



**</ agc XML >**  
*Information Exchange*

**THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA  
NATIONAL INSTITUTE OF BUILDING SCIENCES**

**agcXML**

**CHANGE ORDER  
DATA SPECIFICATION AND SCHEMA**

**VERSION 1.0  
MARCH 4, 2009**

## **The agcXML Project**

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**March 2009**

# 1 . CHANGE ORDER

The agcXML **ChangeOrder** schema is discussed in this document as a class diagram using the Unified Modeling Language notation, UML. The document should present the overall structure of the agcXML schema and discuss its components and dependencies – particularly the interrelationship between the common layer for aecXML definitions, common agcXML definitions and the particular usage and extension for the **ChangeOrder** schema. It also shows where components from ifcXML are reused and where IFC based BIM information can be handled and mapped into agcXML.

## 1.1 The ChangeOrder schema

The **ChangeOrder** schema is the schema to be used for sending and receiving change orders between parties involved in electronic exchange of business messages. The schema deals with the variable part of the change order, not with the layout of the documents. In scope are:

- The meta-data of the change order document (who, when, with what application)
- The Sender, Recipient and Notifiee role (for owner, contractor, sub contractor, construction manager and architect information)
- The project information
- The change order
- The change in project schedule

### 1.1.1 Name space considerations

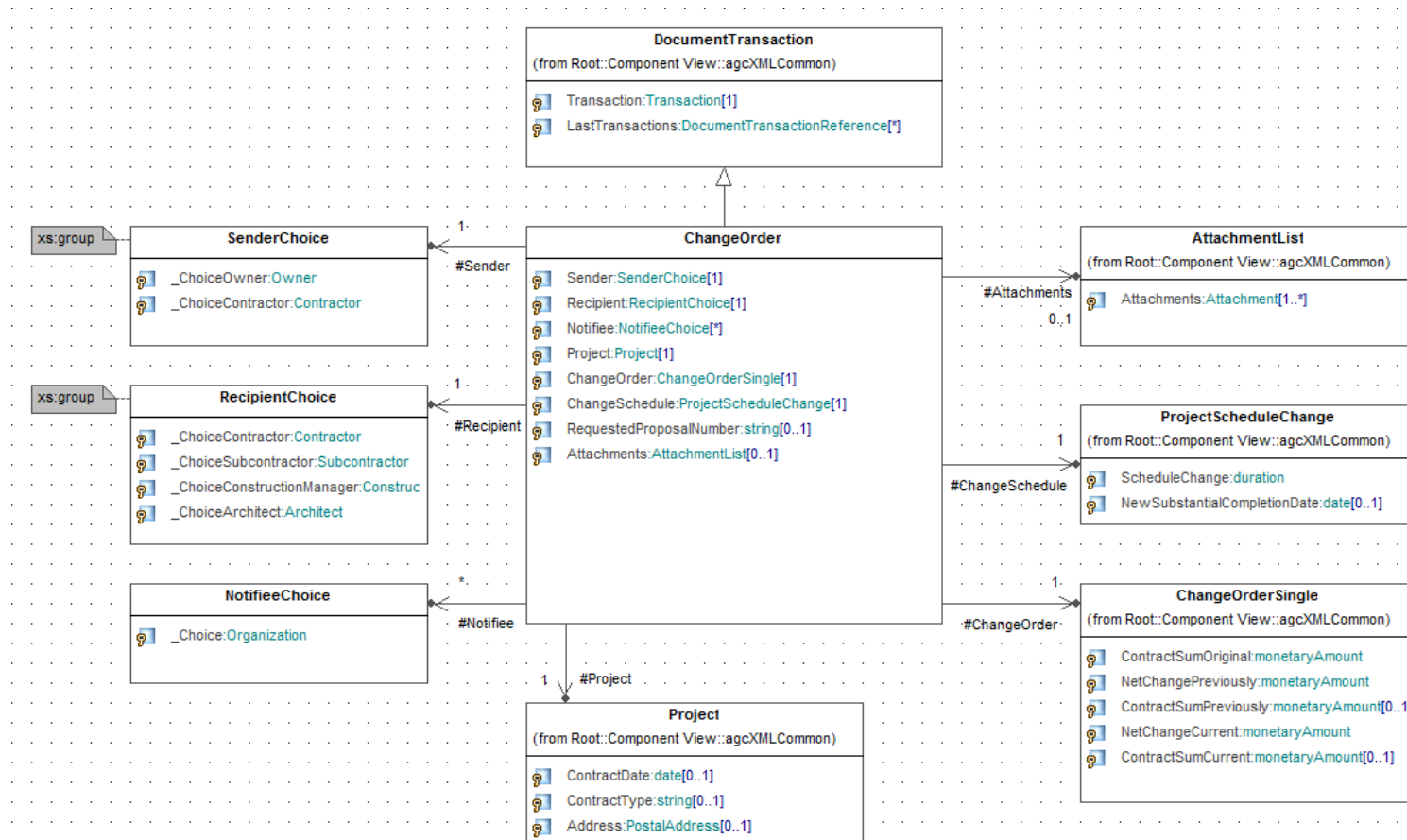
The following name spaces are assigned:

- ifcXML – not part of the XML schema, will be handled by XSLT based mapping, when required
- aecXMLCOS:
  - `xmlns:cos="http://www.aecXML.org/aecXML/cos"`
- agcXMLCommon:
  - `xmlns:agcxml="http://www.aecXML.org/agcXML/agcXMLCommon"`
- ChangeOrder:
  - `xmlns:agcsov="http://www.aecXML.org/agcXML/ChangeOrder"`

## 1.2 The ChangeOrder root element

The root element of the xml exchange document is the **ChangeOrder** element. It is defined in the **ChangeOrder** name space, and inherits from the **DocumentTransaction** in the **agcXMLCommon** name space. All attributes and elements of **DocumentTransaction** are explained in the document “agcXML common definitions”.

The **ChangeOrder** element adds the following change order specific elements:

Figure 1: the root element **ChangeOrder** in **ChangeOrder** name space

### 1.2.1 Basic document information

The **ChangeOrder** carries (if fully instantiated) the following information:

- The governing form (i.e. the template for the change order document)
- The information about the parties of the change order
  - The Sender information, being either:
    - Owner information (e.g. for owner-contractor change orders)
    - Contractor information (e.g. for contractor-subcontractor change orders)
  - The Recipient information, being either:
    - Contractor information (e.g. for owner-contractor change orders)
    - Subcontractor information (e.g. for contractor-subcontractor change orders)
  - The Notifiee information, being either
    - any organization
- The project information (name and reference number)
- The change order
  - With original, previous and current contract sum and changes
- The change in project schedule
  - With change in time and new substantial completion date
- Request for a proposal number
- (Optionally) an attachment to the change order

### 1.2.2 Governing form

The exchange of the change order is based on the standard forms published by AGC (or potentially also other standard forms). The element **GoverningForm** is defined at **Document**.

It identifies the underlying and governing form, which currently may be any one of the following:

- |  |   |
|--|---|
| ▪ ConsensusDOCS 202<br>(formerly AGC Document 202) | Change Order  |
| ▪ ConsensusDOCS 495<br>(formerly AGC Document 495) | Design-Build Change Order                           |
| ▪ ConsensusDOCS 496<br>(formerly AGC Document 496) | Design-Build Change Order (Lump Sum Agreement)      |
| ▪ ConsensusDOCS 525<br>(formerly AGC Document 525) | Change Order (Construction Manager Fee Adjustment)  |
| ▪ ConsensusDOCS 695                                | Subcontract Change Order                            |
| ▪ AIA Document G701-2001                           | Change Order  |
| ▪ AIA Document G701/CMA-1992                       | Change Order – Construction Manager-Adviser Edition |

## 1.3 The parties involved in the change order

A change order transaction is established between a Sender and a Recipient. In addition, others can be involved as Notifiees.

Information about organization and person information of the parties is provided in the document “agcXML common definitions”, section “Person and organization”.

### 1.3.1 The sender information

The sender, or client, for the **ChangeOrder** can be presented by the **Owner** (e.g. for owner-contractor change orders) or by the **Contractor** (e.g. for contractor-subcontractor change orders). It is accessible as **Sender**, being a choice group of either **Owner**, or **Contractor**.

### 1.3.2 The recipient information

The recipient, or applicant, for the **ChangeOrder** can be presented by the **Contractor** (e.g. for owner-contractor change orders) or by the **Subcontractor** (e.g. for contractor-subcontractor change orders). It is accessible as **Recipient**, being a choice group of **Contractor** or **Subcontractor**,

### 1.3.3 The notifyee information

The notifyee, or advisor, for the **ChangeOrder** can be presented by any organization. The notifyee information is optional.

### 1.3.4 Choice of roles for sender, recipient and notifyee

The information about the organizations and their representatives is shown below, independently of whether it is used in a sender, recipient or notifyee role.

## 1.4 The project information of the change order

The **ProjectInformation** is provided by **Project**. Information about **Project** is provided in the document “agcXML common definitions”. The minimum information provided is **ProjectInformation.Name**, **.ProjectId**, **.Description**, **.ProjectType** (for the “contract for” field) and **.ContractDate**.

## 1.5 The change order information

The **ChangeOrder** provides the information about the change order in terms of original, previous and current contract sum and previous and current net changes. It is provided by the element **ChangeOrderSingle** defined in the **agcXMLCommon** name space.

Information about **ChangeOrderSingle** is provided in the document “agcXML common definitions”, section “Change order”.

## 1.6 The change of project schedule

The change in project time is provided by the element **ProjectScheduleChange**, defined in the **agcXMLCommon** name space.

Information about **ProjectScheduleChange** is provided in the document “agcXML common definitions”, section “Schedule”.

## 2 XML SCHEMA

The XML schema definitions are defined in different name spaces following the agcXML technical framework.

- The most general definitions are included in the [aecXMLCOS](#) name space; some of those definitions are taken from other standards, such as [ifcXML](#) for general elements and ISO-IEC\_82045-5 for document metadata.
- Definitions that are common to AGC document exchanges within the scope of [agcXML](#) are included in the [agcXMLCommon](#) name space.
- Definitions that are specific to the exchange of change orders are included in the [ChangeOrder](#) name space.

### 2.1 agcXMLChO name space

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Mit XMLSpy v2007 sp2 (http://www.altova.com) von Thomas Liebich (AEC3 Deutschland GmbH) bearbeitet
-->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:cos="http://www.aecXML.org/aecXML/cos"
  xmlns:agcxml="http://www.aecXML.org/agcXML/agcXMLCommon"
  xmlns:agccho="http://www.aecXML.org/agcXML/ChangeOrder"
  targetNamespace="http://www.aecXML.org/agcXML/ChangeOrder" elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:import namespace="http://www.aecXML.org/aecXML/cos" schemaLocation="aecXMLCOS.xsd"/>
  <xs:import namespace="http://www.aecXML.org/agcXML/agcXMLCommon" schemaLocation="agcXMLCommon.xsd"/>
  <!--change order diagram-->
  <xs:element name="ChangeOrder" type="agccho:ChangeOrder"
    substitutionGroup="agcxml:DocumentTransaction" nillable="false">
    <xs:annotation>
      <xs:documentation>Root element for the XML exchange document for AGC change
        orders</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:complexType name="ChangeOrder">
    <xs:complexContent>
      <xs:extension base="agcxml:DocumentTransaction">
        <xs:sequence>
          <xs:element name="Sender">
            <xs:complexType>
              <xs:group ref="agccho:SenderChoice"/>
            </xs:complexType>
          </xs:element>
          <xs:element name="Recipient">
            <xs:complexType>
              <xs:group ref="agccho:RecipientChoice"/>
            </xs:complexType>
          </xs:element>
          <xs:element name="Notifinee">
            <xs:complexType>
              <xs:choice>
                <xs:element ref="agcxml:Organization"/>
              </xs:choice>
            </xs:complexType>
          </xs:element>
          <xs:element name="Project" type="agcxml:Project"/>
          <xs:element name="ChangeOrder" type="agcxml:ChangeOrderSingle"/>
          <xs:element name="ChangeSchedule" type="agcxml:ProjectScheduleChange"/>
          <xs:element name="RequestedProposalNumber" type="xs:string" minOccurs="0"/>
          <xs:element name="Attachments" type="agcxml:AttachmentList" minOccurs="0"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <!--change order actor diagram - Group definition for choice of client, applicant, and advisor-->
  <xs:group name="SenderChoice">
    <xs:choice>
      <xs:element ref="agcxml:Owner"/>
      <xs:element ref="agcxml:Contractor"/>
    </xs:choice>
  </xs:group>
</xs:schema>
```

```
        </xs:choice>
    </xs:group>
    <xs:group name="RecipientChoice">
        <xs:choice>
            <xs:element ref="agcxml:Contractor"/>
            <xs:element ref="agcxml:Subcontractor"/>
        </xs:choice>
    </xs:group>
</xs:schema>
```



## A ASSIGNMENT TO COMPARATIVE ANALYSIS

The following table shows each agcXML element reference (defined as a path from root element **ChangeOrder** in **ChangeOrder** name space) assigned to the corresponding data field obtained from the comparative analysis of the existing transaction media for change order transactions (the commonly accepted standard contract forms published by the AIA, AGC, and EJCDC, and others). The table is NOT intended to represent the entire content of the schema or the actual cardinality of each element in the schema. The full comparative analysis is published separately and can be obtained from AGC.

agcXML Comparative Analysis Data Field Description/Content	Cardinality	Change Order for owner to contractor change orders agcXML path
<b>Agreement Date</b>		
Project Agreement Date (dd/mm/yyyy)	[1]	ProjectInformation.ContractDate
<b>Owner Information</b>		
Owner Company Name	[1]	Sender: Owner.Name
Owner Project Number	[1]	Sender: Owner.ProjectNumber
Owner Address 1	[1]	Sender: Owner.PostalAddress.AddressLine1
Owner Address 2	[1]	Sender: Owner.PostalAddress.AddressLine2
Owner City	[1]	Sender: Owner.PostalAddress.Town
Owner State	[1]	Sender: Owner.PostalAddress.Region
Owner Country	[1]	Sender: Owner.PostalAddress.Country
Owner Postal Code	[1]	Sender: Owner.PostalAddress.PostalCode
Owner Representative Last Name	[1]	Sender: Owner.Representative.FamilyName
Owner Representative First Name	[1]	Sender: Owner.Representative.GivenName
Owner Representative Title	[1]	Sender: Owner.Representative.RepresentativeTitle
Owner Representative Change Order Signature		Sender: Owner.Representative.Signature.SignatoryName
Owner Representative Change Order Signature Date		Sender: Owner.Representative.Signature.SignatureDate
<b>Contractor Information</b>		
Contractor Company Name	[1]	Sender: Contractor.Name or Recipient: Contractor.Name
Contractor Project Number	[1]	Sender: Contractor.ProjectNumber or Recipient: Contractor.ProjectNumber
Contractor Address 1	[1]	Sender: Contractor.PostalAddress.AddressLine1 or Recipient: Owner.PostalAddress.AddressLine1
Contractor Address 2	[1]	Sender: Contractor.PostalAddress.AddressLine2 or Recipient: Owner.PostalAddress.AddressLine2
Contractor City	[1]	Sender: Contractor.PostalAddress.Town or Recipient: Owner.PostalAddress.Town
Contractor State	[1]	Sender: Contractor.PostalAddress.Region or Recipient: Owner.PostalAddress.Region
Contractor Country	[1]	Sender: Contractor.PostalAddress.Country or Recipient: Owner.PostalAddress.Country
Contractor Postal Code	[1]	Sender: Contractor.PostalAddress.PostalCode or Recipient: Contractor.PostalAddress.PostalCode

Contractor Representative Last Name	[1]	Recipient: Contractor.Representative.FamilyName or Sender: Contractor.Representative.FamilyName
Contractor Representative First Name	[1]	Recipient: Contractor.Representative.GivenName or Sender: Contractor.Representative.GivenName
Contractor Representative Title	[1]	Recipient: Contractor.Representative.RepresentativeTitle or Sender: Contractor.Representative.RepresentativeTitle
Contractor Representative		Recipient: Contractor.Representative.Signature.SignatoryName or
Change Order Signature	[1]	Sender: Contractor.Representative.Signature.SignatoryName
Contractor Representative		Recipient: Contractor.Representative.Signature.SignatureDate or
Change Order Signature Date	[1]	Sender: Contractor.Representative.Signature.SignatureDate
<b>Construction Manager Information</b>		
Construction Manager Company Name	[0..1]	Notiffee: ConstructionManager.Name
Construction Manager Project Number	[0..1]	Notiffee: ConstructionManager.ProjectNumber
Construction Manager Address 1	[0..1]	Notiffee: ConstructionManager.PostalAddress.AddressLine1
Construction Manager Address 2	[0..1]	Notiffee: ConstructionManager.PostalAddress.AddressLine2
Construction Manager City	[0..1]	Notiffee: ConstructionManager.PostalAddress.Town
Construction Manager State	[0..1]	Notiffee: ConstructionManager.PostalAddress.Region
Construction Manager Country	[0..1]	Notiffee: ConstructionManager.PostalAddress.Country
Construction Manager Postal Code	[0..1]	Notiffee: ConstructionManager.PostalAddress.PostalCode
Construction Manager Representative Last Name	[0..1]	Notiffee: ConstructionManager.Representative.FamilyName
Construction Manager Representative First Name	[0..1]	Notiffee: ConstructionManager.Representative.GivenName
Construction Manager Representative		
Change Order Signature	[0..1]	Notiffee: ConstructionManager.Representative.Signature.SignatoryName
Construction Manager Representative		
Change Order Signature Date	[0..1]	Notiffee: ConstructionManager.Representative.Signature.SignatureDate
<b>Prime Design Professional Information</b>		
Architect/Engineer Company Name	[0..1]	Notiffee: Architect.Name
Architect/Engineer Project Number	[0..1]	Notiffee: Architect.ProjectNumber
Architect/Engineer Address 1	[0..1]	Notiffee: Architect.PostalAddress.AddressLine1
Architect/Engineer Address 2	[0..1]	Notiffee: Architect.PostalAddress.AddressLine2
Architect/Engineer City	[0..1]	Notiffee: Architect.PostalAddress.Town
Architect/Engineer State	[0..1]	Notiffee: Architect.PostalAddress.Region
Architect/Engineer Country	[0..1]	Notiffee: Architect.PostalAddress.Country
Architect/Engineer Postal Code	[0..1]	Notiffee: Architect.PostalAddress.PostalCode
Architect/Engineer Representative Last Name	[0..1]	Notiffee: Architect.Representative.FamilyName
Architect/Engineer Representative First Name	[0..1]	Notiffee: Architect.Representative.GivenName
Architect/Engineer Representative Title	[0..1]	Notiffee: Architect.Representative.RepresentativeTitle
Architect/Engineer Representative		
Application for Payment Signature	[0..1]	Notiffee: Architect.Representative.Signature.SignatoryName
Architect/Engineer Representative		
Application for Payment Signature Date	[0..1]	Notiffee: Architect.Representative.Signature.SignatureDate
<b>Project Information</b>		
Project Name 1 (e.g., Smith Biophysics Laboratory)	[1]	ProjectInformation.Name

Project Reference Number	[1]	ProjectInformation.ProjectId
Type of contract	[0..1]	ProjectInformation.Description
<b>Change Order Information</b>		
Change Order Number	[1]	Name
Change Order Date	[1]	PreparationDate
Change Order Computation Method		
1. No Change		
2. Costs Plus a Fee		
3. Unit Price		
4. Lump Sum of		
Distribution to (check all that apply)		<i>note: it is only a tick for the document distribution</i>
Owner	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Construction Manager		<i>to be included in general document meta information (following a consolidated approach)</i>
Architect	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Contractor	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Field	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Other	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Original Contract Sum, in dollars	[1]	ChangeOrderInformation.ContractSumOriginal
Change in Contract Sum by Change Order to Date, in dollars	[1]	ChangeOrderInformation.NetChangePreviously
Contract Sum to Date, in dollars	[1]	ChangeOrderInformation.ContractSumPreviously
Increase in Contract Sum	[1]	ChangeOrderInformation.NetChangeCurrently
New Contract Sum	[1]	ChangeOrderInformation.ContractSumCurrently
Change in Contract Time	[1]	ChangeScheduleInformation.ScheduleChange
New Data of Substantial Completion	[1]	ChangeScheduleInformation.NewSubstantialCompletionDate

Table 1: agcXML path information assigned to the fields of the comparative analysis

agcXML Comparative Analysis Data Field Description/Content	Cardinality	Subcontractor Change Order agcXML path
<b>Agreement Date</b>		
Subcontract Date (dd/mm/yyyy)	[1]	ProjectInformation.ContractDate
<b>Owner Information</b>		
Owner Company Name	[1]	Notiffee: Owner.Name
<b>Subcontractor Information</b>		
Subcontractor Company Name	[1]	Recipient: Subcontractor.Name
Subcontractor Project Number	[1]	Recipient: Subcontractor.ProjectNumber
Subcontractor Address 1	[1]	Recipient: Subcontractor.PostalAddress.AddressLine1
Subcontractor Address 2	[1]	Recipient: Subcontractor.PostalAddress.AddressLine2
Subcontractor City	[1]	Recipient: Subcontractor.PostalAddress.Town
Subcontractor State	[1]	Recipient: Subcontractor.PostalAddress.Region
Subcontractor Country	[1]	Recipient: Subcontractor.PostalAddress.Country
Subcontractor Postal Code	[1]	Recipient: Subcontractor.PostalAddress.PostalCode
Subcontractor Representative Last Name	[1]	Recipient: Subcontractor.Representative.FamilyName
Subcontractor Representative First Name	[1]	Recipient: Subcontractor.Representative.GivenName
Subcontractor Representative Title	[1]	Recipient: Subcontractor.Representative.RepresentativeTitle
Subcontractor Representative Change Order Signature	[1]	Recipient: Subcontractor.Representative.Signature.SignatoryName
Subcontractor Representative Change Order Signature Date	[1]	Recipient: Subcontractor.Representative.Signature.SignatureDate
<b>Contractor Information</b>		
Contractor Company Name	[1]	Sender: Contractor.Name or
Contractor Project Number	[1]	Sender: Contractor.ProjectNumber or
Contractor Address 1	[1]	Sender: Contractor.PostalAddress.AddressLine1
Contractor Address 2	[1]	Sender: Contractor.PostalAddress.AddressLine2
Contractor City	[1]	Sender: Contractor.PostalAddress.Town
Contractor State	[1]	Sender: Contractor.PostalAddress.Region
Contractor Country	[1]	Sender: Contractor.PostalAddress.Country
Contractor Postal Code	[1]	Sender: Contractor.PostalAddress.PostalCode
Contractor Representative Last Name	[1]	Sender: Contractor.Representative.FamilyName
Contractor Representative First Name	[1]	Sender: Contractor.Representative.GivenName
Contractor Representative Title	[1]	Sender: Contractor.Representative.RepresentativeTitle
Contractor Representative Change Order Signature	[1]	Sender: Contractor.Representative.Signature.SignatoryName
Contractor Representative Change Order Signature Date	[1]	Sender: Contractor.Representative.Signature.SignatureDate
<b>Project Information</b>		
Project Name 1 (e.g., Smith Biophysics Laboratory)	[1]	ProjectInformation.Name
Project Reference Number	[1]	ProjectInformation.ReferenceNumber
Type of subcontract	[0..1]	ProjectInformation.Description
<b>Change Order Information</b>		
Change Order Number	[1]	Name
Change Order Date	[1]	PreparationDate
Change Order Computation Method		

1. No Change		
2. Costs Plus a Fee		
3. Unit Price		
4. Lump Sum of		
Distribution to (check all that apply)		<i>note: it is only a tick for the document distribution</i>
Owner	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Construction Manager		<i>to be included in general document meta information (following a consolidated approach)</i>
Architect	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Contractor	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Field	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Other	[0..1]	<i>to be included in general document meta information (following a consolidated approach)</i>
Original Subcontract Sum, in dollars	[1]	ChangeOrderInformation.ContractSumOriginal
Change in Subcontract Sum by Change Order to Date, in dollars	[1]	ChangeOrderInformation.NetChangePreviously
Subcontract Sum to Date, in dollars	[1]	ChangeOrderInformation.ContractSumPreviously
Increase in Subcontract Sum	[1]	ChangeOrderInformation.NetChangeCurrently
New Subcontract Sum	[1]	ChangeOrderInformation.ContractSumCurrently
Change in Subcontract Time	[1]	ChangeScheduleInformation.ScheduleChange
New Data of Substantial Completion	[1]	ChangeScheduleInformation.ScheduleChange

*Table 2: agcXML path information assigned to the fields of the comparative analysis specific to subcontractor*