

Flow of Events for Use Case – Define Services Access

Change Log	
17/10/2004	Renamed from UC-DefineServicesAccess Subflow for unspecified access added
01/11/2004	Finalized for pre-integrated model

Overview

Defines and locates the means of gaining access to relevant points on distribution services for the purposes of inspection and maintenance.

Access points are generally required at locations where:

- Problems may be envisaged as occurring (change of size, change of material, junctions etc.)
- Access to flow control is required (valves, meters etc.)

Process

Preconditions

- Terrain must be specified
- Constructions must be defined and located
- Road layout must be defined and located
- Existing and proposed services must be defined and located

Actors

Applicant

Main Flow

1. Determine the system of interest.
 - If defining an access point without being specific as to its type or nature then <S1>
 - If defining access at change of diameter, gradient, material or at junction or change of flow direction then. <S2>
 - If defining access to isolating valves and flow meters then <S3>

Subflows

S1: Provide Unspecified Access

Flow	Entity
1. Determine the point at which the access is to be provided (this will usually be along the line of a distribution system or at a junction in a system)	
2. Locate an instance of IfcDistributionChamberElement of an appropriate IfcDistributionChamberElementType.	IfcDistributionChamberElementType IfcDistributionChamberElement
3. Attach an instance of an appropriate property set (Pset_DistributionChamberElementTypeXXX) with relevant properties asserted.	Pset_DistributionChamberElementTypeXXX

S2: Provide Access at Change of Diameter, Gradient, Material or at Junction or Change of Flow Direction

Flow	Entity
1. Determine the elements that are contained within the system using IfcRelAssignsToGroup	IfcRelAssignsToGroup
2. Filter from the group only instances of IfcFlowSegment that are typed as pipe segments.	IfcFlowSegment
3. Filter from the elements contained in the system the instances of IfcDistributionPort.	IfcDistributionPort
4. Traverse the system to determine the order of connection between segments, fittings etc by testing paired instances of IfcDistributionPort through IfcRelConnects.	IfcDistributionPort IfcRelConnects
5. During the traverse, progressively store the size, gradient and material of each instance of IfcFlowSegment as below:	IfcFlowSegment
6. Test the size of each instance of IfcFlowSegment from the property set Pset_PipeSegmentTypeCommon → NominalDiameter that is defined for the segment though IfcRelDefinesByProperties.	IfcFlowSegment Pset_PipeSegmentTypeCommon → NominalDiameter IfcRelDefinesByProperties
7. Test the gradient of each instance of IfcFlowSegment from the property set Pset_FlowSegmentPipeSegment → Gradient that is defined for the segment though IfcRelDefinesByProperties.	IfcFlowSegment Pset_FlowSegmentPipeSegment → Gradient IfcRelDefinesByProperties
8. Test the material of each instance of IfcFlowSegment using IfcRelAssociatesMaterial and IfcMaterial	IfcFlowSegment IfcRelAssociatesMaterial IfcMaterial
9. Compare the size, gradient and material of each instance of IfcFlowSegment with that of the last segment in the traverse.	IfcFlowSegment
10. If there is a change, locate an instance of IfcDistributionChamberElement of an appropriate IfcDistributionChamberElementType (inspection chamber, manhole).	IfcDistributionChamberElementType IfcDistributionChamberElement

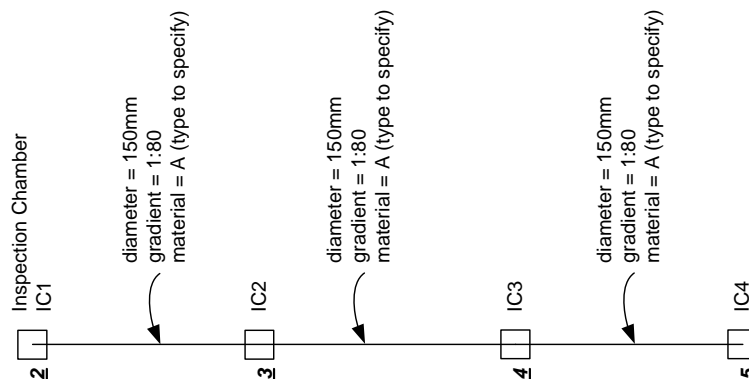


Figure 1: Inspection chambers/manholes on sewerage lines

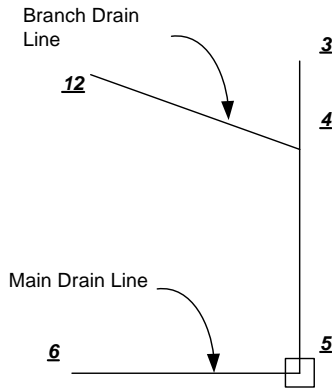


Figure 2: Inspection chambers/manholes at junction or change of direction on sewerage lines

S3: Provide Access to Isolating Valves and Flow Meters

Flow	Entity
1. Locate valves of meters that are providing flow control and to which access is required.	IfcDistributionChamberElementType IfcDistributionChamberElement
2. Determine size of access required	
3. Determine appropriate method of identification required	
4. Locate an instance of IfcDistributionChamberElement of an appropriate IfcDistributionChamberElementType (valve chamber, meter chamber).	IfcDistributionChamberElementType IfcDistributionChamberElement
5. Attach an instance of an appropriate property set (Pset_DistributionChamberElementTypeValveChamber or Pset_DistributionChamberElementTypeMeterChamber) with relevant properties asserted.	Pset_DistributionChamberElementTypeValveChamber Pset_DistributionChamberElementTypeMeterChamber

Post Conditions

Access points to distribution services are defined and located.

IFC Usage and Extension Requirements

Existing Entity/Class Usage

Entity Class Name	Usage
IfcElectricalCircuit	Grouping of elements that defines an electrical system specifically
IfcSystem	Grouping of elements that defines a system generally (other than an electrical circuit as defined above).
IfcFlowSegment	An instance of a flow segment of a particular type
IfcPipeSegmentType	Enables identification of different types of pipe segment used.
IfcCableSegmentType	Enables identification of different types of cable segment used
IfcFlowFitting	An instance of a flow fitting of a particular type
IfcJunctionBoxType	Enables identification of different types of junction connection between flow segments

	of an electrical system
IfcPipeFittingType	Enables identification of different types of pipe fitting used
IfcFlowController	An instance of a flow controller of a particular type
IfcFlowMeterType	Enables identification of different types of flow meter used (gas, electric etc)
IfcValveType	Enables identification of different types of valve used
IfcDistributionChamberElement	An instance of a distribution chamber element of a particular type
IfcDistributionChamberElementType	Enables identification of different types of distribution chamber element used
IfcDistributionPort	May be used to define connectivity between different elements of a distribution system
IfcMaterial	
IfcRelConnectsPorts	A relationship class that defines the connectivity between instances of IfcDistributionPort
IfcRelConnectsPortToElement	A relationship class that defines the association between an IfcDistributionPort and the Element for which it provides the connection.
IfcRelAssignsToGroup	A relationship class that makes the assignment of elements to a system
IfcRelDefinesByProperties	Definition of a property set that characterizes a distribution element type or instance.
IfcRelDefinesByType	Definition of the type that characterizes a distribution element instance.
IfcRelAssociatesMaterial	A relationship class that associates an instance of an IfcMaterial to one or more objects.

Existing Property Set Usage

<i>Property Set Name</i>	<i>Usage</i>
Pset_PipeSegmentTypeCommon	
Pset_FlowSegmentPipeSegment	
Pset_PipeFittingTypeCommon	
Pset_DistributionChamberElementTypeInspectionChamber	
Pset_DistributionChamberElementTypeManhole	
Pset_DistributionChamberElementTypeValveChamber	
Pset_DistributionChamberElementTypeMeterChamber	

Existing Property Set with Proposed Modification

<i>Property Set Name</i>	<i>Usage</i>

<i>AR M</i>	<i>Property</i>	<i>Type</i>	<i>Datatype</i>	<i>Unit</i>	<i>Definition</i>

Issue List

<i>Question</i>	<i>Answer</i>