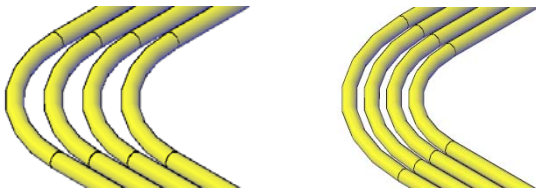


Defining Variable Radius Conduit Elbows in AutoCAD MEP

This document describes how to modify the EMT bent conduit fitting to allow for variable radius conduit bends.

Problem

You want to be able to route conduit with varying radius elbow bends. However, when placing conduit using AutoCAD MEP, all bends are the same radius.



The image on the left is what you are currently getting. The image on the right represents what you want to achieve.

As a specific example, we'll take a look at the 'Electrical Metallic Tube' (EMT) 'Bent Conduit EMT Set Screw US Imperial' fitting. From the ConduitFittingAdd window, you want to have the ability to modify the R1 value.

Property Name	Value
Catalog Entry	
Connections	
Connection Typ...	Set Screw
Diameter D1	4"
Connection Typ...	Set Screw
Geometry	
Elbow Angle A1	90.00

However, on the Part Filter tab, there is no such Parameter.

Solution

Using the AutoCAD MEP Catalog Editor, you can modify the definition of the conduit bend to allow you to specify the bend radius, R1.

Command: LAUNCHCATALOGEDITOR

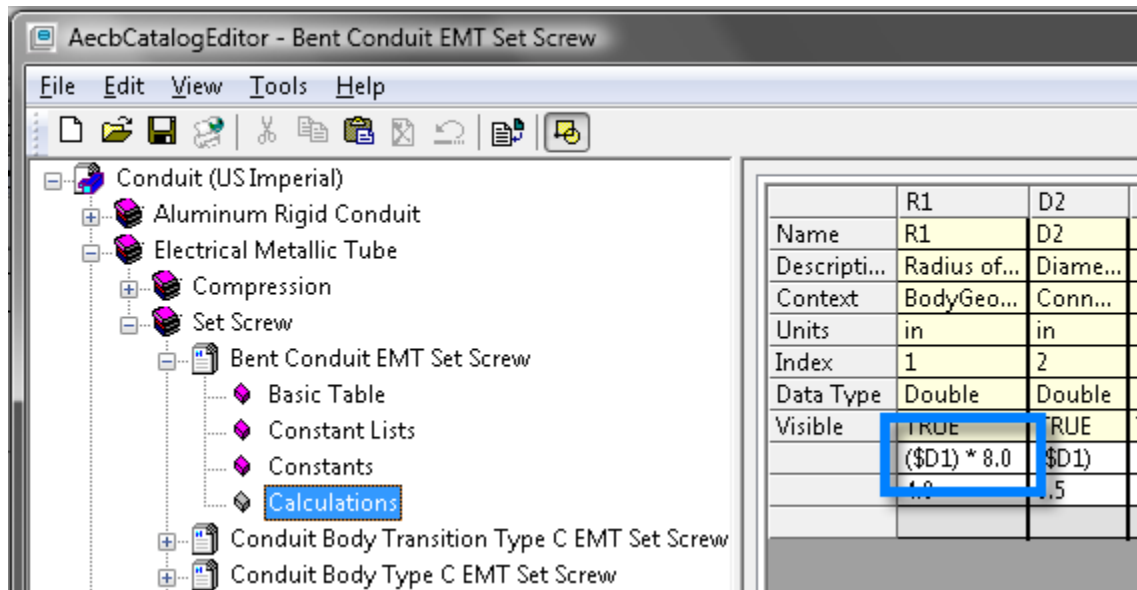
From the File menu, select Open, and browse to find your Conduit catalog:

C:\ProgramData\Autodesk\ACD-MEP 2009\enu\Aecb Catalogs\US Imperial\Conduit\Conduit (US Imperial).apc

Note: The path above represents the default location on Windows Vista. The location on your machine may be different.

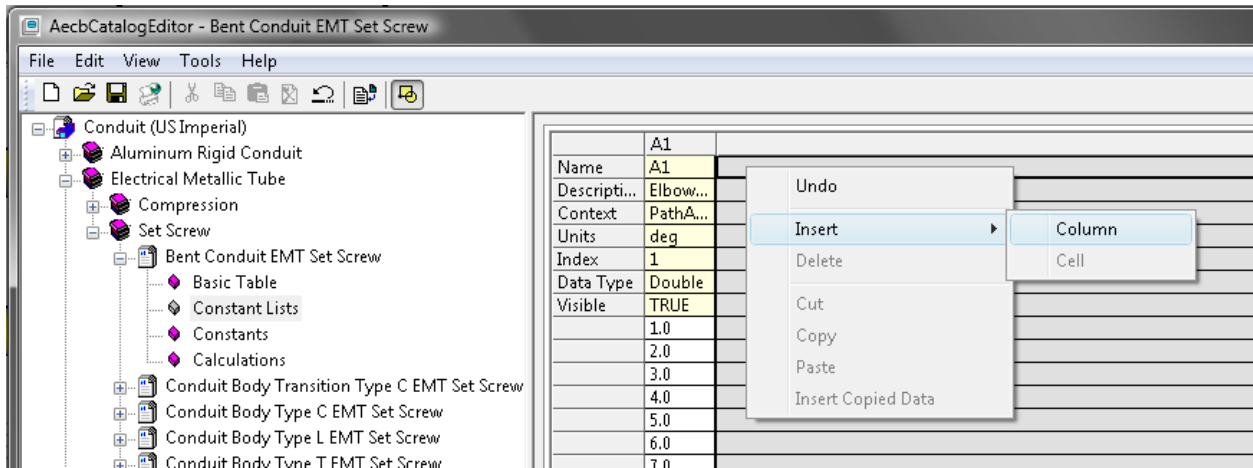
In the Catalog Editor, browse the Conduit (US Imperial) Catalog to find Electrical Metallic Tube > Set Screw > Bent Conduit EMT Set Screw > Calculations.

The definition of the part indicates that the R1 value is based on a Calculation. The formula $(\$D1) * 8.0$ results in a bend radius of 8x the conduit nominal diameter.



Since the conduit bend radius is a function of external dependencies – that is, the radius of a particular bend is dependent on the bend of the adjacent bend – we will simply provide the user a manual means to set the radius.

On the left side of the Catalog Editor, select the Constant Lists node under Bent Conduit EMT Set Screw. Right click in the right side of the Catalog Editor, and select Insert > Column.



This will insert a column adjacent to the A1 column as shown below:

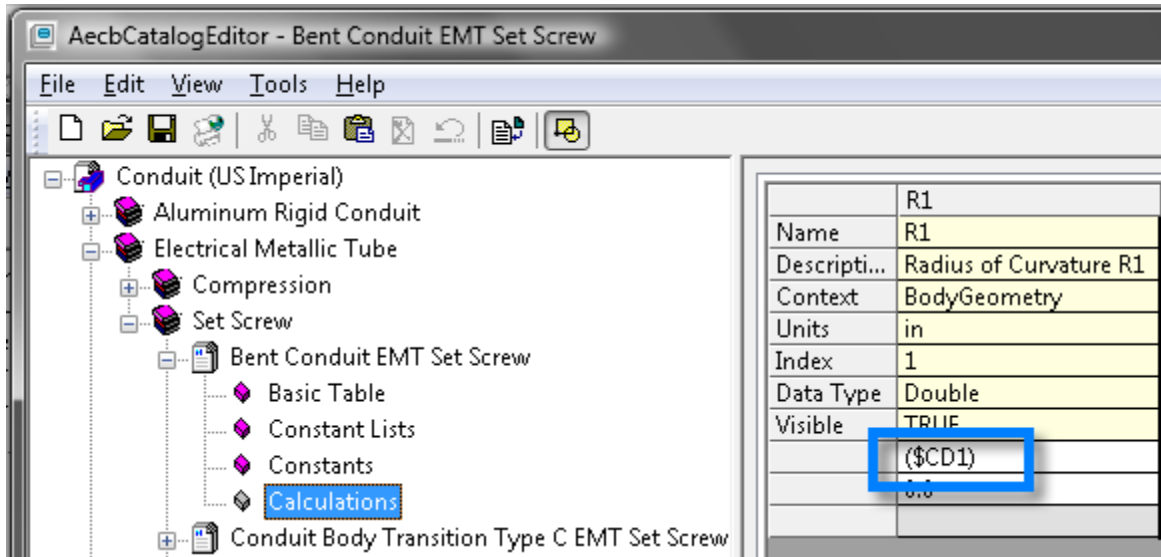
	A1	CD1
Name	A1	CD1
Descripti...	Elbow...	Custom Data 1
Context	PathA...	CustomData
Units	deg	
Index	1	1
Data Type	Double	String
Visible	TRUE	FALSE
	1.0	

Modify the Description, Data Type, Visible, and value as shown below:

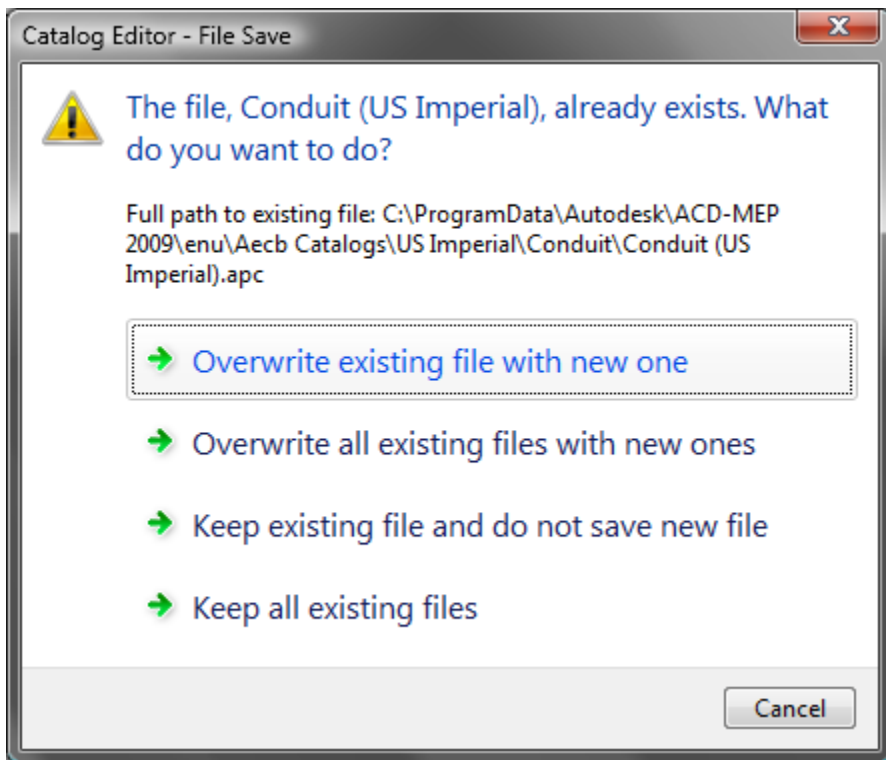
	A1	CD1
Name	A1	CD1
Descripti...	Elbow...	User Defined Radius R1
Context	PathA...	CustomData
Units	deg	
Index	1	1
Data Type	Double	Double
Visible	TRUE	TRUE
	1.0	12.0
	2.0	

1. Set Description to 'User Defined Radius R1'
2. Set Data Type to Double
3. Set Visible to TRUE
4. Set the default value to 12

Back under the Calculations node, set the formula for R1 to (\$CD1).

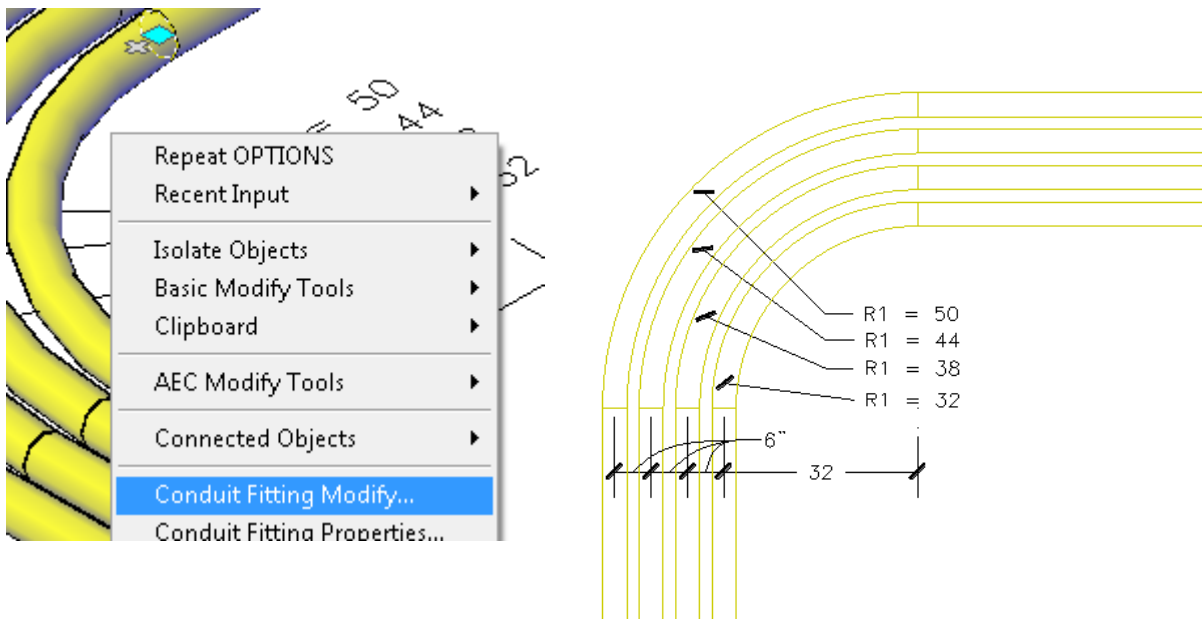
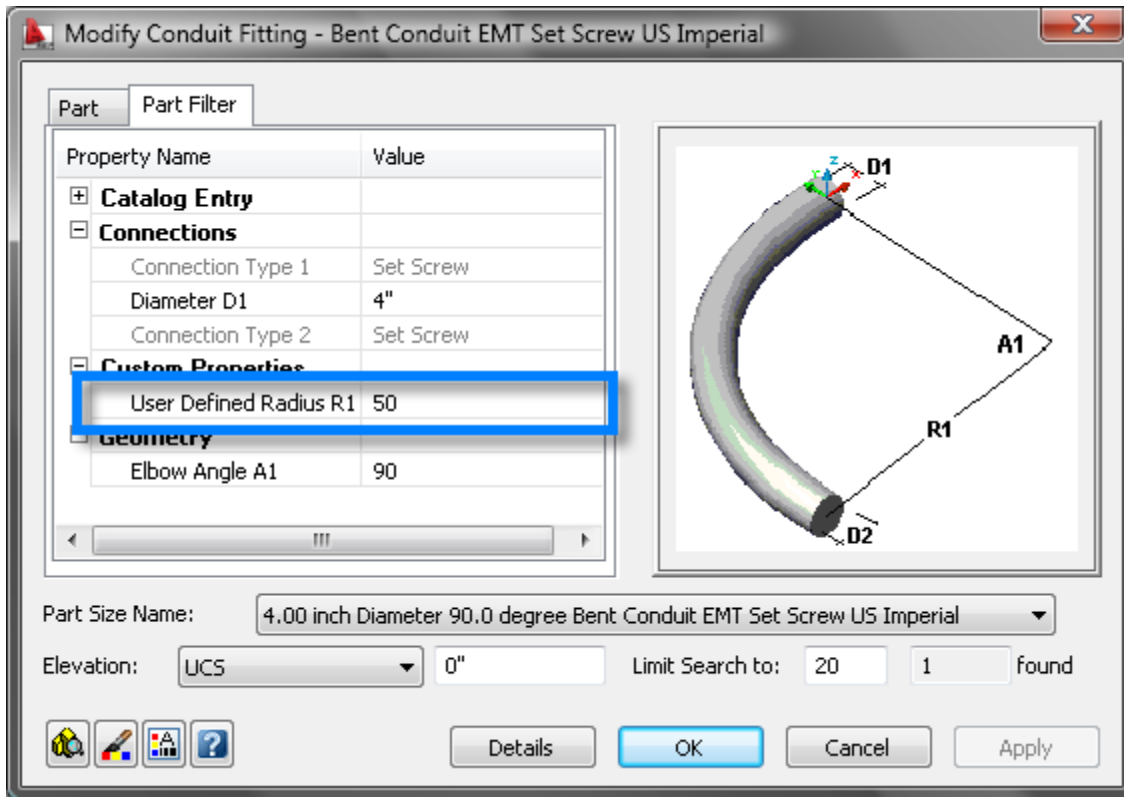


Now, we need to save changes. From the File menu, select Save. Then, click File > Exit, and select the 'Overwrite existing file with new one' option.



Using the Modified Bend

Now, when you place or modify (ConduitFittingModify) an EMT Conduit Bend, you will have a Custom Property called 'User Defined Radius' that you may use to specify the conduit bend radius.



If you wish to have variable radius conduit elbows for other conduit types, such as EMT compression or IMC threaded, you will need to go through this same exercise for those other conduit bend fitting types.