



U-VALUE CALCULATOR API

Documentation version 1.5.3

Last Updated: 04th of July 2023

API Resources

- Url: <https://api.uvaluecalculator.pauleycreative.co.uk/>
- Test tool: <https://uvaluecalculator.pauleycreative.co.uk/u-value-calculator>

API Requirements

- Licence key (*provided by Pauley Creative*)
- Access token (*provided by Pauley Creative*)

Licence Key

Authorization type: API Key

The authorization should validate via header each time when requests come through the API. Expired or invalid licence keys will not pass through the authorisation process and will not get access to API.

Access token

This will be required only at the beginning of the API calculation process. Invalid access token will not send any construction data.

API Version Release Update Notes

- Version 1.5.3
 - 1) Add 2 new properties on **ApplicationLayerMaterialViewModel** entity
 - a) ApplicationLayerDefaultExtraThicknessForAirGap (*decimal*)
 - b) HasTimberRafterDepthIgnoreRule (*bool*)

API Calculation Process

- 1) <https://api.uvaluecalculator.pauleycreative.co.uk/get-all-construction-types/{accessToken}>

Method: GET

Purpose: Get all the active construction types.

Request Information		
URI Parameters		
Name	Data Type	Required
accessToken	string	Yes

Response Information																																			
ConstructionType Entity * ¹																																			
▪ Client Entity * ²																																			
<table><tr><th colspan="3">Client</th></tr><tr><th>Name</th><th>Data Type</th><th>Accessibility</th></tr><tr><td>ClientId</td><td>integer</td><td>private</td></tr><tr><td>Name</td><td>string</td><td>private</td></tr><tr><td>Introduction</td><td>string</td><td>private</td></tr><tr><td>Logo</td><td>string</td><td>private</td></tr><tr><td></td><td></td><td></td></tr></table>			Client			Name	Data Type	Accessibility	ClientId	integer	private	Name	string	private	Introduction	string	private	Logo	string	private															
Client																																			
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Code	string	private																																	
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Note	string	private																																	
DisplayOrder	integer	private																																	
NextAction * ⁴	string	private																																	
Note(s):																																			
a) * ¹ ConstructionType entity contained with client entity and construction type item entity list.																																			
b) * ² Client entity has all client related data.																																			

- c) *³ **ConstructionTypeItem**List is a collection of **ConstructionTypeItem** entities.
- d) *⁴ **NextAction** property value shows which API should call next.
- e) Accessibility "private" means values can be only access but cannot set new values or alter values.

Sample JSON Response

Data type: application/json, text/json

```
{
  "Client": {
    "$id": "2",
    "ClientId": 1,
    "Name": "sample string 2",
    "Introduction": "sample string 3",
    "Logo": "sample string 4"
  },
  "ConstructionTypeItemList": [
    {
      "$id": "3",
      "ConstructionTypeId": 1,
      "Name": "sample string 2",
      "Code": "sample string 3",
      "AirGapType": "sample string 4",
      "Icon": "sample string 5",
      "Note": "sample string 6",
      "DisplayOrder": 7,
      "NextAction": "sample string 8"
    },
    {
      "$ref": "3"
    }
  ]
}
```

- 2) <https://api.uvaluecalculator.pauleycreative.co.uk/get-all-parent-construction-groups/{constructionTypeId}>

Method: POST

Purpose: Get all the active parent construction groups for any selected construction type.

Request Information																							
URI Parameters																							
Name	Data Type	Required																					
constructionTypeId	integer	Yes																					
Body Parameters																							
Client Entity																							
<table><tr><th colspan="3">Client</th></tr><tr><th>Name</th><th>Data Type</th><th>Required</th></tr><tr><td>ClientId</td><td>integer</td><td>Yes</td></tr><tr><td>Name</td><td>string</td><td>Yes</td></tr><tr><td>Introduction</td><td>string</td><td>Yes</td></tr><tr><td>Logo</td><td>string</td><td>Yes</td></tr><tr><td></td><td></td><td></td></tr></table>			Client			Name	Data Type	Required	ClientId	integer	Yes	Name	string	Yes	Introduction	string	Yes	Logo	string	Yes			
Client																							
Name	Data Type	Required																					
ClientId	integer	Yes																					
Name	string	Yes																					
Introduction	string	Yes																					
Logo	string	Yes																					
Note(s): a) This is the same Client entity retrieved from "https://api.uvaluecalculator.pauleycreative.co.uk/get-all-construction-types/{accessToken}" API call.																							

Sample JSON Request Formats
Data type: application/json, text/json
<pre>{ "ClientId": 1, "Name": "sample string 2", "Introduction": "sample string 3", "Logo": "sample string 4" }</pre>

Response Information

ConstructionGroup Entity * ¹

- Client Entity * ²

Client		
Name	Data Type	Accessibility
ClientId	integer	private
Name	string	private
Introduction	string	private
Logo	string	private

- ConstructionTypeItem Entity * ³

ConstructionTypeItem		
Name	Data Type	Accessibility
ConstructionTypeId	integer	private
Name	string	private
Code	string	private
AirGapType	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupItemList (Collection of ConstructionGroupItem entities) * ⁴

ConstructionGroupItem		
Name	Data Type	Accessibility
ConstructionGroupId	integer	private
Name	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction * ⁵	string	private

Note(s):

- * ¹ **ConstructionGroup** entity contained with client entity, construction type entity and construction group item entity list.
- * ² **Client** entity has all client related data.
- * ³ **ConstructionTypeItem** entity has all construction type related data.

- d) *⁴ **ConstructionGroupItem** is a collection of **ConstructionGroupItem** entities.
- e) *⁵ **NextAction** property value shows which API should call next.
- f) Accessibility “private” means values can be only access but cannot set new values or alter values.

Sample JSON Response

Data type: application/json, text/json

```
{
  "Client": {
    "$id": "2",
    "ClientId": 1,
    "Name": "sample string 2",
    "Introduction": "sample string 3",
    "Logo": "sample string 4"
  },
  "ConstructionTypeItem": {
    "$id": "3",
    "ConstructionTypeId": 1,
    "Name": "sample string 2",
    "Code": "sample string 3",
    "AirGapType": "sample string 4",
    "Icon": "sample string 5",
    "Note": "sample string 6",
    "DisplayOrder": 7,
    "NextAction": "sample string 8"
  },
  "ConstructionGroupItemList": [
    {
      "$id": "4",
      "ConstructionGroupId": 1,
      "Name": "sample string 2",
      "Icon": "sample string 3",
      "Note": "sample string 4",
      "DisplayOrder": 5,
      "NextAction": "sample string 6"
    },
    {
      "$ref": "4"
    }
  ]
}
```

- 3) <https://api.uvaluecalculator.pauleycreative.co.uk/get-all-child-construction-groups/{constructionTypeId}/{constructionGroupId}>

Method: POST

Purpose: Get all the active child construction groups for any selected construction type and parent construction group.

Request Information																							
URI Parameters																							
Name	Data Type	Required																					
constructionTypeId	integer	Yes																					
constructionGroupId	integer	Yes																					
Body Parameters																							
Client Entity																							
<table><tr><th colspan="3">Client</th></tr><tr><th>Name</th><th>Data Type</th><th>Required</th></tr><tr><td>ClientId</td><td>integer</td><td>Yes</td></tr><tr><td>Name</td><td>string</td><td>Yes</td></tr><tr><td>Introduction</td><td>string</td><td>Yes</td></tr><tr><td>Logo</td><td>string</td><td>Yes</td></tr><tr><td></td><td></td><td></td></tr></table>			Client			Name	Data Type	Required	ClientId	integer	Yes	Name	string	Yes	Introduction	string	Yes	Logo	string	Yes			
Client																							
Name	Data Type	Required																					
ClientId	integer	Yes																					
Name	string	Yes																					
Introduction	string	Yes																					
Logo	string	Yes																					
Note(s): a) This is the same Client entity retrieved from "https://api.uvaluecalculator.pauleycreative.co.uk/get-all-parent-construction-groups/{constructionTypeId}" API call.																							

Sample JSON Request Formats
Data type: application/json, text/json
<pre>{ "ClientId": 1, "Name": "sample string 2", "Introduction": "sample string 3", "Logo": "sample string 4" }</pre>

Response Information

ConstructionGroup Entity * ¹

- Client Entity * ²

Client		
Name	Data Type	Accessibility
ClientId	integer	private
Name	string	private
Introduction	string	private
Logo	string	private

- ConstructionTypeItem Entity * ³

ConstructionTypeItem		
Name	Data Type	Accessibility
ConstructionTypeId	integer	private
Name	string	private
Code	string	private
AirGapType	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupItemList (Collection of ConstructionGroupItem entities) * ⁴

ConstructionGroupItem		
Name	Data Type	Accessibility
ConstructionGroupId	integer	private
Name	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction * ⁵	string	private

Note(s):

- * ¹ **ConstructionGroup** entity contained with client entity, construction type entity and construction group item entity list.
- * ² **Client** entity has all client related data.
- * ³ **ConstructionTypeItem** entity has all construction type related data.

- d) *⁴ **ConstructionGroupItem**List is a collection of **ConstructionGroupItem** entities.
- e) *⁵ **NextAction** property value shows which API should call next.
- f) Accessibility “private” means values can be only access but cannot set new values or alter values.

Sample JSON Response

Data type: application/json, text/json

```
{
  "Client": {
    "$id": "2",
    "ClientId": 1,
    "Name": "sample string 2",
    "Introduction": "sample string 3",
    "Logo": "sample string 4"
  },
  "ConstructionTypeItem": {
    "$id": "3",
    "ConstructionTypeId": 1,
    "Name": "sample string 2",
    "Code": "sample string 3",
    "AirGapType": "sample string 4",
    "Icon": "sample string 5",
    "Note": "sample string 6",
    "DisplayOrder": 7,
    "NextAction": "sample string 8"
  },
  "ConstructionGroupItemList": [
    {
      "$id": "4",
      "ConstructionGroupId": 1,
      "Name": "sample string 2",
      "Icon": "sample string 3",
      "Note": "sample string 4",
      "DisplayOrder": 5,
      "NextAction": "sample string 6"
    },
    {
      "$ref": "4"
    }
  ]
}
```

- 4) <https://api.uvaluecalculator.pauleycreative.co.uk/get-all-construction-group-form-field-data/{constructionGroupId}>

Method: POST

Purpose: Get all the active construction group form fields for calculator UI.

Request Information																							
URI Parameters																							
Name	Data Type	Required																					
constructionGroupId	integer	Yes																					
Body Parameters																							
Client Entity																							
<table><tr><th colspan="3">Client</th></tr><tr><th>Name</th><th>Data Type</th><th>Required</th></tr><tr><td>ClientId</td><td>integer</td><td>Yes</td></tr><tr><td>Name</td><td>string</td><td>Yes</td></tr><tr><td>Introduction</td><td>string</td><td>Yes</td></tr><tr><td>Logo</td><td>string</td><td>Yes</td></tr><tr><td></td><td></td><td></td></tr></table>			Client			Name	Data Type	Required	ClientId	integer	Yes	Name	string	Yes	Introduction	string	Yes	Logo	string	Yes			
Client																							
Name	Data Type	Required																					
ClientId	integer	Yes																					
Name	string	Yes																					
Introduction	string	Yes																					
Logo	string	Yes																					
Note(s): a) This is the same Client entity retrieved from "https://api.uvaluecalculator.pauleycreative.co.uk/get-all-parent-construction-groups/{constructionTypeId}" or "https://api.uvaluecalculator.pauleycreative.co.uk/get-all-child-construction-groups/{constructionTypeId}/{constructionGroupId}" API call.																							

Sample JSON Request Formats
Data type: application/json, text/json
<pre>{ "ClientId": 1, "Name": "sample string 2", "Introduction": "sample string 3", "Logo": "sample string 4" }</pre>

Response Information

ConstructionApplication Entity * ¹

- Client Entity * ²

Client		
Name	Data Type	Accessibility
ClientId	integer	private
Name	string	private
Introduction	string	private
Logo	string	private

- ConstructionTypeItem Entity * ³

ConstructionTypeItem		
Name	Data Type	Accessibility
ConstructionTypeId	integer	private
Name	string	private
Code	string	private
AirGapType	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupItem Entity * ⁴

ConstructionGroupItem		
Name	Data Type	Accessibility
ConstructionGroupId	integer	private
Name	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupFormFields (Collection of ConstructionGroupFormField entities) * ⁵

ConstructionGroupFormField		
Name	Data Type	Accessibility
ConstructionGroupFormFieldId	integer	private
ConstructionGroupFormFieldTypeName	string	private
ParentId	integer	private
AssociatedChildControlId	integer	private
ApplicationConstructionGroupLayerTypeId	integer	private
ApplicationLayerName	string	private
ApplicationLayerSpecialNote	string	private
DisplayOrder	integer	private
DefaultVisibility	boolean	private
IsRequiredLayer	boolean	private
HasAssociatedFormFieldListingLayer	boolean	private
HasAssociatedFormFieldOptionLayer	boolean	private
UserInputValue * ⁹	string	public

ConstructionGroupFormFieldListingItemList (Collection of ConstructionGroupFormFieldListingItem entities) * ¹⁰

ConstructionGroupFormFieldListingItem		
Name	Data Type	Accessibility
Id	integer	private
ParentId	integer	private
DisplayValue	string	private
HasChildItems	boolean	private

ConstructionGroupFormFieldValidationRuleList (Collection of ConstructionGroupFormFieldValidationRule entities) * ¹¹

ConstructionGroupFormFieldValidationRule		
Name	Data Type	Accessibility
ValidationRuleId	integer	private
AssociatedConstructionGroupFormFieldId	integer	private
ValidationRuleTypeName	string	private
ValidationConditionalRuleTypeName	string	private
ValidationRuleName	string	private
ValidationErrorMessage	string	private
ValidationPattern	string	private
DisplayOrder	integer	private

- ConstructionApplicationResult Entity * 12

ConstructionApplicationResult		
Name	Data Type	Accessibility
ValidationFailed	boolean	private
FinalCalculationResultViewModel Entity		
FinalCalculationResultViewModel		
Name	Data Type	Accessibility
ClientID	integer	private
UValue	decimal	private
UpperLimit	decimal	private
LowerLimit	decimal	private
TotalRValue	decimal	private
TotalUf	decimal	private
PARatio	decimal	private
ConstructionGroupID	integer	private
ApplicationLayerResultViewModel (Collection of ApplicationLayerResultViewModel entities)		
ApplicationLayerResultViewModel		
Name	Data Type	Accessibility
ApplicationLayerId	integer	private
ApplicationLayerName	string	private
ApplicationLayerValue	string	private
LayerUserSelection	string	private
ApplicationLayerTypeName		
LayerType		
Name	Data Type	Accessibility
StaticLayer	integer	private
SingleLayer	integer	private
BridgedLayer	integer	private
BridgeGroup	string	private
ThermalConductivity	decimal	private
Thickness	decimal	private
RValue	decimal	private
HeatPathPercentage	decimal	private
SurfaceEmissivityE1	decimal	private
SurfaceEmissivityE2	decimal	private
HasTimberLayer	boolean	private
DisplayOrder	integer	private

MechanicalFixingViewModel (Collection of MechanicalFixingViewModel entities)

MechanicalFixingViewModel

Name	Data Type	Accessibility
MechanicalFixingInsulationLayerId	integer	private
MechanicalFixingInsulationLayerName	string	private
MechanicalFixingInsulationLayerValue	string	private
MechanicalFixingInsulationLayerUserSelection	string	private
MechanicalFixingInsulationRValue	decimal	private
MechanicalFixingDepth	decimal	private
MechanicalFixingInfo	string	private
A	decimal	private
Lamdaf	decimal	private
Af	decimal	private
nf	decimal	private
DeltaUf	decimal	private
Rtot	decimal	private
HasMechanicalFixingApplied	boolean	private

AirgapCorrectionViewModel Entity

AirgapCorrectionViewModel

Name	Data Type	Accessibility
Y	decimal	private
AirGapLevelType	string	private
AirGapLevel	decimal	private
DeltaUf	decimal	private
DeltaUg	decimal	private
RawUValue	decimal	private
TotalCorrection	decimal	private
HasAirgapCorrectionApplied	boolean	private

HeatPathViewModel (Collection of HeatPathViewModel entities)

HeatPathViewModel

Name	Data Type	Accessibility
TotalRValue	decimal	private
Percentage	decimal	private

LowerLimitViewModel (Collection of LowerLimitViewModel entities)

LowerLimitViewModel

Name	Data Type	Accessibility
LayerName	string	private
LayerValue	decimal	private

ValidatedApplicationLayerViewModel (Collection of ApplicationLayerViewModel entities)

ApplicationLayerViewModel

Name	Data Type	Accessibility
ApplicationLayerTypeName	string	private
LayerCount	integer	private

ApplicationLayerMaterialViewModel (Collection of ApplicationLayerMaterialViewModel entities)

ApplicationLayerMaterialViewModel

Name	Data Type	Accessibility
ApplicationLayerId	integer	private
ApplicationAssociatedChildControlID	integer	private
ApplicationLayerName	string	private
ApplicationLayerValue	string	private
ApplicationLayerType	string	private
ApplicationLayerDefaultThermalConductivityValue	decimal	private
ApplicationLayerDefaultThicknessValue	decimal	private
ApplicationLayerDefaultEmissivityValue	decimal	private
ApplicationLayerDefaultHeatPathPercentageValue	decimal	private
ApplicationLayerDefaultLamdaFValue	decimal	private
ApplicationLayerDefaultAfValue	decimal	private
ApplicationLayerDefaultnfValue	decimal	private
ApplicationLayerDefaultExtraThicknessForAirGap	decimal	private
ApplicationLayerMechanicalFixingInfo	string	private
AllowCalculation	boolean	private
RValue	decimal	private
AirGapRValue	decimal	private
SurfaceEmissivityE1	decimal	private
SurfaceEmissivityE2	decimal	private
HasInsulationLayer	boolean	private
HasTargetUValue	boolean	private
HasInsulationInsideLayer	boolean	private
HasTimberLayer	boolean	private
HasTimberSpacingLayer	boolean	private
HasVentilatedLayer	boolean	private
HasBrickLayer	boolean	private

HasPlasterboardLayer	boolean	private
HasExtraDynamicMaterialLayer	boolean	private
HasMechanicalFixLayer	boolean	private
HasLowEmissivityLayer	boolean	private
HasSuspendedFloor	boolean	private
HasRatioLayer	boolean	private
HasRequiredLayer	boolean	private
HasAlternativeMechanicalFixingRule	boolean	private
HasConditionalLayer	boolean	private
HasTimberRafterDepthIgnoreRule	boolean	private
SplitBridgeLayerMaterialIndex	integer	private
LowEmissivityPreviousInsulationLayerID	integer	private
LowEmissivityNextInsulationLayerID	integer	private

ApplicationLayerMaterialValidationRuleViewModel (Collection of ApplicationLayerMaterialValidationRuleViewModel entities)

ApplicationLayerMaterialValidationRuleViewModel		
Name	Data Type	Accessibility
ValidationRuleID	integer	private
FormFieldID	integer	private
AssociatedFormFieldID	integer	private
ValidationRuleTypeName	string	private
ValidationConditionalRuleTypeName	string	private
ValidationRuleName	string	private
ValidationErrorMessage	string	private
ValidationPattern	string	private
HasValidated	boolean	private

HasUserSelectedDataApplied Property * 6

Name	Data Type	Accessibility
HasUserSelectedDataApplied	boolean	private

HasValidationPassed Property * 7

Name	Data Type	Accessibility
HasValidationPassed	boolean	private

▪ NextAction Property * ⁸

Name	Data Type	Accessibility
NextAction	string	private

Note(s):

- a) * ¹ **ConstructionApplication** entity contained with client entity, construction type entity, construction group item entity, construction group form field list, "HasUserSelectedDataApplied" property, "HasValidationPassed" property and "NextAction" property.
- b) * ² **Client** entity has all client related data.
- c) * ³ **ConstructionTypeItem** entity has all construction type related data.
- d) * ⁴ **ConstructionGroupItem** entity has all construction group related data.
- e) * ⁵ **ConstructionGroupFormFields** is a collection of **ConstructionGroupFormField** entities.
- f) * ⁶ **HasUserSelectedDataApplied** property will confirm whether user selection has been applied to construction group form fields correctly.
- g) * ⁷ **HasValidationPassed** property will confirm whether user selection has been passed all the validation rules against construction group form fields correctly.
- h) * ⁸ **NextAction** property value shows which API should call next.
- i) * ⁹ **UserInputValue** property is a public property and can be set new value or alter values at any point. Purpose of this property is to set user selected values from construction group form fields for u-value calculations.
- j) * ¹⁰ **ConstructionGroupFormFieldListingItemList** is a collection of **ConstructionGroupFormFieldListingItem** entities. This collection is contained with all the initialization values for any form fields. (e.g., product dropdown lists)
- k) * ¹¹ **ConstructionGroupFormFieldValidationRuleList** is a collection of **ConstructionGroupFormFieldValidationRule** entities. This collection is contained with all the validation rules assigned for form fields. This can be used for validating user inputs.
- l) Accessibility "private" means values can be only access but cannot set new values or alter values.
- m) * ¹² **ConstructionApplicationResult** entity is set to NULL at this stage.

Sample JSON Response

Data type: application/json, text/json

Ref: <https://api.uvaluecalculator.pauleycreative.co.uk/Help/Api/POST-get-all-construction-group-form-field-data-constructionGroupId>

5) <https://api.uvaluecalculator.pauleycreative.co.uk/get-all-final-calculation-results>

Method: POST

Purpose: Submit all the user selected values into application construction form fields and get the full result set after all u-value calculations.

Important: This API call will return the updated result set including validation status of user inputs. If there are any validation errors, check user inputs against the predefined validation rules provided by the API. Once correct the user input data, then call this API again to get the correct result set. Until user inputs satisfy validations rules, the application will not provide a correct result set.

Request Information																																			
Body Parameters																																			
ConstructionApplication Entity																																			
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Icon	string	private																																	
Note	string	private																																	
DisplayOrder	integer	private																																	
NextAction	string	private																																	

- ConstructionGroupItem Entity

ConstructionGroupItem		
Name	Data Type	Accessibility
ConstructionGroupId	integer	private
Name	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupFormFields (Collection of ConstructionGroupFormField entities)

ConstructionGroupFormField		
Name	Data Type	Accessibility
ConstructionGroupFormFieldId	integer	private
ConstructionGroupFormFieldTypeName	string	private
ParentId	integer	private
AssociatedChildControlId	integer	private
ApplicationConstructionGroupLayerTypeId	integer	private
ApplicationLayerName	string	private
ApplicationLayerSpecialNote	string	private
DisplayOrder	integer	private
DefaultVisibility	boolean	private
IsRequiredLayer	boolean	private
HasAssociatedFormFieldListingLayer	boolean	private
HasAssociatedFormFieldOptionLayer	boolean	private
UserInputValue	string	public

ConstructionGroupFormFieldListingItemList (Collection of ConstructionGroupFormFieldListingItem entities)

ConstructionGroupFormFieldListingItem		
Name	Data Type	Accessibility
Id	integer	private
ParentId	integer	private
DisplayValue	string	private
HasChildItems	boolean	private

ConstructionGroupFormFieldValidationRuleList (Collection of ConstructionGroupFormFieldValidationRule entities)

ConstructionGroupFormFieldValidationRule		
Name	Data Type	Accessibility
ValidationRuleId	integer	private
AssociatedConstructionGroupFormFieldId	integer	private
ValidationRuleTypeName	string	private
ValidationConditionalRuleTypeName	string	private
ValidationRuleName	string	private
ValidationErrorMessage	string	private
ValidationPattern	string	private
DisplayOrder	integer	private

ConstructionApplicationResult Entity

ConstructionApplicationResult		
Name	Data Type	Accessibility
ValidationFailed	boolean	private

FinalCalculationResultViewModel Entity

FinalCalculationResultViewModel		
Name	Data Type	Accessibility
ClientID	integer	private
UValue	decimal	private
UpperLimit	decimal	private
LowerLimit	decimal	private
TotalRValue	decimal	private
TotalUf	decimal	private
PARatio	decimal	private
ConstructionGroupId	integer	private

ApplicationLayerResultViewModel (Collection of ApplicationLayerResultViewModel entities)

ApplicationLayerResultViewModel		
Name	Data Type	Accessibility
ApplicationLayerId	integer	private
ApplicationLayerName	string	private
ApplicationLayerValue	string	private
LayerUserSelection	string	private

ApplicationLayerTypeName

LayerType		
Name	Data Type	Accessibility
StaticLayer	integer	private
SingleLayer	integer	private
BridgedLayer	integer	private

BridgeGroup	string	private
ThermalConductivity	decimal	private
Thickness	decimal	private
RValue	decimal	private
HeatPathPercentage	decimal	private
SurfaceEmissivityE1	decimal	private
SurfaceEmissivityE2	decimal	private
HasTimberLayer	boolean	private
DisplayOrder	integer	private

MechanicalFixingViewModel (Collection of MechanicalFixingViewModel entities)

MechanicalFixingViewModel		
Name	Data Type	Accessibility
MechanicalFixingInsulationLayerId	integer	private
MechanicalFixingInsulationLayerName	string	private
MechanicalFixingInsulationLayerValue	string	private
MechanicalFixingInsulationLayerUserSelection	string	private
MechanicalFixingInsulationRValue	decimal	private
MechanicalFixingDepth	decimal	private
MechanicalFixingInfo	string	private
A	decimal	private
Lamdaf	decimal	private
Af	decimal	private
nf	decimal	private
DeltaUf	decimal	private
Rtot	decimal	private
HasMechanicalFixingApplied	boolean	private

AirgapCorrectionViewModel Entity

AirgapCorrectionViewModel		
Name	Data Type	Accessibility
Y	decimal	private
AirGapLevelType	string	private
AirGapLevel	decimal	private
DeltaUf	decimal	private
DeltaUg	decimal	private
RawUValue	decimal	private
TotalCorrection	decimal	private
HasAirgapCorrectionApplied	boolean	private

HeatPathViewModel (Collection of HeatPathViewModel entities)

HeatPathViewModel		
Name	Data Type	Accessibility
TotalRValue	decimal	private
Percentage	decimal	private

LowerLimitViewModel (Collection of LowerLimitViewModel entities)

LowerLimitViewModel		
Name	Data Type	Accessibility
LayerName	string	private
LayerValue	decimal	private

ValidatedApplicationLayerViewModel (Collection of ApplicationLayerViewModel entities)

ApplicationLayerViewModel		
Name	Data Type	Accessibility
ApplicationLayerTypeName	string	private
LayerCount	integer	private

ApplicationLayerMaterialViewModel (Collection of ApplicationLayerMaterialViewModel entities)

ApplicationLayerMaterialViewModel		
Name	Data Type	Accessibility
ApplicationLayerId	integer	private
ApplicationAssociatedChildControlID	integer	private
ApplicationLayerName	string	private
ApplicationLayerValue	string	private
ApplicationLayerType	string	private
ApplicationLayerDefaultThermalConductivityValue	decimal	private
ApplicationLayerDefaultThicknessValue	decimal	private
ApplicationLayerDefaultEmissivityValue	decimal	private
ApplicationLayerDefaultHeatPathPercentageValue	decimal	private
ApplicationLayerDefaultLambdaValue	decimal	private
ApplicationLayerDefaultAlphaValue	decimal	private
ApplicationLayerDefaultnValue	decimal	private
ApplicationLayerDefaultExtraThicknessForAirGap	decimal	private
ApplicationLayerMechanicalFixingInfo	string	private
AllowCalculation	boolean	private
RValue	decimal	private

- HasValidationPassed Property * ⁷

Name	Data Type	Accessibility
HasValidationPassed	boolean	private

- NextAction Property * ⁸

Name	Data Type	Accessibility
NextAction	string	private

Note(s):

- This is the same **ConstructionApplication** entity retrieved from “<https://api.uvaluecalculator.pauleycreative.co.uk/get-all-construction-group-form-field-data/{constructionGroupld}>” API call.

Sample JSON Request Formats

Data type: application/json, text/json

Ref: <https://api.uvaluecalculator.pauleycreative.co.uk/Help/Api/POST-get-all-final-calculation-results>

Response Information

ConstructionApplication Entity * ¹

- Client Entity * ²

Client		
Name	Data Type	Accessibility
ClientId	integer	private
Name	string	private
Introduction	string	private
Logo	string	private

- ConstructionTypeItem Entity * ³

ConstructionTypeItem		
Name	Data Type	Accessibility
ConstructionTypeId	integer	private
Name	string	private
Code	string	private
AirGapType	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupItem Entity * ⁴

ConstructionGroupItem		
Name	Data Type	Accessibility
ConstructionGroupId	integer	private
Name	string	private
Icon	string	private
Note	string	private
DisplayOrder	integer	private
NextAction	string	private

- ConstructionGroupFormFields (Collection of ConstructionGroupFormField entities) * ⁵

ConstructionGroupFormField		
Name	Data Type	Accessibility
ConstructionGroupFormFieldId	integer	private
ConstructionGroupFormFieldTypeName	string	private
ParentId	integer	private
AssociatedChildControlId	integer	private
ApplicationConstructionGroupLayerTypeId	integer	private
ApplicationLayerName	string	private
ApplicationLayerSpecialNote	string	private
DisplayOrder	integer	private
DefaultVisibility	boolean	private
IsRequiredLayer	boolean	private
HasAssociatedFormFieldListingLayer	boolean	private
HasAssociatedFormFieldOptionLayer	boolean	private
UserInputValue * ⁹	string	public
ConstructionGroupFormFieldListingItemList (Collection of ConstructionGroupFormFieldListingItem entities) * ¹⁰		
ConstructionGroupFormFieldListingItem		
Name	Data Type	Accessibility
Id	integer	private
ParentId	integer	private
DisplayValue	string	private
HasChildItems	boolean	private
ConstructionGroupFormFieldValidationRuleList (Collection of ConstructionGroupFormFieldValidationRule entities) * ¹¹		
ConstructionGroupFormFieldValidationRule		
Name	Data Type	Accessibility
ValidationRuleId	integer	private
AssociatedConstructionGroupFormFieldId	integer	private
ValidationRuleTypeName	string	private
ValidationConditionalRuleTypeName	string	private
ValidationRuleName	string	private
ValidationErrorMessage	string	private
ValidationPattern	string	private
DisplayOrder	integer	private

- ConstructionApplicationResult Entity * 12

ConstructionApplicationResult		
Name	Data Type	Accessibility
ValidationFailed	boolean	private
FinalCalculationResultViewModel Entity		
FinalCalculationResultViewModel		
Name	Data Type	Accessibility
ClientID	integer	private
UValue	decimal	private
UpperLimit	decimal	private
LowerLimit	decimal	private
TotalRValue	decimal	private
TotalUf	decimal	private
PARatio	decimal	private
ConstructionGroupID	integer	private
ApplicationLayerResultViewModel (Collection of ApplicationLayerResultViewModel entities)		
ApplicationLayerResultViewModel		
Name	Data Type	Accessibility
ApplicationLayerId	integer	private
ApplicationLayerName	string	private
ApplicationLayerValue	string	private
LayerUserSelection	string	private
ApplicationLayerTypeName		
LayerType		
Name	Data Type	Accessibility
StaticLayer	integer	private
SingleLayer	integer	private
BridgedLayer	integer	private
BridgeGroup	string	private
ThermalConductivity	decimal	private
Thickness	decimal	private
RValue	decimal	private
HeatPathPercentage	decimal	private
SurfaceEmissivityE1	decimal	private
SurfaceEmissivityE2	decimal	private
HasTimberLayer	boolean	private
DisplayOrder	integer	private

MechanicalFixingViewModel (Collection of MechanicalFixingViewModel entities)

MechanicalFixingViewModel

Name	Data Type	Accessibility
MechanicalFixingInsulationLayerId	integer	private
MechanicalFixingInsulationLayerName	string	private
MechanicalFixingInsulationLayerValue	string	private
MechanicalFixingInsulationLayerUserSelection	string	private
MechanicalFixingInsulationRValue	decimal	private
MechanicalFixingDepth	decimal	private
MechanicalFixingInfo	string	private
A	decimal	private
Lamdaf	decimal	private
Af	decimal	private
nf	decimal	private
DeltaUf	decimal	private
Rtot	decimal	private
HasMechanicalFixingApplied	boolean	private

AirgapCorrectionViewModel Entity

AirgapCorrectionViewModel

Name	Data Type	Accessibility
Y	decimal	private
AirGapLevelType	string	private
AirGapLevel	decimal	private
DeltaUf	decimal	private
DeltaUg	decimal	private
RawUValue	decimal	private
TotalCorrection	decimal	private
HasAirgapCorrectionApplied	boolean	private

HeatPathViewModel (Collection of HeatPathViewModel entities)

HeatPathViewModel

Name	Data Type	Accessibility
TotalRValue	decimal	private
Percentage	decimal	private

LowerLimitViewModel (Collection of LowerLimitViewModel entities)

LowerLimitViewModel

Name	Data Type	Accessibility
LayerName	string	private
LayerValue	decimal	private

ValidatedApplicationLayerViewModel (Collection of ApplicationLayerViewModel entities)

ApplicationLayerViewModel

Name	Data Type	Accessibility
ApplicationLayerTypeName	string	private
LayerCount	integer	private

ApplicationLayerMaterialViewModel (Collection of ApplicationLayerMaterialViewModel entities)

ApplicationLayerMaterialViewModel

Name	Data Type	Accessibility
ApplicationLayerId	integer	private
ApplicationAssociatedChildControlID	integer	private
ApplicationLayerName	string	private
ApplicationLayerValue	string	private
ApplicationLayerType	string	private
ApplicationLayerDefaultThermalConductivityValue	decimal	private
ApplicationLayerDefaultThicknessValue	decimal	private
ApplicationLayerDefaultEmissivityValue	decimal	private
ApplicationLayerDefaultHeatPathPercentageValue	decimal	private
ApplicationLayerDefaultLamdaFValue	decimal	private
ApplicationLayerDefaultAfValue	decimal	private
ApplicationLayerDefaultnfValue	decimal	private
ApplicationLayerDefaultExtraThicknessForAirGap	decimal	private
ApplicationLayerMechanicalFixingInfo	string	private
AllowCalculation	boolean	private
RValue	decimal	private
AirGapRValue	decimal	private
SurfaceEmissivityE1	decimal	private
SurfaceEmissivityE2	decimal	private
HasInsulationLayer	boolean	private
HasTargetUValue	boolean	private
HasInsulationInsideLayer	boolean	private
HasTimberLayer	boolean	private
HasTimberSpacingLayer	boolean	private
HasVentilatedLayer	boolean	private
HasBrickLayer	boolean	private

HasPlasterboardLayer	boolean	private
HasExtraDynamicMaterialLayer	boolean	private
HasMechanicalFixLayer	boolean	private
HasLowEmissivityLayer	boolean	private
HasSuspendedFloor	boolean	private
HasRatioLayer	boolean	private
HasRequiredLayer	boolean	private
HasAlternativeMechanicalFixingRule	boolean	private
HasConditionalLayer	boolean	private
HasTimberRafterDepthIgnoreRule	boolean	private
SplitBridgeLayerMaterialIndex	integer	private
LowEmissivityPreviousInsulationLayerID	integer	private
LowEmissivityNextInsulationLayerID	integer	private

ApplicationLayerMaterialValidationRuleViewModel (Collection of ApplicationLayerMaterialValidationRuleViewModel entities)

ApplicationLayerMaterialValidationRuleViewModel		
Name	Data Type	Accessibility
ValidationRuleID	integer	private
FormFieldID	integer	private
AssociatedFormFieldID	integer	private
ValidationRuleTypeName	string	private
ValidationConditionalRuleTypeName	string	private
ValidationRuleName	string	private
ValidationErrorMessage	string	private
ValidationPattern	string	private
HasValidated	boolean	private

- ConstructionApplicationResultByTargetUValue * ¹³
Note: Entity structure same as ConstructionApplicationResult Entity, but list of all possible results based on requested target u-value.
- HasUserSelectedDataApplied Property * ⁶

Name	Data Type	Accessibility
HasUserSelectedDataApplied	boolean	private

- HasValidationPassed Property * ⁷

Name	Data Type	Accessibility
HasValidationPassed	boolean	private

- NextAction Property * ⁸

Name	Data Type	Accessibility
NextAction	string	private

Note(s):

- * ¹ **ConstructionApplication** entity contained with client entity, construction type entity, construction group item entity, construction group form field list, "HasUserSelectedDataApplied" property, "HasValidationPassed" property and "NextAction" property.
- * ² **Client** entity has all client related data.
- * ³ **ConstructionTypeItem** entity has all construction type related data.
- * ⁴ **ConstructionGroupItem** entity has all construction group related data.
- * ⁵ **ConstructionGroupFormFields** is a collection of **ConstructionGroupFormField** entities.
- * ⁶ **HasUserSelectedDataApplied** property will confirm whether user selection has been applied to construction group form fields correctly.
- * ⁷ **HasValidationPassed** property will confirm whether user selection has been passed all the validation rules against construction group form fields correctly.
- * ⁸ **NextAction** property value shows which API should call next.
- * ⁹ **UserInputValue** property is a public property and can be set new value or alter values at any point. Purpose of this property is to set user selected values from construction group form fields for u-value calculations.
- * ¹⁰ **ConstructionGroupFormFieldListingItemList** is a collection of **ConstructionGroupFormFieldListingItem** entities. This collection is contained with all the initialization values for any form fields. (e.g., product dropdown lists)
- * ¹¹ **ConstructionGroupFormFieldValidationRuleList** is a collection of **ConstructionGroupFormFieldValidationRule** entities. This collection is contained with all the validation rules assigned for form fields. This can be used for validating user inputs.
- Accessibility "private" means values can be only access but cannot set new values or alter values.
- * ¹² **ConstructionApplicationResult** entity contain the full u-value calculation results.
- * ¹³ **ConstructionApplicationResultByTargetUValue** entity contain the list of all possible full u-value calculation results.

Sample JSON Response
Data type: application/json, text/json
Ref: https://api.uvaluecalculator.pauleycreative.co.uk/Help/Api/POST-get-all-final-calculation-results