Design: Steel

Design Results

Topics

Design Steel: Chinese Steel Design

Functions

afx_msg long	**OSDesignUI::GetMemberDesignParameters** (long nBriefRef, long nMemberNo, LPDISPATCH pDispatch) Returns the design parameters for specified member in specified design brief.
afx_msg long	**OSDesignUI::CreateDesignBrief** (Code nDesignCode) Creates a new design brief with specified design code. This should then be populated with the necessary design parameters (see the function **OSDesignUI::AssignDesignParameter**) and completed with a design command (see function **OSDesignUI::AssignDesignCommand**).
afx_msg long	**OSDesignUI::AssignDesignParameter** (long nBriefRef, LPCTSTR strParamName, LPCTSTR strParamValue, const VARIANT FAR &varMembers) Assigns Design Parameters to specified Design Brief using Design Command.
afx_msg long	**OSDesignUI::AssignDesignCommand** (long nBriefRef, LPCTSTR strCommandName, LPCTSTR strCommandValue, const VARIANT FAR &varMembers) Design Command.
afx_msg long	**OSDesignUI::AssignDesignGroup** (long nBriefRef, LPCTSTR strCommandName, LPCTSTR strCommandValue, long sameAsMember, const VARIANT FAR &varMembers) Assign physical member(s) to Design Group using Design Command.
afx_msg long	**OSDesignUI::GetDesignBriefCode** (long nBriefRef) Returns the Design Brief Code for specified Design brief.
afx_msg VARIANT	**OSOutputUI::GetMemberDesignSectionName** (const VARIANT FAR &varnBeamNo) Returns the design section name for specified member.
afx_msg VARIANT	**OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable** () This function returns whether steel design results from multiple design block can be extracted or not. If true, then relevant multiple steel design parameters like GetMultipleMemberSteelDesignRatio or GetMultipleMemberSteelDesignResults can be used. Currently, this facility is limited to AISC 360-16 code only. For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.
afx_msg VARIANT	**OSOutputUI::GetSteelDesignParameterBlockCount** () Returns the count of steel design parameter blocks in the model. This function is for AISC 360-16 code only.

afx_msg VARIANT	**OSOutputUI::GetSteelDesignParameterBlockNameByIndex** (const VARIANT FAR &vnIdx, VARIANT FAR &vszParamBlkName) Returns steel design parameter name at the specified index. This function is for AISC 360-16 code only.
afx_msg VARIANT	**OSOutputUI::GetMultipleMemberSteelDesignRatio** (const VARIANT FAR &vszParamBlkName, const VARIANT FAR &vnBeamNo, VARIANT FAR &vfCriticalRatio) Returns the critical steel design ratio for a steel member. This function is for AISC 360-16 code only.
afx_msg VARIANT	**OSOutputUI::GetMultipleMemberSteelDesignMaxRatio** (const VARIANT FAR &vnBeamNo, VARIANT FAR &vfCriticalRatio) Returns the maximum critical steel design ratio across all parameter blocks for a steel member.
afx_msg VARIANT	**OSOutputUI::GetMultipleMemberSteelDesignResults** (const VARIANT FAR &vszParamBlkName, const VARIANT FAR &vnBeamNo, VARIANT FAR &vszDesignCode, VARIANT FAR &vszDesignStatus, VARIANT FAR &vfCriticalRatio, VARIANT FAR &vfAllowableRatio, VARIANT FAR &vnCriticalLoadCase, VARIANT FAR &vszCriticalClause, VARIANT FAR &vszDesignSection) Returns the critical steel design result information for a steel member.
afx_msg VARIANT	**OSOutputUI::GetMemberSteelDesignRatio** (const VARIANT FAR &nBeamNo, VARIANT FAR &vfCriticalRatio) Returns the critical steel design ratio for a steel member. This method will return the results from the last parameter block for which the beam has been designed.
afx_msg VARIANT	**OSOutputUI::GetMemberSteelDesignResults** (const VARIANT FAR &vnBeamNo, VARIANT FAR &vszDesignCode, VARIANT FAR &vszDesignStatus, VARIANT FAR &vfCriticalRatio, VARIANT FAR &vfAllowableRatio, VARIANT FAR &vnCriticalLoadCase, VARIANT FAR &vfCriticalSection, VARIANT FAR &vszCriticalClause, VARIANT FAR &vszDesignSection, VARIANT FAR &vfaDesignForces, VARIANT FAR &vfKLByR) Fetches steel design results for the specified member. This method will return the results from the last parameter block for which the beam has been designed.
afx_msg VARIANT	**OSOutputUI::GetMemberSteelDesignMinFailureRatio** (VARIANT FAR &pdRatio) Fetches the minimum failure ratio across all beams in the model.
afx_msg VARIANT	**OSOutputUI::GetMemberSteelDesignMaxFailureRatio** (VARIANT FAR &pdRatio) Fetches the maximum failure ratio across all beams in the model.

Detailed Description

These functions are related to setting Steel Design Parameters.

Function Documentation

AssignDesignCommand()

```
long OSDesignUI::AssignDesignCommand ( long                nBriefRef,
                                       LPCTSTR             strCommandName,
                                       LPCTSTR             strCommandValue,
                                       const VARIANT FAR & varMembers )
```

protected

Design Command.

Parameters

[in] **nBriefRef** The Design Brief reference ID(Type:Long).

[in] **strCommandName** Design command name(Type:String).

[in] **strCommandValue** Parameter for design command(Type:String).

[in] **varMembers** VARIANT array number ID of Member(s) to be assigned to(Type:Long Array).

Return values

0 Assign Design Command Successful.

-1 Assign Design Command Generate error.

C++ Syntax

```
// Assign Brief #1 with command "CHECK CODE" with no value to an array of members.
long RetVal = OSDesignUI::AssignDesignCommand(1, (LPCTSTR)"CHECK CODE", (LPCTSTR)"",
       varMembers);
```

VBA Syntax

```
Option Explicit
Sub Main
    Dim objOpenStaad As Object
    Dim stdFile As String
    Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
    objOpenStaad.GetSTAADFile stdFile, "TRUE"
    If stdFile="" Then
        MsgBox"Bad"
        Set objOpenStaad = Nothing
        Exit Sub
    End If
    Dim nBriefRef As Integer
    nBriefRef  = objOpenStaad.Design.CreateDesignBrief(1002)
    Dim strCommandName As String
    strCommandName ="CHECK CODE"
    Dim strCommandValue As String
    strCommandValue =""
    Dim Members(1) As Integer
    Members(0) = 1
    Members(1) = 3
    Dim rValue As Integer
    'Assign Brief #1 with command "CHECK CODE" to an array of members.
    rValue = objOpenStaad.Design.AssignDesignCommand(nBriefRef, strCommandName,
       strCommandValue, Members)
    Set objOpenStaad = Nothing
```

```
End Sub
```

AssignDesignGroup()

```
long OSDesignUI::AssignDesignGroup ( long          nBriefRef,
                                     LPCTSTR       strCommandName,
                                     LPCTSTR       strCommandValue,
                                     long          sameAsMember,
                                     const VARIANT FAR & varMembers )
```

protected

Assign physical member(s) to Design Group using Design Command.

Parameters

[in]	**nBriefRef**	Design Brief reference ID(Type:Long).
[in]	**strCommandName**	Name of the command: **scSteelGroup** (= 9987)(Type:String).
[in]	**strCommandValue**	Property Specification: "Ax", "Ay", "Az"(Type:String).
[in]	**sameAsMember**	Reference ID of the beam to represent members in this group for design(Type:Long).
[in]	**varMembers**	Member number ID(s) VARIANT array(Type:Long Array).

Return values

0 OK.

-1 General error.

C++ Syntax

```
// Assign Design Group with Property Specification "Ax", and set to be the same as beam
       #2 in Design brief #1.
long RetVal = OSDesignUI::AssignDesignGroup(1, (LPCTSTR)"scSteelGroup", (LPCTSTR)"2",
       varMembers);
```

VBA Syntax

```
' Assign Design Group with Property Specification "Ax", and set to be the same as beam #2
       in Design brief #1.
Dim RetVal As long = OSDesignUI.AssignDesignGroup(1, "scSteelGroup", "2", varMembers)
```

AssignDesignParameter()

```
long OSDesignUI::AssignDesignParameter ( long                nBriefRef,
                                         LPCTSTR             strParamName,
                                         LPCTSTR             strParamValue,
                                         const VARIANT FAR & varMembers )
```

protected

Assigns Design Parameters to specified Design Brief using Design Command.

Parameters

[in] **nBriefRef** The Design Brief reference ID(Type:Long).

[in] **strParamName** Design command name(Type:String).

[in] **strParamValue** Parameter for design command(Type:String).

[in] **varMembers** Member number ID(s) VARIANT array(Type:Long Array).

Return values

0 Assign Design Parameters Successful.

-1 Assign Design Parameters General error.

C++ Syntax

```
// Assign Brief #1 with command 'TRACK' with value '2' to an array of members.
long RetVal = OSDesignUI::AssignDesignParameter(1, "TRACK", "2", varMembers);
```

VBA Syntax

```
Option Explicit
 Sub Main
     Dim objOpenStaad As Object
     Dim stdFile As String
     Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
     objOpenStaad.GetSTAADFile stdFile, "TRUE"
     If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
     End If
     Dim nBriefRef As Integer
     nBriefRef  = objOpenStaad.Design.CreateDesignBrief(1002)
     Dim strParamName As String
     strParamName ="TRACK"
     Dim strParamValue As String
     strParamValue ="2"
     Dim Members(1) As Integer
     Members(0) = 1
     Members(1) = 3
     Dim rValue As Integer
     ' Assign Brief #1 with command 'TRACK' with value '2' to an array of members.
     rValue = objOpenStaad.Design.AssignDesignParameter(nBriefRef, strParamName,
       strParamValue, Members)
     Set objOpenStaad = Nothing
 End Sub
```

See also

OSDesignUI::GetMemberDesignParameters

◆ CreateDesignBrief()

long OSDesignUI::CreateDesignBrief (Code nDesignCode) protected

Creates a new design brief with specified design code. This should then be populated with the necessary design parameters (see the function **OSDesignUI::AssignDesignParameter**) and completed with a design command (see function **OSDesignUI::AssignDesignCommand**).

Parameters

[in] **nDesignCode** Design Code Index.

nDesignCode	Description	Code Type
1001	AASHTO ASD	Steel Design
1002	AISC ASD	Steel Design
1003	AS 4100-1998	Steel Design
1004	BS 5950-1:2000	Steel Design
1005	BS 5400:Part 3:1982	Steel Design
1006	CAN/CSA-S16-01	Steel Design
1007	French CM66 1977	Steel Design
1008	DIN 18 800 Part 1	Steel Design
1009	IS 800 1984, ASD	Steel Design
1010	Japan AIJ 2002	Steel Design
1011	AISC LRFD	Steel Design
1012	Norway NS 3472 2001	Steel Design
1014	Norway NPD 1993	Steel Design
1016	API 2A-WSD	Steel Design
1020	ASCE 10-97	Steel Design
1025	Russia SNiP 2.23-81* 1990	Steel Design
1027	Canada S136-94	Steel Design
1028	IS 801 1975	Steel Design
1029	IS 802 1995	Steel Design
1030	Mexico NTC 1987	Steel Design
1032	IS 800 2007, LSD	Steel Design
1052	IS 800 2007, WSD	Steel Design
1033	BS 5950-5:1998	Steel Design
1034	South Africa SANS 10162-1:2011	Steel Design
1044	AASHTO LRFD	Steel Design
1045	ANSI/AISC 360-05	Steel Design

1046	ASME NF 3000 1989	Steel Design
1047	ASME NF 3000 1998	Steel Design
1048	ASME NF 3000 1974	Steel Design
1049	ASME NF 3000 1977	Steel Design
1050	Norway NORSOK N-004	Steel Design
1051	ASME NF 3000 2004	Steel Design
1053	ASME NF 3000 2001	Steel Design
1061	ANSI/AISC 360-10	Steel Design
1062	Canadian S16_09	Steel Design
1063	Russia SP 16.13330.2011	Steel Design
1064	South Africa SANS10162-1:1993	Steel Design
1065	Canadian S16_14	Steel Design
1066	NZS3404_1997	Steel Design
1067	ANSI/AISC 360-16	Steel Design
1068	Aisi_S100_2016	Steel Design
1069	Canadian S16_19	Steel Design
1102	AISC CASTELLATED	Steel Design
1202	AISC N690 1994	Steel Design
1204	AISC N690 1984	Steel Design
1210	Japan AIJ 2005	Steel Design
1220	BS EN 1993-1-1:2005	Steel Design
1221	Russia SP 16.13330.2017	Steel Design
2001	ACI 318 2014	Concrete Design
2003	BS 8007	Concrete Design
2004	CAN/CSA A23.3-94	Concrete Design
2007	IS456	Concrete Design
2008	AIJ	Concrete Design
2019	IS13920 2016	Concrete Design
2016	AS 3600	Concrete Design
2020	Mexican	Concrete Design
2022	SABS0100	Concrete Design
2026	ACI 318 2005	Concrete Design
2025	ACI 318 2002	Concrete Design
2024	ACI 318 1999	Concrete Design
2027	ACI 318 2008	Concrete Design

2029	ACI 318 2011	Concrete Design
2030	IS13920 1993	Concrete Design
3001	AITC 1984	Timber Design
3002	AITC 1994	Timber Design
3003	EC5	Timber Design
3004	CSA086-01	Timber Design
4001	Aluminum US	Aluminum Design

Return values

<Val> The reference ID of the design brief created.

-1 General error.

C++ Syntax

```
// Create a new design brief using 1067 (Aisc_Unified_2016).
long nBriefRef = OSDesignUI::CreateDesignBrief(1067);
```

VBA Syntax

```
Option Explicit
 Sub Main
     Dim objOpenStaad As Object
     Dim stdFile As String
     Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
     objOpenStaad.GetSTAADFile stdFile, "TRUE"
     If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
     End If
     Dim nBriefRef As Integer
     ' Create a new design brief using 1067 (AISC 360-16).
     nBriefRef = objOpenStaad.Design.CreateDesignBrief(1067)
     Set objOpenStaad = Nothing
 End Sub
```

See also

OSDesignUI::GetDesignBriefCode

◆ GetDesignBriefCode()

long OSDesignUI::GetDesignBriefCode (long nBriefRef) protected

Returns the Design Brief Code for specified Design brief.

Parameters

[in] **nBriefRef** Design Brief reference ID.

Return values

<Val> The design brief code in long integer.

0 STAAD Design Brief Not Found.

C++ Syntax

```
// Get Design Brief Code for Design Brief #1.
long nDesignCode = OSDesignUI::GetDesignBriefCode(1);
```

VBA Syntax

```
' Get Design Brief Code for Design Brief #1.
Dim nDesignCode As long = OSDesignUI.GetDesignBriefCode(3)
```

See also

OSDesignUI::CreateDesignBrief

◆ GetMemberDesignParameters()

long OSDesignUI::GetMemberDesignParameters (long nBriefRef,
long nMemberNo,
LPDISPATCH pDesignParams) protected

Returns the design parameters for specified member in specified design brief.

Parameters

[in] **nBriefRef** The Design Brief reference ID.

[in] **nMemberNo** Member number ID.

[out] **pDesignParams** Design parameters:Name, Value, Unit, Description, Default.

Return values

0 OK.

-1 General error.

C++ Syntax

```
// Get design parameters defined in Design Brief #1 for member #2.
long RetVal = OSDesignUI::GetMemberDesignParameters(1, 2, pDesignParams);
```

VBA Syntax

```
Option Explicit

    Sub Main
        Dim objOpenStaad As Object
        Dim stdFile As String

        Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
        objOpenStaad.GetSTAADFile stdFile, "TRUE"
        If stdFile="" Then
            MsgBox"Bad"
            Set objOpenStaad = Nothing
            Exit Sub
        End If

        Dim params As Object

        Set params = CreateObject("StaadPro.MembSteelDgnParams")

        ' Get design parameters defined in Design Brief #0 for member #2.
        objOpenStaad.Design.GetMemberDesignParameters 0, 2, params

        MsgBox ("Total Parameter Count is " & params.Count)
        MsgBox ("The Value of Parameter " & params.Name(2) & " is " & params.Value(2))
        MsgBox"Macro Ending"
        Set objOpenStaad = Nothing
    End Sub
```

See also

OSDesignUI::AssignDesignParameter

GetMemberDesignSectionName()

VARIANT OSOutputUI::GetMemberDesignSectionName (const VARIANT FAR & varnBeamNo)

Returns the design section name for specified member.

Parameters

[in] **varnBeamNo** Member number ID.

Return values

Returns design section name for the specified member. Returns empty string if not found.

VBA Syntax

```
'Get the section name for member #4.
Sub MemberDesignSectionName()
  Dim memb As Long
  Dim RetVal As Variant

'Launch OpenSTAAD Object
On Error GoTo ErrHandler
  Set objOpenSTAAD = GetObject(, "StaadPro.OpenSTAAD")

'Is Analysis Completed
  Cells(1, 2).Value = objOpenSTAAD.Output.AreResultsAvailable()

'Member Design Section Name
  memb = Cells(34, 1).Value 'Member ID = 4
  RetVal = objOpenSTAAD.Output.GetMemberDesignSectionName(memb)
  MsgBox (RetVal & vbCrLf)

Set objOpenSTAAD = Nothing
Exit Sub

ErrHandler:
  MsgBox ("Run StaadPro First" & vbCrLf)
Resume Next
End Sub
```

GetMemberSteelDesignMaxFailureRatio()

VARIANT OSOutputUI::GetMemberSteelDesignMaxFailureRatio (VARIANT FAR & pdRatio)

Fetches the maximum failure ratio across all beams in the model.

Parameters

[out] **pdRatio** The maximum failure ratio.

Returns

true if maximum ratio can be obtained successfully otherwise false.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "Tutorial 1 - Steel Portal Frame.std" file
        from the Tutorials folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

       Dim maxCriticalRatio As Double

       ' now call method GetMemberSteelDesignMaxFailureRatio
       varReturnVal =
        objOpenStaad.Output.GetMemberSteelDesignMaxFailureRatio(maxCriticalRatio)

       ' process the return value
       If varReturnVal > 0 Then
         MsgBox"Query design ratio is successful"
       Else
         MsgBox"Query design ratio is unsuccessful"
       End If

       Set objOpenStaad = Nothing
    End Sub
```

- GetMemberSteelDesignMinFailureRatio()

VARIANT OSOutputUI::GetMemberSteelDesignMinFailureRatio (VARIANT FAR & pdRatio)

Fetches the minimum failure ratio across all beams in the model.

Parameters

[out] **pdRatio** The minimum failure ratio.

Returns

true if minimum ratio can be obtained successfully otherwise false.

VBA Syntax

```
Option Explicit

   Sub Main
      Dim objOpenStaad As Object
      Dim stdFile As String
      Dim varReturnVal As Long

      ' launch STAAD.Pro application and open "Tutorial 1 - Steel Portal Frame.std" file
       from the Tutorials folder

      Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
      objOpenStaad.GetSTAADFile stdFile, "TRUE"
      If stdFile="" Then
        MsgBox"Bad"
        Set objOpenStaad = Nothing
        Exit Sub
      End If

      ' perform analysis and design the model and wait for finish
      varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

      ' Check if results are available or not
      If objOpenStaad.Output.AreResultsAvailable = 0 Then
          MsgBox "Results Unavailable"
          Set objOpenStaad = Nothing
          Exit Sub
      End If

      Dim minCriticalRatio As Double

      ' now call method GetMemberSteelDesignMinFailureRatio
      varReturnVal =
       objOpenStaad.Output.GetMemberSteelDesignMinFailureRatio(minCriticalRatio)

      ' process the return value
      If varReturnVal > 0 Then
        MsgBox"Query design ratio is successful"
      Else
        MsgBox"Query design ratio is unsuccessful"
      End If

      Set objOpenStaad = Nothing
   End Sub
```

- GetMemberSteelDesignRatio()

VARIANT OSOutputUI::GetMemberSteelDesignRatio (const VARIANT FAR & vnBeamNo,
VARIANT FAR & vfCriticalRatio)

Returns the critical steel design ratio for a steel member. This method will return the results from the last parameter block for which the beam has been designed.

Parameters

[in] **vnBeamNo** Beam number ID.

[out] **vfCriticalRatio** Returns the critical steel design ratio. Returns -999 if analysis is performed but the member is not designed. Returns -1 if analysis is not performed.

Returns

Returns true if ratio for the specified member is obtained successfully otherwise false.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "Tutorial 1 - Steel Portal Frame.std" file
        from the Tutorials folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

       Dim criticalRatio As Double

       ' now call method GetMemberSteelDesignRatio
       varReturnVal = objOpenStaad.Output.GetMemberSteelDesignRatio(2, criticalRatio)

       ' process the return value
       If varReturnVal > 0 Then
         MsgBox"Query design ratio is successful"
       Else
         MsgBox"Query design ratio is unsuccessful"
       End If
```

```
    Set objOpenStaad = Nothing
End Sub
```

GetMemberSteelDesignResults()

```
VARIANT OSOutputUI::GetMemberSteelDesignResults ( const VARIANT FAR & vnBeamNo,
                                                  VARIANT FAR &       vszDesignCode,
                                                  VARIANT FAR &       vszDesignStatus,
                                                  VARIANT FAR &       vfCriticalRatio,
                                                  VARIANT FAR &       vfAllowableRatio,
                                                  VARIANT FAR &       vnCriticalLoadCase,
                                                  VARIANT FAR &       vfCriticalSection,
                                                  VARIANT FAR &       vszCriticalClause,
                                                  VARIANT FAR &       vszDesignSection,
                                                  VARIANT FAR &       vfaDesignForces,
                                                  VARIANT FAR &       vfKLByR )
```

Fetches steel design results for the specified member. This method will return the results from the last parameter block for which the beam has been designed.

Parameters

[in]	**vnBeamNo**	Id of the member for which design results should be retrieved.
[out]	**vszDesignCode**	The design code name
[out]	**vszDesignStatus**	The design status (PASS or FAIL will be returned)
[out]	**vfCriticalRatio**	The design utilization ratio.
[out]	**vfAllowableRatio**	The allowable design utilization ratio.
[out]	**vnCriticalLoadCase**	The critical design load case number.
[out]	**vfCriticalSection**	The critical section location from the start of member in current base unit.
[out]	**vszCriticalClause**	The critical design clause.
[out]	**vszDesignSection**	The design section name.
[out]	**vfaDesignForces**	Array of size 3 and type double to hold critical section forces. Returns FX, MY and MZ values at 0, 1, & 2 index respectively in current base units.
[out]	**vfKLByR**	KL/R ratio of the specified member

Returns

true if design results can be obtained successfully otherwise false.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "Tutorial 1 - Steel Portal Frame.std" file
        from the Tutorials folder
```

```
    Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
    objOpenStaad.GetSTAADFile stdFile, "TRUE"
    If stdFile="" Then
      MsgBox"Bad"
      Set objOpenStaad = Nothing
      Exit Sub
    End If

    ' perform analysis and design the model and wait for finish
    varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

    ' Check if results are available or not
    If objOpenStaad.Output.AreResultsAvailable = 0 Then
        MsgBox "Results Unavailable"
        Set objOpenStaad = Nothing
        Exit Sub
    End If

    Dim designCode As String
    Dim designStatus As String
    Dim criticalRatio As Double
    Dim allowableRatio As Double
    Dim criticalLoadCase As Long
    Dim criticalSection As Double
    Dim criticalClause As String
    Dim designSection As String
    Dim designForces(2) As Double
    Dim KLByR As Double

    Dim memberNo As Long
    memberNo = 2

    ' now call method GetMemberSteelDesignResults
    varReturnVal = objOpenStaad.Output.GetMemberSteelDesignResults(memberNo,
     designCode, designStatus, criticalRatio, allowableRatio, criticalLoadCase,
     criticalSection, criticalClause, designSection, designForces, KLByR)

    Dim resultMessage As String
    resultMessage = "code: " & designCode & " status: " & designStatus & " ratio: " &
     criticalRatio & vbCrLf & _
                 "FX: " & designForces(0) & " MY: " & designForces(1) & " MZ: " &
     designForces(2) & " KL/R: " & KLByR

    MsgBox resultMessage

    ' process the return value
    If varReturnVal > 0 Then
      MsgBox"Query of design results is successful"
    Else
      MsgBox"Query of design results is unsuccessful"
    End If

    Set objOpenStaad = Nothing
End Sub
```

◆ GetMultipleMemberSteelDesignMaxRatio()

VARIANT OSOutputUI::GetMultipleMemberSteelDesignMaxRatio (const VARIANT FAR & vnBeamNo,
VARIANT FAR & vfCriticalRatio)

Returns the maximum critical steel design ratio across all parameter blocks for a steel member.

Parameters

[in] **vnBeamNo** Beam number ID.

[out] **vfCriticalRatio** Returns the maximum critical steel design ratio.

Returns

Returns true if ratio for the specified member is obtained successfully otherwise false.

Remarks

For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "US-1 Plane Frame with Steel Design.std"
        file from the Samples Models\US folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

        ' now call method IsMultipleMemberSteelDesignResultsAvailable
        varReturnVal = objOpenStaad.Output.IsMultipleMemberSteelDesignResultsAvailable
        If varReturnVal = 0 Then
          MsgBox"Multiple design results is not available"
           Set objOpenStaad = Nothing
           Exit Sub
        End If

       Dim criticalRatio As Double
```

```
    Dim memberNo As Long

    memberNo = 2

    ' now call method GetMultipleMemberSteelDesignMaxRatio
    varReturnVal = objOpenStaad.Output.GetMultipleMemberSteelDesignMaxRatio(memberNo,
     criticalRatio)

    ' process the return value
    If varReturnVal > 0 Then
      MsgBox ("max ratio: " & criticalRatio)
    Else
      MsgBox"Query of maximum design ratio is unsuccessful"
    End If

    Set objOpenStaad = Nothing
End Sub
```

See also

OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable

◆ GetMultipleMemberSteelDesignRatio()

VARIANT OSOutputUI::GetMultipleMemberSteelDesignRatio (const VARIANT FAR & vszParamBlkName,
const VARIANT FAR & vnBeamNo,
VARIANT FAR & vfCriticalRatio)

Returns the critical steel design ratio for a steel member. This function is for AISC 360-16 code only.

Parameters

[in]	**vszParamBlkName**	Steel design parameter block name.
[in]	**vnBeamNo**	Beam number ID.
[out]	**vfCriticalRatio**	Returns the critical steel design ratio.

Returns

Returns true if ratio for the specified member is obtained successfully otherwise false.

Remarks

For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "US-1 Plane Frame with Steel Design.std"
        file from the Samples Models\US folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

        ' now call method IsMultipleMemberSteelDesignResultsAvailable
        varReturnVal = objOpenStaad.Output.IsMultipleMemberSteelDesignResultsAvailable
        If varReturnVal = 0 Then
          MsgBox"Multiple design results is not available"
           Set objOpenStaad = Nothing
           Exit Sub
```

```
        End If

    Dim criticalRatio As Double

    ' get results for all parameter blocks
    Dim i As Long
    Dim countOfParamBlocks As Long
    countOfParamBlocks = objOpenStaad.Output.GetSteelDesignParameterBlockCount()
    MsgBox ("count of parameter blocks: " & countOfParamBlocks)

    Dim paramBlockName As String
    Dim memberNo As Long

    memberNo = 2
    For i = 0 To (countOfParamBlocks - 1)

        ' get the param block name
        varReturnVal = objOpenStaad.Output.GetSteelDesignParameterBlockNameByIndex(i,
    paramBlockName)

        ' now call method GetMultipleMemberSteelDesignRatio
        If varReturnVal > 0 Then
            varReturnVal =
    objOpenStaad.Output.GetMultipleMemberSteelDesignRatio(paramBlockName, memberNo,
    criticalRatio)
        End If

        ' process the return value
        If varReturnVal > 0 Then
          MsgBox ("param: " & paramBlockName & "ratio: " & criticalRatio)
        Else
          MsgBox"Query of design ratio is unsuccessful"
        End If

    Next

    Set objOpenStaad = Nothing
End Sub
```

See also

OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable

OSOutputUI::GetSteelDesignParameterBlockCount

OSOutputUI::GetSteelDesignParameterBlockNameByIndex

◆ GetMultipleMemberSteelDesignResults()

```
VARIANT OSOutputUI::GetMultipleMemberSteelDesignResults ( const VARIANT FAR & vszParamBlkName,
                                                          const VARIANT FAR & vnBeamNo,
                                                          VARIANT FAR &       vszDesignCode,
                                                          VARIANT FAR &       vszDesignStatus,
                                                          VARIANT FAR &       vfCriticalRatio,
                                                          VARIANT FAR &       vfAllowableRatio,
                                                          VARIANT FAR &       vnCriticalLoadCase,
                                                          VARIANT FAR &       vszCriticalClause,
                                                          VARIANT FAR &       vszDesignSection )
```

Returns the critical steel design result information for a steel member.

Parameters

[in]	**vszParamBlkName**	Steel design parameter block name. See **OSOutputUI::GetSteelDesignParameterBlockNameByIndex**
[in]	**vnBeamNo**	Member number ID.
[out]	**vszDesignCode**	The design code name
[out]	**vszDesignStatus**	The design status (PASS or FAIL will be returned)
[out]	**vfCriticalRatio**	The design utilization ratio.
[out]	**vfAllowableRatio**	The allowable design utilization ratio.
[out]	**vnCriticalLoadCase**	The critical design load case number.
[out]	**vszCriticalClause**	The critical design clause.
[out]	**vszDesignSection**	The design section name.

Returns

Returns true if results for the specified member is obtained successfully otherwise false.

Remarks

For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "US-1 Plane Frame with Steel Design.std"
        file from the Samples Models\US folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
```

```
  MsgBox"Bad"
  Set objOpenStaad = Nothing
  Exit Sub
End If

' perform analysis and design the model and wait for finish
varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

' Check if results are available or not
If objOpenStaad.Output.AreResultsAvailable = 0 Then
    MsgBox "Results Unavailable"
    Set objOpenStaad = Nothing
    Exit Sub
End If

 ' now call method IsMultipleMemberSteelDesignResultsAvailable
 varReturnVal = objOpenStaad.Output.IsMultipleMemberSteelDesignResultsAvailable
 If varReturnVal = 0 Then
   MsgBox"Multiple design results is not available"
    Set objOpenStaad = Nothing
    Exit Sub
 End If

Dim designCode As String
Dim designStatus As String
Dim criticalRatio As Double
Dim allowableRatio As Double
Dim criticalLoadCase As Long
Dim criticalClause As String
Dim designSection As String

' get results for all parameter blocks
Dim i As Long
Dim countOfParamBlocks As Long
countOfParamBlocks = objOpenStaad.Output.GetSteelDesignParameterBlockCount()
MsgBox ("count of parameter blocks: " & countOfParamBlocks)

Dim paramBlockName As String
Dim memberNo As Long

memberNo = 2
For i = 0 To (countOfParamBlocks - 1)

    ' get the param block name
    varReturnVal = objOpenStaad.Output.GetSteelDesignParameterBlockNameByIndex(i,
 paramBlockName)

    ' now call method GetMultipleMemberSteelDesignResults
    If varReturnVal > 0 Then
         varReturnVal =
 objOpenStaad.Output.GetMultipleMemberSteelDesignResults(paramBlockName, memberNo,
 designCode, designStatus, criticalRatio, allowableRatio, criticalLoadCase,
 criticalClause, designSection)
    End If

    ' process the return value
    If varReturnVal > 0 Then
      MsgBox ("param: " & paramBlockName & " code: " & designCode & " status: " &
 designStatus & " ratio: " & criticalRatio)
    Else
      MsgBox"Query of design results is unsuccessful"
    End If
```

```
        Next

        Set objOpenStaad = Nothing
    End Sub
```

See also

OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable

OSOutputUI::GetSteelDesignParameterBlockCount

OSOutputUI::GetSteelDesignParameterBlockNameByIndex

OSOutputUI::GetMultipleMemberSteelDesignRatio

OSOutputUI::GetMultipleMemberSteelDesignMaxRatio

◆ GetSteelDesignParameterBlockCount()

VARIANT OSOutputUI::GetSteelDesignParameterBlockCount ( )

Returns the count of steel design parameter blocks in the model. This function is for AISC 360-16 code only.

Returns

Returns the count of steel design parameter blocks.

Remarks

For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "US-1 Plane Frame with Steel Design.std"
        file from the Samples Models\US folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

        ' now call method IsMultipleMemberSteelDesignResultsAvailable
        varReturnVal = objOpenStaad.Output.IsMultipleMemberSteelDesignResultsAvailable
        If varReturnVal = 0 Then
          MsgBox"Multiple design results is not available"
           Set objOpenStaad = Nothing
           Exit Sub
        End If

       ' get results for all parameter blocks
       Dim countOfParamBlocks As Long
       countOfParamBlocks = objOpenStaad.Output.GetSteelDesignParameterBlockCount()
       MsgBox ("count of parameter blocks: " & countOfParamBlocks)

       Set objOpenStaad = Nothing
    End Sub
```

See also

OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable

OSOutputUI::GetSteelDesignParameterBlockNameByIndex

GetSteelDesignParameterBlockNameByIndex()

VARIANT
OSOutputUI::GetSteelDesignParameterBlockNameByIndex (const VARIANT FAR & vnIdx,
VARIANT FAR & vszParamBlkName)

Returns steel design parameter name at the specified index. This function is for AISC 360-16 code only.

Parameters

[in] **vnIdx** The index value of steel design parameter block list. Note, the index is zero based.

[out] **vszParamBlkName** Steel design parameter block name

Returns

Returns true if successful, false otherwise.

Remarks

For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "US-1 Plane Frame with Steel Design.std"
        file from the Samples Models\US folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

        ' now call method IsMultipleMemberSteelDesignResultsAvailable
        varReturnVal = objOpenStaad.Output.IsMultipleMemberSteelDesignResultsAvailable
        If varReturnVal = 0 Then
          MsgBox"Multiple design results is not available"
           Set objOpenStaad = Nothing
           Exit Sub
```

```
        End If

        ' get results for all parameter blocks
        Dim i As Long
        Dim countOfParamBlocks As Long
        countOfParamBlocks = objOpenStaad.Output.GetSteelDesignParameterBlockCount()
        MsgBox ("count of parameter blocks: " & countOfParamBlocks)

        Dim paramBlockName As String
        For i = 0 To (countOfParamBlocks - 1)

            ' get the param block name
            varReturnVal = objOpenStaad.Output.GetSteelDesignParameterBlockNameByIndex(i,
        paramBlockName)

            ' process the return value
            If varReturnVal > 0 Then
              MsgBox ("param: " & paramBlockName)
            Else
              MsgBox"Query of parameter block name is unsuccessful"
            End If

        Next

        Set objOpenStaad = Nothing
    End Sub
```

See also

OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable

OSOutputUI::GetSteelDesignParameterBlockCount

◆ IsMultipleMemberSteelDesignResultsAvailable()

VARIANT OSOutputUI::IsMultipleMemberSteelDesignResultsAvailable ( )

This function returns whether steel design results from multiple design block can be extracted or not. If true, then relevant multiple steel design parameters like GetMultipleMemberSteelDesignRatio or GetMultipleMemberSteelDesignResults can be used. Currently, this facility is limited to AISC 360-16 code only. For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

Returns

Returns TRUE (for Boolean variable, for Long variable, return value is 1) if result extraction from multiple steel design block is possible (i.e. AISC 360-16 code is used). Else the return value will be FALSE (0 for Long variable).

Remarks

For further details, please check RR 22.02.00-4.2 of STAAD.Pro Help manual.

VBA Syntax

```
Option Explicit

    Sub Main
       Dim objOpenStaad As Object
       Dim stdFile As String
       Dim varReturnVal As Long

       ' launch STAAD.Pro application and open "US-1 Plane Frame with Steel Design.std"
        file from the Samples Models\US folder

       Set objOpenStaad = GetObject(,"StaadPro.OpenSTAAD")
       objOpenStaad.GetSTAADFile stdFile, "TRUE"
       If stdFile="" Then
         MsgBox"Bad"
         Set objOpenStaad = Nothing
         Exit Sub
       End If

       ' perform analysis and design the model and wait for finish
       varReturnVal = objOpenStaad.AnalyzeEx(1, 0, 1)

       ' Check if results are available or not
       If objOpenStaad.Output.AreResultsAvailable = 0 Then
           MsgBox "Results Unavailable"
           Set objOpenStaad = Nothing
           Exit Sub
       End If

        ' now call method IsMultipleMemberSteelDesignResultsAvailable
        varReturnVal = objOpenStaad.Output.IsMultipleMemberSteelDesignResultsAvailable
        If varReturnVal = 0 Then
          MsgBox"Multiple design results is not available"
           Set objOpenStaad = Nothing
           Exit Sub
        End If

       Set objOpenStaad = Nothing
```

```
End Sub
```