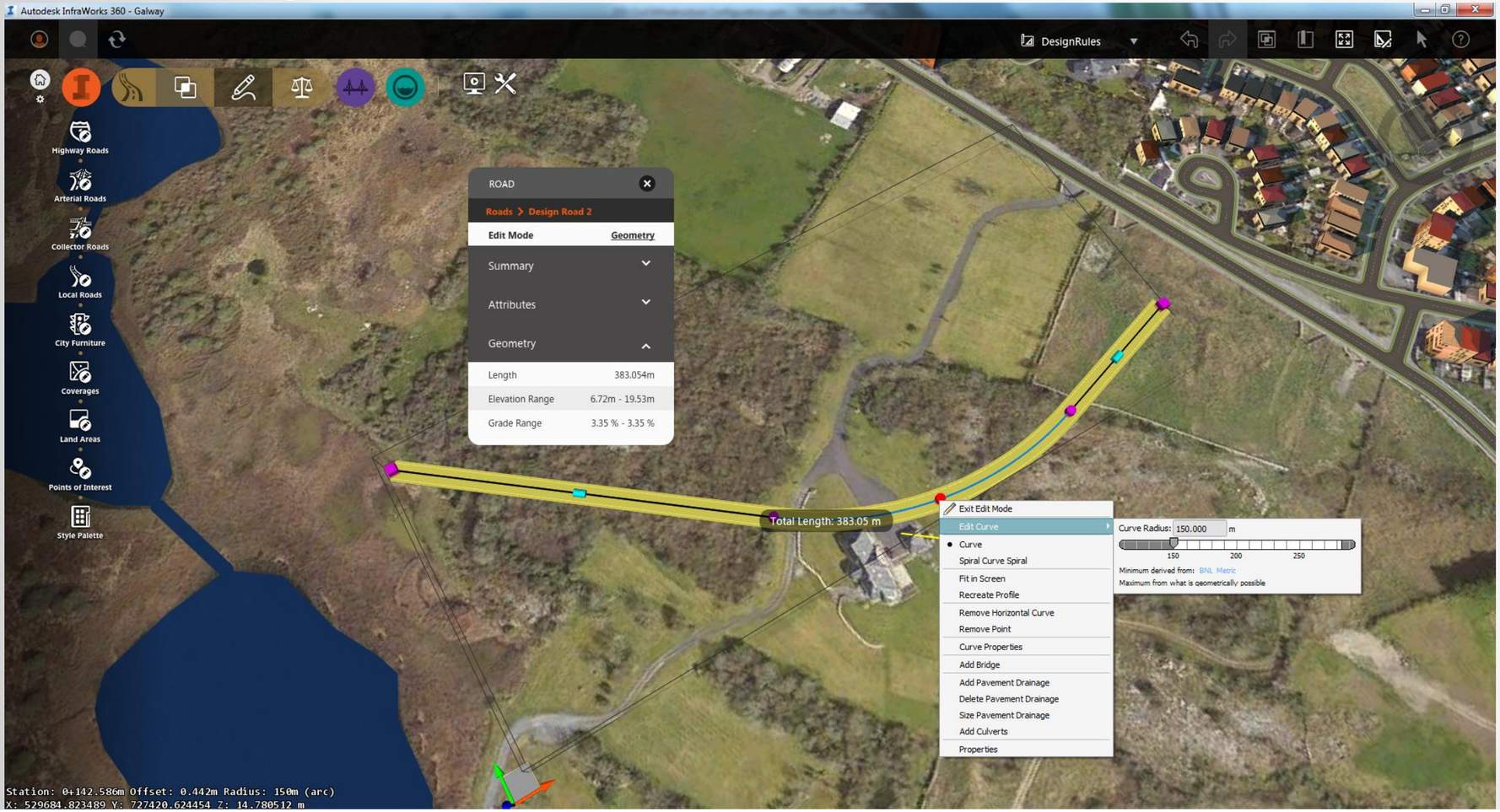
InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road

Dutch Standard	AASHTO_2011_Metric
(bind ?denom (* 127.0 (+ (* 0.01 5.0) ?side-friction))) (if (<> ?denom 0.0) then (modify-instance ?inst (min-curve-radius (/ (* ?speed ?speed) ?denom))))	(bind ?denom (* 127.0 (+ (* 0.01 ?eMax) ?side-friction))) (if (<> ?denom 0.0) then (modify-instance ?inst (min-curve-radius (/ (* ?speed ?speed) ?denom))))

InfraWorks360 Roadway Design Rules

- Example1: Minimum Radius for Collector Road



Dutch Standard

Collector road

Design speed 60 km/h

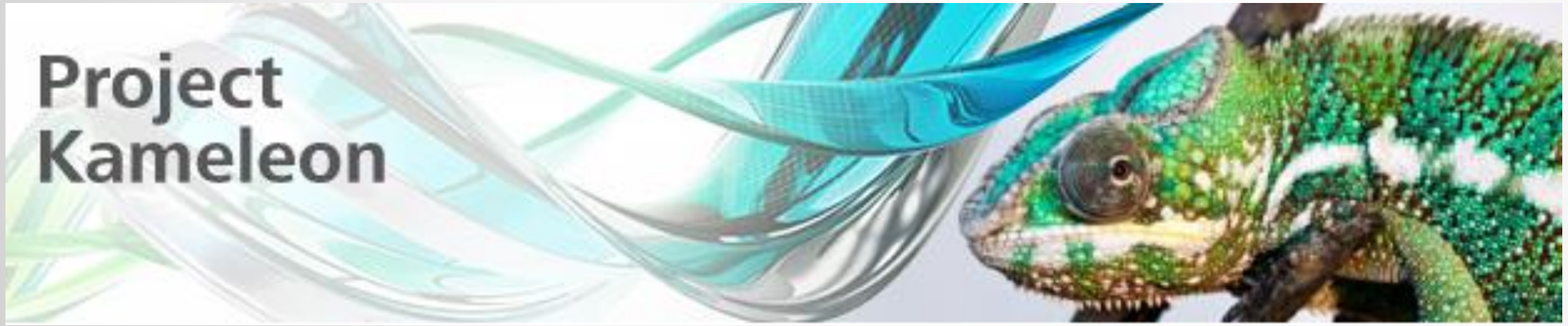
Min radius = 150 m

InfraWorks360 Roadway Design Rules

- Example2: Minimum Spiral length for Highways

See handout for full description of the workflow

Localized content for Pavement Drainage in InfraWorks 360



Project Kameleon

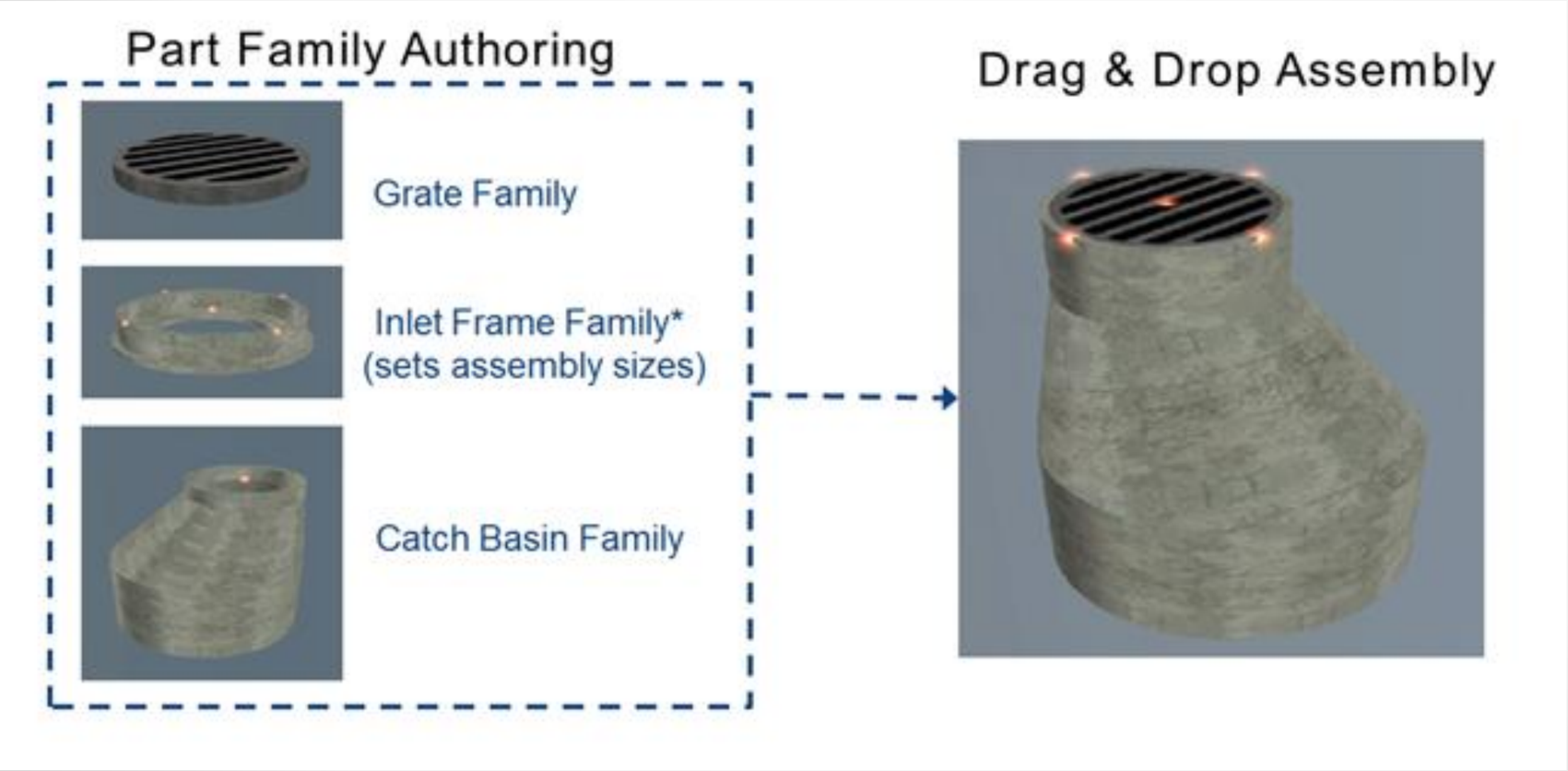
- Labs Project
- Version 3 expired November 16
- Version 4 released November 25th

Project Kameleon

- Inlet/manhole (catalog) authoring tool
- Content to be used in InfraWork360 AND Civil 3D
- Parts Editor + Shape Modeler

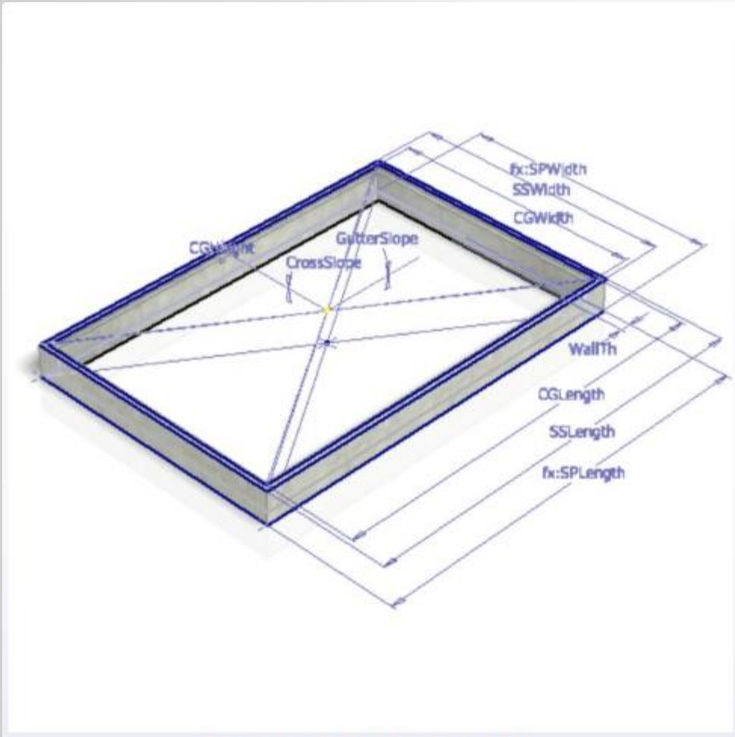
Project Kameleon

- Parts Editor



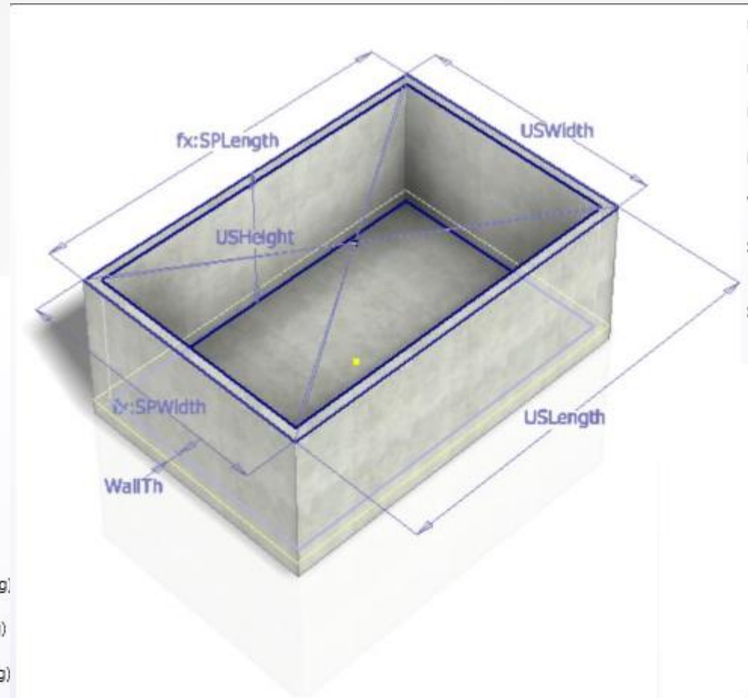
Project Kameleon

- Parts Editor



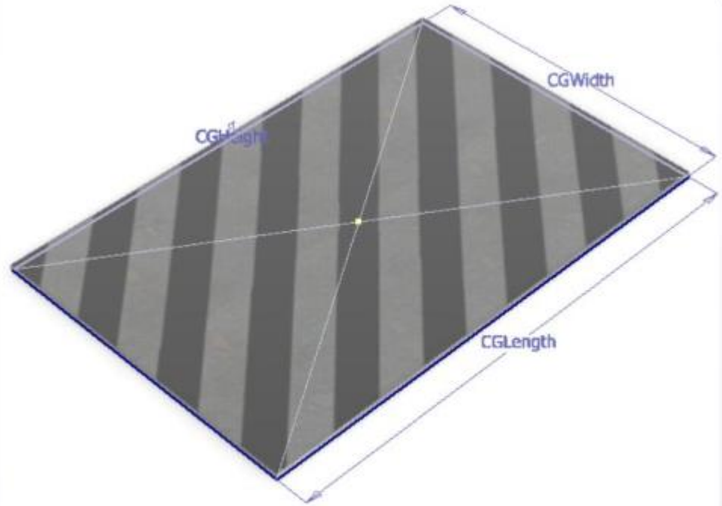
GutterSlope
Roadway Gutter Slope
CrossSlope
Roadway Cross Slope
SSLength
Length of Inlet
SSWidth
Width of Inlet
SSHeight
Height of Inlet
WallTh
Wall thickness of Inlet
CGLength
Length of grate (opening)
CGWidth
Width of grate (opening)
CGHeight
Height of grate (opening)
SPLength
Underground Structure P
SSLength
SPWidth
Underground Structure P
SSWidth

Inlet - Grate - (Rectangular - Rectangular)
53e69f31-421f-4a1b-8408-81bc5d07f9b7



USLength
Total Length of Structure
USWidth
Total Width of Structure
USHeight
Height of Catchment Structure
BaseTh
Base thickness of Catchment S
WallTh
Wall thickness of Catchment S
SPLength
Structure Port Length
USLength
SPWidth
Structure Port Width
USWidth

Catchment Structure (Rectangular)
bb4be74e-be5c-4352-93b3-0ed9b17fd216



CGLength
Length of grate
CGWidth
Width of grate
CGHeight
Height of grate

Grate - Rectangular Design
0675c93a-d8de-4eb7-a54f-fe90d98b9c9c

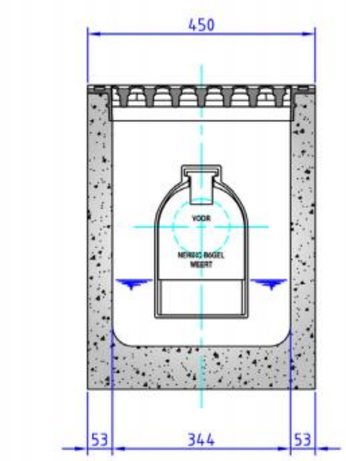
Project Kameleon

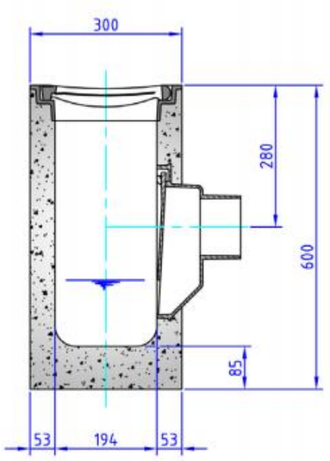
- Parts Editor Workflow
  - Assemble parts
  - Validate parts
  - Publish parts
  - Convert part for use in Civil 3D

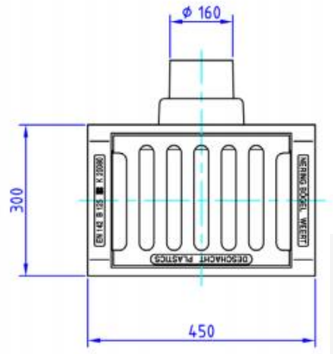
  - Use part in Infraworks 360 and/or Civil 3D

Project Kameleon

- Parts Editor Example



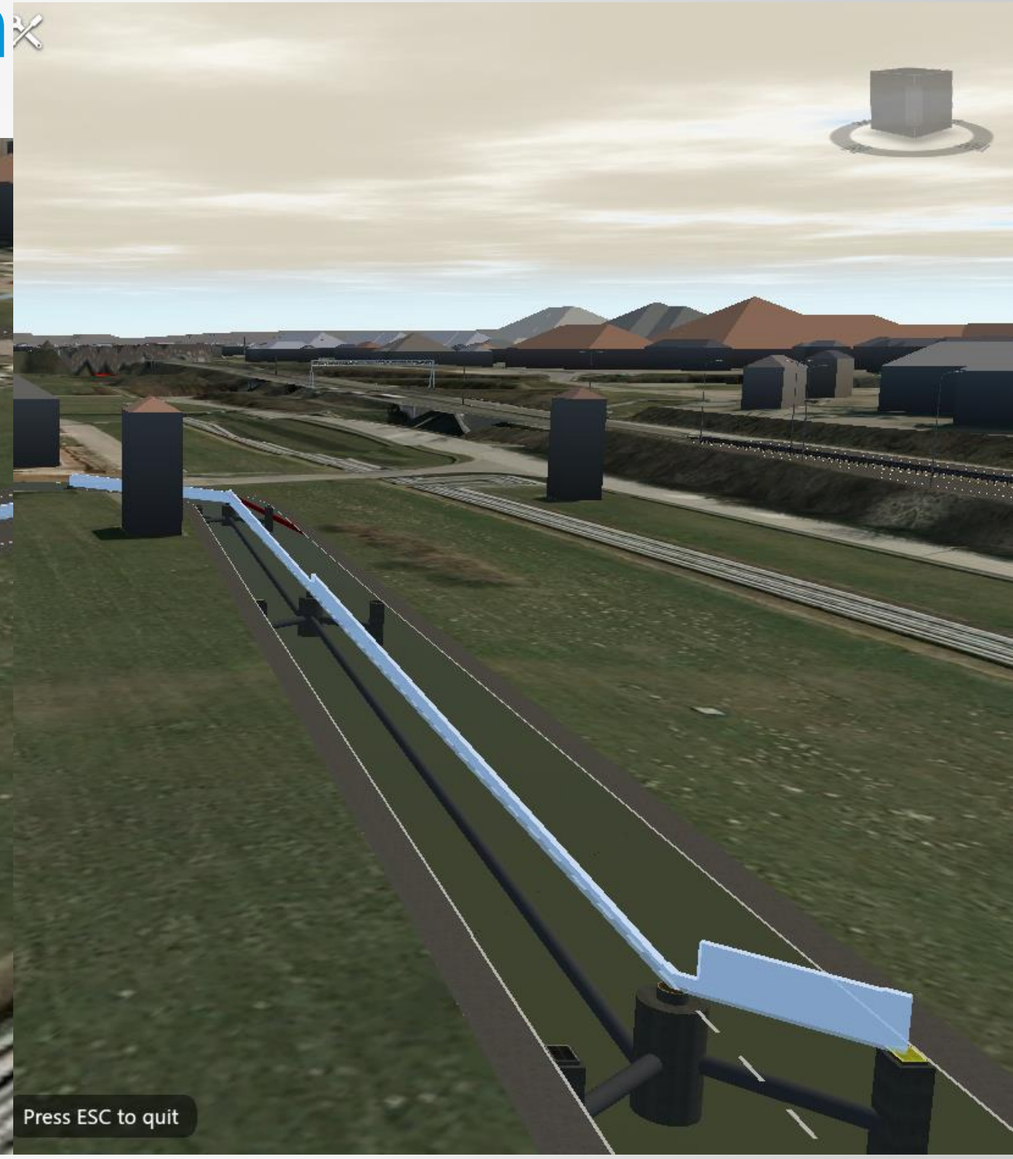




S 1300/60 GB1	450x300	600	7	B	125/160	A / L / R	Eendelig	Beton/GY	KOMO NL BSB
S 1300/80 GB1	450x300	800	7	B	125/160	A / L / R	Eendelig	Beton/GY	KOMO NL BSB

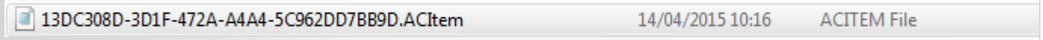
Localized Drainage Rules for InfraWorks 360

Drainage Performance Inspection



Drainage Design Rules – local content creation InfraWorks

- Stored in a ACItem file



- C:\ProgramData\Autodesk\InfraWorks 360\Resources\LocalLibrary\Rules\DrainageDesign\Rainfall\IDF


```
{
    "GlobalName": "Intensity_Duration_Frequency_RainFall_Equation",
    "LocalName": "Intensity_Duration_Frequency_RainFall_Equation",
    "LocalDescription": null,
    "Uri": "/Rules/DrainageDesign/Rainfall/IDF/13DC308D-3D1F-472A-A4A4-5C962DD7BB9D.ACItem",
    "GalleryImage": null,
    "ContentDomain": "DrainageDesign",
    "ContentType": "Rules",
    "CompatibleStandard": "British",
    "Keywords": [
        "Undefined"
    ],
    "AciSchemaVersion": "0.1",
    "References": [],
    "EmbeddedData": {
        "ReturnPeriodYearEquationAsBDE":
        {
            "EquationName": "BDE",
            "PeriodCoefficient":
            [
                {
                    "ReturnPeriod": 1,
                    "Bcoefficient": 35.254,
                    "Dcoefficient": 7,
                    "Ecoefficient": 0.652
                },
                {
                    "ReturnPeriod": 2,
                    "Bcoefficient": 37.295,
                    "Dcoefficient": 7.4,
                    "Ecoefficient": 0.642
                },
                {
                    "ReturnPeriod": 3,
                    "Bcoefficient": 37.385,
                    "Dcoefficient": 7.1,
                    "Ecoefficient": 0.628
                },
                {
                    "ReturnPeriod": 5,
                    "Bcoefficient": 39.455,
                    "Dcoefficient": 8,
                    "Ecoefficient": 0.617
                },
                {
                    "ReturnPeriod": 10,
                    "Bcoefficient": 4,
                    "Dcoefficient": 8.7,
                    "Ecoefficient": 0.606

                },
                {
                    "ReturnPeriod": 25,
                    "Bcoefficient": 49.567,
                    "Dcoefficient": 9.7,
                    "Ecoefficient": 0.622
                },
                {
```

Drainage Design Rules – local content creation InfraWorks

- Only BDE equation is used

The rainfall IDF values are described by the equation:

$$i = \frac{B}{(t_c + D)^E}$$

Where:

i = Intensity, inches per hour (in/hr)
t_c = Time of concentration, minutes (min)

- Other equations are for future use


```
{
    "GlobalName": "Intensity_Duration_Frequency_RainFall_Equation",
    "LocalName": "Intensity_Duration_Frequency_RainFall_Equation",
    "LocalDescription": null,
    "Uri": "/Rules/DrainageDesign/Rainfall/IDF/13DC308D-3D1F-472A-A4A4-5C962DD7BB9D.ACItem",
    "GalleryImage": null,
    "ContentDomain": "DrainageDesign",
    "ContentType": "Rules",
    "CompatibleStandard": "British",
    "Keywords": [
        "Undefined"
    ],
    "AciSchemaVersion": "0.1",
    "References": [],
    "EmbeddedData": {
        "ReturnPeriodYearEquationAsBDE":
        {
            "EquationName": "BDE",
            "PeriodCoefficient":
            [
                {
                    "ReturnPeriod": 1,
                    "Bcoefficient": 35.254,
                    "Dcoefficient": 7,
                    "Ecoefficient": 0.652
                },
                {
                    "ReturnPeriod": 2,
                    "Bcoefficient": 37.295,
                    "Dcoefficient": 7.4,
                    "Ecoefficient": 0.642
                },
                {
                    "ReturnPeriod": 3,
                    "Bcoefficient": 37.385,
                    "Dcoefficient": 7.1,
                    "Ecoefficient": 0.628
                },
                {
                    "ReturnPeriod": 5,
                    "Bcoefficient": 39.455,
                    "Dcoefficient": 8,
                    "Ecoefficient": 0.617
                },
                {
                    "ReturnPeriod": 10,
                    "Bcoefficient": 4,
                    "Dcoefficient": 8.7,
                    "Ecoefficient": 0.606

                },
                {
                    "ReturnPeriod": 25,
                    "Bcoefficient": 49.567,
                    "Dcoefficient": 9.7,
                    "Ecoefficient": 0.622
                },
                {
```

Drainage Design Rules – local content creation InfraWorks

The rainfall IDF values are described by the equation:

$$i = \frac{B}{(t_c + D)^E}$$

Where:

i	=	Intensity, inches per hour (in/hr)
t_c	=	Time of concentration, minutes (min)

- What B, D and E values are being used?
- What tc is being used?

- C:\ProgramData\Autodesk\InfraWorks360\Resources\Standards\Drainage\Common\Rules\InletAnalysis_Rules.clp

```
; ---------------------------------------------------------------------------
; Main Module
; ---------------------------------------------------------------------------
(defmodule MAIN
    (import standards.drainage.common.definitions.inletanalysis ?ALL)
    (export ?ALL)
)

(defrule initialize
=>
    (focus MAIN)
)

; ---------------------------------------------------------------------------
; ARI (annual recurrence interval)
(defrule find-ari
    ?inst <- (object (is-a ARI)(road_type ?rt))
=>
    (modify-instance ?inst (ari  10.0)
                           (resolved TRUE))
)

; ---------------------------------------------------------------------------
(defrule find-rainfall-intensity
    ?inst <- (object (is-a RainfallIntensity)(ari ?ar))
=>
    (modify-instance ?inst (intensity  7.5)
                           (resolved TRUE))
)

; ---------------------------------------------------------------------------
(defrule find-toc
    ?inst <- (object (is-a ToC)(material ?ma))
=>
    (modify-instance ?inst (toc  5.0)
                           (resolved TRUE))
)

; ---------------------------------------------------------------------------
(defrule find-runoff-coefficient
    ?inst <- (object (is-a RunoffCoefficient)(material ?ma))
=>
    (modify-instance ?inst (coefficient  0.95)
                           (resolved TRUE))
)

; ---------------------------------------------------------------------------
(defrule find-manning-coefficient
    ?inst <- (object (is-a ManningCoefficient)(material ?ma))
=>
    (modify-instance ?inst (coefficient  0.016)
                           (resolved TRUE))
)
```

Drainage Design Rules – local content creation InfraWorks

Original file


```
"LocalDescription": null,
"Uri": "/Rules/DrainageDesign/Rainfall/IDF/13DC308D-3D1F-472A-A4A4-5C962DD7BB9D.ACItem",
"GalleryImage": null,
"ContentDomain": "DrainageDesign",
"ContentType": "Rules",
"CompatibleStandard": "British",
"Keywords": [
    "Undefined"
],
"AciSchemaVersion": "0.1",
"References": [],
"EmbeddedData": {
    "ReturnPeriodYearEquationAsBDE":
    {
        "EquationName": "BDE",
        "PeriodCoefficient":
        [
            {
                "ReturnPeriod": 1,
                "Bcoefficient": 35.254,
                "Dcoefficient": 7,
                "Ecoefficient": 0.652
            },
            {
                "ReturnPeriod": 2,
                "Bcoefficient": 37.295,
                "Dcoefficient": 7.4,
                "Ecoefficient": 0.642
            },
            {
                "ReturnPeriod": 3,
                "Bcoefficient": 37.385,
                "Dcoefficient": 7.1,
                "Ecoefficient": 0.628
            },
            {
                "ReturnPeriod": 5,
                "Bcoefficient": 39.455,
                "Dcoefficient": 8,
                "Ecoefficient": 0.617
            },
            {
                "ReturnPeriod": 10,
                "Bcoefficient": 41.834,
                "Dcoefficient": 8.7,
                "Ecoefficient": 0.606
```


Modified file


```
"LocalName": "Intensity_Duration_Frequency_Rainfall_Equation",
"LocalDescription": null,
"Uri": "/Rules/DrainageDesign/Rainfall/IDF/13DC308D-3D1F-472A-A4A4-5C962DD7BB9D.ACItem",
"GalleryImage": null,
"ContentDomain": "DrainageDesign",
"ContentType": "Rules",
"CompatibleStandard": "British",
"Keywords": [
    "Undefined"
],
"AciSchemaVersion": "0.1",
"References": [],
"EmbeddedData": {
    "ReturnPeriodYearEquationAsBDE":
    {
        "EquationName": "BDE",
        "PeriodCoefficient":
        [
            {
                "ReturnPeriod": 1,
                "Bcoefficient": 35.254,
                "Dcoefficient": 7,
                "Ecoefficient": 0.652
            },
            {
                "ReturnPeriod": 2,
                "Bcoefficient": 37.295,
                "Dcoefficient": 7.4,
                "Ecoefficient": 0.642
            },
            {
                "ReturnPeriod": 3,
                "Bcoefficient": 37.385,
                "Dcoefficient": 7.1,
                "Ecoefficient": 0.628
            },
            {
                "ReturnPeriod": 5,
                "Bcoefficient": 39.455,
                "Dcoefficient": 8,
                "Ecoefficient": 0.617
            },
            {
                "ReturnPeriod": 10,
                "Bcoefficient": 4,
                "Dcoefficient": 8.7,
                "Ecoefficient": 0.606
```

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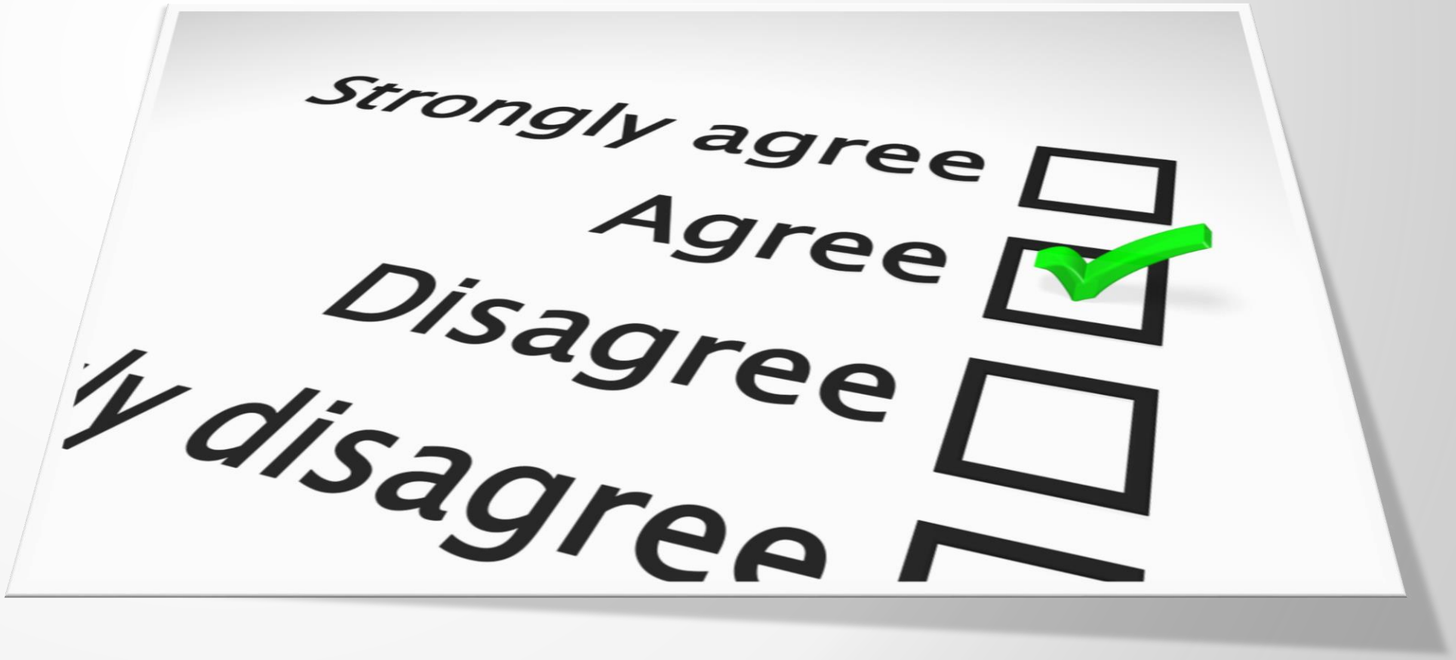

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