Strand7 R24 to R3 API Conversion Guide

Introduction

This document is a guide for converting a Strand7 R2.4 API (R24) program to run with the Strand7 R3.1.7 API (R3).

Compatibility

The R3 API is a 64-bit Windows DLL that can only be called from 64-bit applications. It is not possible for a 32-bit program to call functions inside a 64-bit DLL. To link to the R3 API it is necessary to compile for "64-bit" or the "x64 platform". Developers using Excel VBA, Python or MATLAB must use 64-bit versions.

The R3 API is not 100% backward compatible with previous API releases. Since all program code must be recompiled for 64-bit, the decision was made to take this opportunity to update the API interface to better reflect the R3 workflow and feature set.

Model Window

The R3 API provides three different modes of operation for refreshing the model window; the mode is set via the function `St7SetModelWindowRefresh`.

In auto-refresh mode (`wrAutoRefresh`), the model window remains synchronised with the model, automatically refreshing as changes are made. For example, if new elements are inserted, the model window will refresh automatically as each element is added.

In pause-clear (`wrPauseClear`) and pause-no-clear (`wrPauseNoClear`) modes, the model window remains responsive until a user action or API call invalidates it. While the model window is valid it can respond to view changes and/or window resizes. Once the model window is invalidated, the window is not updated until either `St7RedrawModel` is called (which performs a one-off synchronisation), or the mode is changed to auto-refresh mode (which performs and maintains synchronisation).

The difference between `wrPauseClear` and `wrPauseNoClear` modes is in what is displayed in an invalidated model window. An invalidated model window will be cleared with `wrPauseClear`, whereas it will continue to display the previous graphics with `wrPauseNoClear`, even if the previous graphics are out of date with the current state of the model. The advantage of `wrPauseNoClear` is that it avoids a screen flicker that can occur when the window is cleared between pausing it and refreshing it after the model has changed. Both modes will disable interaction with the model window (such as the Entity Inspector and selecting).

API calls will take longer to perform with the `wrAutoRefresh` mode since more work is required to continually update the model window in response to model changes.

Frequent updates to the status bar can also impact program performance. To address this, the function `St7SetStatusBarUpdateMode` is provided, which allows updates to the status bar to be suspended and resumed.

Tools

All of the tools in Strand7, accessible from the **VISUAL/Tools** tab, are available in the R3 API. In the R24 API, only a few of those tool functions are available.

The API tool functions work similarly to how they work in the Strand7 graphical user interface. The API workflow is as follows:

1. The entities that are to be operated upon by the tool function are selected using the entity selection functions (e.g., `St7SetEntitySelectState`).
2. State variables corresponding to the dialog options relevant to the tool function are set and updated by calling the relevant functions (e.g., `St7SetKeepSelect` for the **Keep selected** dialog option).
3. The tool function is called to do the work.

Using state variables for dialog options common to multiple tools means that the options do not need to be specified every time a tool is called. The functions to set state variables only need to be called when the state needs to be initialised or changed. The API manual documents the state variables that apply to each tool function.

Tools, when executed in Strand7, show a message on completion giving the number of entities affected by the operation. In the API, this information is stored in a global array whose values can be obtained by calling the function `St7GetGlobalIntegerValue` with a global integer index. For example, requesting index value `ivBeamsDeleted` will return the number of beams deleted by the tool.

Markers

The R3 API introduces a new set of functions that can be used for basic annotation of entities within the model window (`St7SetMarker`, `St7ShowMarker` and `St7HideMarker`, amongst others). See the API manual for more information.

R3 DLL Solver

The R3 API introduces a DLL version of the solver (in addition to the EXE version). The DLL version is advantageous for API projects that need to run the solver hundreds or thousands of times on relatively small models (e.g., optimisation applications). Once loaded, the DLL remains memory resident, so the time to launch the next solve is usually measurably less compared with loading the EXE version of the solver each time. See `St7SetUseSolverDLL` in the API manual.

Results Contour File

A new set of functions, including `St7GeneratePlateContourFile`, `St7LoadPlateContourFile` and `St7GetPlateContourFileResult`, provide a more efficient way to extract plate and brick element results when nodal averaged results are required over all, or most, of the elements in the model. Using contour files, the results are pre-calculated and stored for faster retrieval. See the API manual for more information.

Steps for converting an R24 API program to run with the R3 API

Step 1: Change to 64-bit target.

Your compiler needs to produce a 64-bit target to use the R3 API.

Step 2: Replace the header files.

To use the R3 API functions, the R24 API header files contained in your project need to be replaced with the R3 header files. This will change the function signatures.

Step 3: Consult Appendix 1 and replace functions.

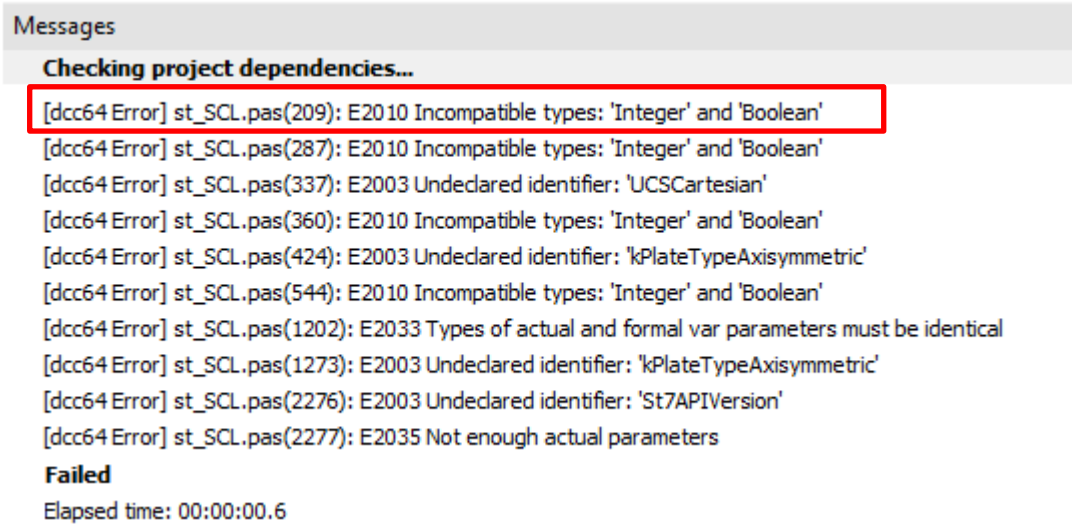
Appendix 1 contains the list of R24 functions that are not available in R3 and suggests their replacement. The R3 API Manual provides information about the new functions.

Step 4: Consult Appendix 2 and replace constants.

Appendix 2 contains the list of R24 constants that are not available in R3 and suggests their replacement. The R3 API Manual will provide more information about each of the constants.

Step 5: Use the compiler to find functions with parameter changes.

After replacing function calls and constants, an attempt can be made to compile the program. The compiler will report errors for R24 functions whose parameters have changed in R3. For each compiler error, consult Appendix 3, which provides information about the changes. Refer to the R3 API manual for more information.



For example, the first error (on line 209) is due to an incompatible type error, whereby an integer is expected but a boolean is passed. Looking at the function call in the code we have:

```
St7OpenResultFile(Id, FileName, '', true, NumPrimary, NumSecondary)
```

We see that the R24 signature for `St7OpenResultsFile` is as follows:

```
St7OpenResultFile(long uID, char* FileName, char* SpectralName, bool Combinations,
long* NumPrimary, long* NumSecondary)
```

By consulting Appendix 3, we can see that there is a change to the `Combinations/CombinationCode` argument.

The R3 signature from the API manual confirms this:

```
St7OpenResultFile(long uID, char* FileName, char* SpectralName, long CombinationCode,
long* NumPrimary, long* NumSecondary)
```

From the R3 API manual, the new constants to provide as input for the `CombinationCode` argument are:

- `kNoCombinations` – no combinations.
- `kGenerateNewCombinations` – generate new combinations.
- `kUseExistingCombinations` – open previously saved combinations if a valid .LSC file exists, otherwise,

generate the combinations.

Each compilation error can be addressed in this way until a clean compile is successfully obtained.

Step 6: Consult Appendix 4 and modify parameters.

Up to this point, it is relatively easy to make the appropriate conversions, and with this we have a compiled program. The next important step is to edit the functions whose argument list types have not changed, but where the meaning of one or more of the arguments has changed. The way to do this is to consult Appendix 4 to check whether your program uses any of the functions listed. For each function, take note of the change description, consult the R3 API manual, and modify your code.

Step 7: Consult Appendix 5 and update constants.

This step is only required if your code contains hard-coded constants (i.e., numeric literals) instead of using the named constants provided in the API header files. It is good programming practice to use named constants instead of hard-coded literals. If your code uses hard-coded literals, the task of replacing these with the correct named constants is likely to be a laborious one.

Appendix 1 – R24 functions not available in R3

The table below lists R24 API functions that are not available in the R3 API. Where applicable, alternative functions are provided, or an explanation for their removal is given. Where an alternative function is not given, it means that the R24 function has no purpose in R3. For example, `St7DisableSeismicNSMassCase` is no longer relevant because seismic load cases in R3 all have their own non-structural mass attributes.

R24 Function	R3 Function to Use/Comment
St7AddSRADirectionVector	St7AddSRABaseCase
St7APIVersion	St7Version, St7BuildString
St7DeleteInvalidGeometryFaces	St7DeleteInvalidGeometry
St7DeleteSeismicCase	St7DeleteLoadCase
St7DeleteSRADirectionVector	St7DeleteSRABaseCase
St7DisableAutoAssignPathDivisions	St7SetMovingLoadAutoDivisions
St7DisableLSAInitialPCGFile	St7DisableInitialPCGFile
St7DisableNFANonStructuralMassCase	St7DisableNSMassCaseInMassMatrix
St7DisableSeismicNSMassCase	* Seismic cases in R3 define their own non-structural mass attributes.
St7EnableAutoAssignPathDivisions	St7SetMovingLoadAutoDivisions
St7EnableLSAInitialPCGFile	St7EnableInitialPCGFile
St7EnableNFANonStructuralMassCase	St7EnableNSMassCaseInMassMatrix
St7EnableSeismicNSMassCase	* Seismic cases in R3 define their own non-structural mass attributes.
St7ExportANSYSFile	St7ExportANSYS
St7ExportDXFFile	St7ExportDXF
St7ExportIGESFile	St7ExportIGES
St7ExportImageFile	St7ExportImage
St7ExportNASTRANFile	St7ExportNASTRAN
St7ExportST7File	St7ExportST7
St7ExportSTEPFile	St7ExportSTEP
St7GetBeamAxisSystem	St7GetBeamAxisSystemInitial, St7GetBeamAxisSystemBirth, St7GetBeamAxisSystemGNL
St7GetBeamCFG4ID	St7GetBeamPointForceGlobal4ID
St7GetBeamCFL4ID	St7GetBeamPointForcePrincipal4ID
St7GetBeamCMG4ID	St7GetBeamPointMomentGlobal4ID
St7GetBeamCML4ID	St7GetBeamPointMomentPrincipal4ID
St7GetBeamDLG6ID	St7GetBeamDistributedForceGlobal6ID
St7GetBeamDLL6ID	St7GetBeamDistributedForcePrincipal6ID
St7GetBeamDML6ID	St7GetBeamDistributedMomentPrincipal6ID
St7GetBeamSupport2F	St7GetBeamSupport2
St7GetBeamUseMomCurv	St7GetBeamNonlinearMode
St7GetBrickFaceAxisSystem	St7GetBrickFaceAxisSystemInitial, St7GetBrickFaceAxisSystemBirth, St7GetBrickFaceAxisSystemGNL
St7GetBrickNSMass5	St7GetBrickNSMass5ID
St7GetBrickPropertyData	* See “Properties – Beams, Plates and Bricks” in API Manual.
St7GetBrickResultUserEquation	St7GetResultUserEquation
St7GetBrickSupport1F	St7GetBrickSupport4
St7GetBuckFactor	St7GetBucklingFactor

R24 Function	R3 Function to Use/Comment
St7GetCleanGeometryData	St7GetCleanGeometryOptions
St7GetCleanMeshData	St7GetCleanMeshOptions
St7GetEntityDisplay	* See “Entity Display” in API Manual.
St7GetFrequencyTable	St7GetFrequencyPeriodTableType
St7GetGeometryEdgeAttachment1	St7GetGeometryCoedgeAttachment1
St7GetGeometryEdgeConvection2	St7GetGeometryCoedgeConvection2
St7GetGeometryEdgeConvectionTables	St7GetGeometryCoedgeConvectionTables
St7GetGeometryEdgeFlux1	St7GetGeometryCoedgeFlux1
St7GetGeometryEdgeFluxTables	St7GetGeometryCoedgeFluxTables
St7GetGeometryEdgeNormalShear1	St7GetGeometryCoedgeTransverseShear1
St7GetGeometryEdgePressure1	St7GetGeometryCoedgePressure1
St7GetGeometryEdgeRadiation2	St7GetGeometryCoedgeRadiation2
St7GetGeometryEdgeRadiationTables	St7GetGeometryCoedgeRadiationTables
St7GetGeometryEdgeRelease1	St7GetGeometryCoedgeRelease1
St7GetGeometryEdgeShear1	St7GetGeometryCoedgeShear1
St7GetGeometryEdgeSupport1F	St7GetGeometryCoedgeSupport4
St7GetGeometryFaceGlobalPressure3	St7GetGeometryFaceGlobalPressure3S
St7GetGeometryFaceNormalPressure1	St7GetGeometryFaceNormalPressure2
St7GetGeometryFaceNSMass5	St7GetGeometryFaceNSMass5ID
St7GetGeometryFaceSupport1F	St7GetGeometryFaceSupport4
St7GetHRAResultType	St7GetHRAMode
St7GetLBAInitialFile	St7GetLBAInitial
St7GetLSACombinationSpectralName	St7GetLSACombinationSRAName
St7GetLSAInitialPCGFile	St7GetInitialPCGFile
St7GetLSAInitialPCGFileState	St7GetInitialPCGFileState
St7GetLTAInitialFile	St7GetLTAInitial
St7GetModalLoadType	St7GetHRALoadType, St7GetSRADirectionVectorType
St7GetModalNodeReactionType	* In R3, both inertia force and element force are available in the result file. See srNodeInertia in API Manual.
St7GetMultiPointLink	St7GetInterpolatedMultiPointLink, St7GetUserDefinedMultiPointLink
St7GetNFAInitialFile	St7GetNFAInitial
St7GetNFANonStructuralMassCaseState	St7GetNSMassCaseInMassMatrixState
St7GetNLAInitialFile	St7GetNLAInitial
St7GetNodeNSMass5	St7GetNodeNSMass5ID
St7GetNTAFreedomPositionTable	St7GetTransientFreedomPositionTable
St7GetNTAInitialFile	St7GetNTAInitial
St7GetNTALoadPositionTable	St7GetTransientLoadPositionTable
St7GetNumSRADirectionVectors	St7GetNumSRABaseCases
St7GetPath	St7GetAPIPath
St7GetPlateEdgeNormalShear1	St7GetPlateEdgeTransverseShear1
St7GetPlateEdgeSupport1F	St7GetPlateEdgeSupport4
St7GetPlateFaceSupport1F	St7GetPlateFaceSupport4
St7GetPlateGlobalPressure3	St7GetPlateGlobalPressure3S
St7GetPlateNormalPressure1	St7GetPlateNormalPressure2

R24 Function	R3 Function to Use/Comment
St7GetPlateNSMass5	St7GetPlateNSMass5ID
St7GetPlatePropertyData	* See “Properties – Beams, Plates and Bricks” in API Manual.
St7GetPlateResultUserEquation	St7GetResultUserEquation
St7GetQSAInitialFile	St7GetQSAInitial
St7GetResFileQuantity	St7GetResFileQuantityState
St7GetResultLimit	* Not available in R3.
St7GetResultSurfaceBricksOnly	* Not available in R3.
St7GetSeismicCaseName	St7GetLoadCaseName
St7GetSeismicNSMassCaseState	* Seismic cases in R3 define their own non-structural mass attributes.
St7GetSelectionToolBarPosition	* Not available in R3.
St7GetSRADirectionVectorFactors	St7GetSRABaseCaseFactors
St7GetSRADirectionVectorTable	St7GetSRABaseCaseTable
St7GetTHAInitialFile	St7GetTHAInitial
St7GetTransientBaseResults	St7GetResultOptions, ipResOptsBaseDisp, ipResOptsBaseVel, ipResOptsBaseAcc
St7GetTransientFreedomTable	St7GetTransientFreedomTimeTable
St7GetTransientLoadTable	St7GetTransientLoadTimeTable
St7GetVertexNSMass5	St7GetVertexNSMass5ID
St7HideSelectionToolBar	St7HideWindowSelectionToolBar
St7HideWindowPopUp	* Not available in R3.
St7HideWindowToolbar	St7HideWindowEntityPanel
St7HideWindowTopPanel	St7HideWindowCombos
St7ImportACISFile	St7ImportACIS
St7ImportANSYSFile	St7ImportANSYS
St7ImportDXFFile	St7ImportDXF
St7ImportIGESFile	St7ImportIGES
St7ImportNASTRANFile	St7ImportNASTRAN
St7ImportSAP2000File	St7ImportSAP2000
St7ImportST6BinaryFile	* Not available in R3.
St7ImportST6TextFile	* Not available in R3.
St7ImportST7File	St7ImportST7
St7ImportSTAADFile	St7ImportSTAAD
St7ImportSTEPFile	St7ImportSTEP
St7ImportSTLFile	St7ImportSTL
St7InsertSRADirectionVector	St7InsertSRABaseCase
St7NewSeismicCase	St7NewLoadCase
St7SaveFileTo	St7SaveFileCopy
St7SetBeamCFG4ID	St7SetBeamPointForceGlobal4ID
St7SetBeamCFL4ID	St7SetBeamPointForcePrincipal4ID
St7SetBeamCMG4ID	St7SetBeamPointMomentGlobal4ID
St7SetBeamCML4ID	St7SetBeamPointMomentPrincipal4ID
St7SetBeamDLG6ID	St7SetBeamDistributedForceGlobal6ID
St7SetBeamDLL6ID	St7SetBeamDistributedForcePrincipal6ID
St7SetBeamDML6ID	St7SetBeamDistributedMomentPrincipal6ID

R24 Function	R3 Function to Use/Comment
St7SetBeamSupport2F	St7SetBeamSupport2
St7SetBeamUseMomCurv	St7SetBeamNonlinearMode
St7SetBeamUsePoisson	St7SetBeamShearModulusMode, smUsePoissonsRatio
St7SetBeamUseShearMod	St7SetBeamShearModulusMode, smUseShearModulus
St7SetBrickNSMass5	St7SetBrickNSMass5ID
St7SetBrickResultUserEquation	St7SetResultUserEquation
St7SetBrickSupport1F	St7SetBrickSupport4
St7SetCleanGeometryData	St7SetCleanGeometryOptions
St7SetCleanMeshData	St7SetCleanMeshOptions
St7SetEntityDisplay	* See “Entity Display” in API Manual.
St7SetFrequencyTable	St7SetFrequencyPeriodTableType
St7SetGeometryEdgeAttachment1	St7SetGeometryCoedgeAttachment1
St7SetGeometryEdgeConvection2	St7SetGeometryCoedgeConvection2
St7SetGeometryEdgeConvectionTables	St7SetGeometryCoedgeConvectionTables
St7SetGeometryEdgeFlux1	St7SetGeometryCoedgeFlux1
St7SetGeometryEdgeFluxTables	St7SetGeometryCoedgeFluxTables
St7SetGeometryEdgeNormalShear1	St7SetGeometryCoedgeTransverseShear1
St7SetGeometryEdgePressure1	St7SetGeometryCoedgePressure1
St7SetGeometryEdgeRadiation2	St7SetGeometryCoedgeRadiation2
St7SetGeometryEdgeRadiationTables	St7SetGeometryCoedgeRadiationTables
St7SetGeometryEdgeRelease1	St7SetGeometryCoedgeRelease1
St7SetGeometryEdgeShear1	St7SetGeometryCoedgeShear1
St7SetGeometryEdgeSupport1F	St7SetGeometryCoedgeSupport4
St7SetGeometryFaceGlobalPressure3	St7SetGeometryFaceGlobalPressure3S
St7SetGeometryFaceNormalPressure1	St7SetGeometryFaceNormalPressure2
St7SetGeometryFaceNSMass5	St7SetGeometryFaceNSMass5ID
St7SetGeometryFaceSupport1F	St7SetGeometryFaceSupport4
St7SetHRAResultType	St7SetHRAMode
St7SetLaminateMatrices	St7SetLaminateData
St7SetLBAInitialFile	St7SetLBAInitial
St7SetLSACombinationSpectralName	St7SetLSACombinationSRAName
St7SetLSAInitialPCGFile	St7SetInitialPCGFile
St7SetLTAInitialFile	St7SetLTAInitial
St7SetModalLoadType	St7SetHRALoadType, St7SetSRADirectionVectorType
St7SetModalNodeReactionType	* In R3, both inertia force and element force are available in the result file. See srNodeInertia in API Manual.
St7SetMultiPointLink	St7SetInterpolatedMultiPointLink, St7SetUserDefinedMultiPointLink
St7SetNFAInitialFile	St7SetNFAInitial
St7SetNLAInitialFile	St7SetNLAInitial
St7SetNodeNSMass5	St7SetNodeNSMass5ID
St7SetNTAFreedomPositionTable	St7SetTransientFreedomPositionTable
St7SetNTAInitialFile	St7SetNTAInitial
St7SetNTALoadPositionTable	St7SetTransientLoadPositionTable
St7SetPlateEdgeNormalShear1	St7SetPlateEdgeTransverseShear1

R24 Function	R3 Function to Use/Comment
St7SetPlateEdgeSupport1F	St7SetPlateEdgeSupport4
St7SetPlateFaceSupport1F	St7SetPlateFaceSupport4
St7SetPlateGlobalPressure3	St7SetPlateGlobalPressure3S
St7SetPlateNormalPressure1	St7SetPlateNormalPressure2
St7SetPlateNSMass5	St7SetPlateNSMass5ID
St7SetPlateResultUserEquation	St7SetResultUserEquation
St7SetQSAInitialFile	St7SetQSAInitial
St7SetResultLimit	* Not available in R3.
St7SetResultSurfaceBricksOnly	* Not available in R3.
St7SetSeismicCaseName	St7SetLoadCaseName
St7SetSelectionToolBarPosition	* Not available in R3.
St7SetSRADirectionVectorFactors	St7SetSRABaseCaseFactors
St7SetSRADirectionVectorTable	St7SetSRABaseCaseTable
St7SetTHAInitialFile	St7SetTHAInitial
St7SetTransientBaseResults	St7SetResultOptions, ipResOptsBaseDisp, ipResOptsBaseVel, ipResOptsBaseAcc
St7SetTransientFreedomTable	St7SetTransientFreedomTimeTable
St7SetTransientLoadTable	St7SetTransientLoadTimeTable
St7SetVertexNSMass5	St7SetVertexNSMass5ID
St7ShowSelectionToolBar	St7ShowWindowSelectionToolbar
St7ShowWindowPopUp	* Not available in R3. See “Model Window” in API manual.
St7ShowWindowToolbar	St7ShowWindowEntityPanel
St7ShowWindowTopPanel	St7ShowWindowCombos
St7ToolAlignBeamAxes	St7AlignBeamAxesToUCS
St7ToolAlignPlateAxes	St7AlignPlateAxesToUCS
St7ToolAttachParts	St7CreateAttachments
St7ToolConvertPatchLoads	St7ConvertPatchLoads
St7ToolPolygonToFace	St7FaceFromBeamPolygon
St7UpdateResultFileComb	St7RetrieveResultFileComb

Appendix 2 – R24 constants not available in R3

The table below lists constants that are not used in the R3 API. Where applicable, alternative constants or functions are provided.

R24 Constant	R3 Related Constant/Function
anUnits_g_cm_C	usANSYS_g_cm_C
anUnits_kg_m_C	usANSYS_kg_m_C
anUnits_lbm_in_F	usANSYS_lbm_in_F
anUnits_NoUnits	usANSYS_None
anUnits_sl_ft_F	usANSYS_sl_ft_F
anUnits_T_mm_C	usANSYS_T_mm_C
AtCentroid	spCentroid
AtGaussPoints	spGaussPoints
AtNodesAverageAll	spNodesAverageAll
AtNodesAverageNever	spNodesAverageNever
AtNodesAverageSame	spNodesAverageSame
ATTRBeamAngle	aoBeamAngle
ATTRBeamCFG	aoBeamCFG
ATTRBeamCFL	aoBeamCFL
ATTRBeamCMG	aoBeamCMG
ATTRBeamCML	aoBeamCML
ATTRBeamConnectionUCS	aoBeamConnectionUCS
ATTRBeamConvection	aoBeamConvection
ATTRBeamCreepLoadingAge	aoBeamCreepLoadingAge
ATTRBeamDLG	aoBeamDLG
ATTRBeamDLL	aoBeamDLL
ATTRBeamDML	aoBeamDML
ATTRBeamEndAttachment	aoBeamEndAttachment
ATTRBeamFlux	aoBeamFlux
ATTRBeamHeatSource	aoBeamHeatSource
ATTRBeamInfluence	aoBeamInfluence
ATTRBeamNSMass	aoBeamNSMass
ATTRBeamOffset	aoBeamOffset
ATTRBeamPreTension	aoBeamPreTension
ATTRBeamRadiation	aoBeamRadiation
ATTRBeamRadius	aoBeamRadius
ATTRBeamREndRelease	aoBeamREndRelease
ATTRBeamSectionFactor	aoBeamSectionFactor
ATTRBeamStageProperty	aoBeamStageProperty
ATTRBeamStringGroup	aoBeamStringGroup
ATTRBeamSupport	aoBeamSupport
ATTRBeamTaper	aoBeamTaper
ATTRBeamTempGradient	aoBeamTempGradient
ATTRBeamTEndRelease	aoBeamTEndRelease
ATTRBrickConvection	aoBrickConvection
ATTRBrickCreepLoadingAge	aoBrickCreepLoadingAge

R24 Constant	R3 Related Constant/Function
ATTRBrickFaceAttachment	aoBrickFaceAttachment
ATTRBrickFaceFoundation	aoBrickFaceFoundation
ATTRBrickFlux	aoBrickFlux
ATTRBrickGlobalPressure	aoBrickGlobalPressure
ATTRBrickHeatSource	aoBrickHeatSource
ATTRBrickInfluence	aoBrickInfluence
ATTRBrickLocalAxes	aoBrickLocalAxes
ATTRBrickNSMass	aoBrickNSMass
ATTRBrickPointForce	aoBrickPointForce
ATTRBrickPreLoad	aoBrickPreLoad
ATTRBrickPressure	aoBrickPressure
ATTRBrickRadiation	aoBrickRadiation
ATTRBrickShear	aoBrickShear
ATTRBrickSoilRatio	aoBrickSoilRatio
ATTRBrickSoilStress	aoBrickSoilStress
ATTRBrickStageProperty	aoBrickStageProperty
ATTRCableFreeLength	aoCableFreeLength
ATTRDamping	aoDamping
ATTRForce	aoForce
ATTRFreedom	aoRestraint
ATTRKRotation	aoKRotation
ATTRKTranslation	aoKTranslation
ATTRLoadPatch	aoLoadPatch
ATTRMoment	aoMoment
ATTRMRotation	aoMRotation
ATTRMTranslation	aoMTranslation
ATTRNodeAcceleration	aoNodeAcceleration
ATTRNodeHeatSource	aoNodeHeatSource
ATTRNodeInfluence	aoNodeInfluence
ATTRNodeVelocity	aoNodeVelocity
ATTRNSMass	aoNSMass
ATTRPipePressure	aoPipePressure
ATTRPipeTemperature	aoPipeTemperature
ATTRPlateAngle	aoPlateAngle
ATTRPlateCreepLoadingAge	aoPlateCreepLoadingAge
ATTRPlateEdgeAttachment	aoPlateEdgeAttachment
ATTRPlateEdgeConvection	aoPlateEdgeConvection
ATTRPlateEdgeNormalShear	aoPlateEdgeTransverseShear
ATTRPlateEdgePressure	aoPlateEdgeNormalPressure
ATTRPlateEdgeRadiation	aoPlateEdgeRadiation
ATTRPlateEdgeRelease	aoPlateEdgeRelease
ATTRPlateEdgeShear	aoPlateEdgeShear
ATTRPlateEdgeSupport	aoPlateEdgeSupport
ATTRPlateFaceAttachment	aoPlateFaceAttachment

R24 Constant	R3 Related Constant/Function
ATTRPlateFaceConvection	aoPlateFaceConvection
ATTRPlateFacePressure	aoPlateFacePressure
ATTRPlateFaceRadiation	aoPlateFaceRadiation
ATTRPlateFaceShear	aoPlateFaceShear
ATTRPlateFaceSupport	aoPlateFaceSupport
ATTRPlateFlux	aoPlateFlux
ATTRPlateGlobalPressure	aoPlateGlobalPressure
ATTRPlateHeatSource	aoPlateHeatSource
ATTRPlateInfluence	aoPlateInfluence
ATTRPlateNSMass	aoPlateNSMass
ATTRPlateOffset	aoPlateOffset
ATTRPlatePointForce	aoPlatePointForce
ATTRPlatePointMoment	aoPlatePointMoment
ATTRPlatePreLoad	aoPlatePreLoad
ATTRPlateSoilRatio	aoPlateSoilRatio
ATTRPlateSoilStress	aoPlateSoilStress
ATTRPlateStageProperty	aoPlateStageProperty
ATTRPlateTempGradient	aoPlateTempGradient
ATTRPlateThickness	aoPlateThickness
ATTRTemperature	aoTemperature
beLocal	* Local and principal results are both available in R3.
bePrincipal	* Local and principal results are both available in R3.
bmLine	ieBeamAsLine
bmSection	ieBeamAsSection
bmSolid	ieBeamAsSolid
cfCreepFunction	crCreepFunction
cfRelaxationFunction	crRelaxationFunction
cmFaceColour	St7SetFaceFill, ffFaceNumber
cmFixedColour	St7SetFaceFill, ffColour
cmGroupColour	St7SetFaceFill, ffGroup
cmLoadPathColour	St7SetPathFill, tfPathNumber
cmLoadPathGlobalColour	St7SetPathFill, tfColour
cmLoadPathGroupColour	St7SetPathFill, tfGroup
cmLoadPathTemplateColour	St7SetPathFill, tfTemplate
cmPropertyColour	St7SetFaceFill, ffProperty
crReoAntiSymmetric	crRCAntiSymmetric
crReoElastoPlasticIter	crRCElastoPlasticIter
crReoSimplified	crRCSimplified
crReoSymmetric	crRCSymmetric
ctBeamSupport1	ctBeamSupportM1, ctBeamSupportP1
ctBeamSupport2	ctBeamSupportM2, ctBeamSupportP2
ctBrickGlobalPressure	ctBrickGlobalPressureMagnitude
ctBrickRaditionCoeff	ctBrickRadiationCoeff
ctBrickSoilRatioEO	ctBrickSoilRatioE0

R24 Constant	R3 Related Constant/Function
ctBrickSoilStressKO	ctBrickSoilStressK0
ctBrickSupport	ctBrickNormalSupport
ctCuringNormal	crCementCuringNormal
ctCuringRapid	crCementCuringRapid
ctCuringSlow	crCementCuringSlow
ctPlateEdgeNormalShear	ctPlateEdgeTransverseShear
ctPlateEdgePressure	ctPlateEdgeNormalPressure
ctPlateEdgeSupport	ctPlateEdgeNormalSupport
ctPlateFaceSupport	ctPlateFaceNormalSupportMinusZ, ctPlateFaceNormalSupportPlusZ
ctPlatePresStressZ	ctPlatePreStressZ
ctPlatePressureGlobal	ctPlateGlobalPressureMinusZ, ctPlateGlobalPressurePlusZ
ctPlatePressureGlobalX	ctPlateGlobalPressureXMinusZ, ctPlateGlobalPressureXPlusZ
ctPlatePressureGlobalY	ctPlateGlobalPressureYMinusZ, ctPlateGlobalPressureYPlusZ
ctPlatePressureGlobalZ	ctPlateGlobalPressureZMinusZ, ctPlateGlobalPressureZPlusZ
ctPlatePressureNormal	ctPlateNormalPressureMinusZ, ctPlateNormalPressurePlusZ
ctPlateSoilRatioEO	ctPlateSoilRatioE0
ctPlateSoilStressKO	ctPlateSoilStressK0
dfGeometryDeleteBoth	dfLeaveNone
dfGeometryDeleteOne	dfLeaveOne
dfGeometryLeave	dfLeaveAll
dmLine	St7SetBeamStyle, bsLine
dmSection	St7SetBeamStyle, bsSection
dmSlice	St7SetBeamStyle, bsSlice
dmSolid	St7SetBeamStyle, bsSolid
dtViscousDamping	dtPropertyDamping
ERR7_APINotLicensed	ERR7_APIModuleNotLicensed
ERR7_CannotFindStubFile	* Not used in R3.
ERR7_InsufficientRamToCreateImage	ERR7_ErrorCreatingImage
ERR7_InvalidMultiPointFactorsType	ERR7_InvalidMultiPointType
ERR7_InvalidPolygonToFaceParameters	ERR7_InvalidFaceFromBeamPolygonParameters
ERR7_InvalidResOptsBeamEnvelope	* Not used in R3.
ERR7_InvalidResOptsHRASetting	* Not used in R3.
ERR7_InvalidResOptsStageDisplacement	* Not used in R3.
ERR7_InvalidZipTolerance	ERR7_InvalidTolerance
ERR7_InvalidZipType	ERR7_InvalidToleranceType
ERR7_NoPatchLoadsCreated	ERR7_OperationFailed
ERR7_NoPolygonWasConverted	ERR7_OperationFailed
ERR7_ResFileInvalidName	ERR7_InvalidName
ERR7_SparseSolverNotLicenced	ERR7_SparseSolverModuleNotLicensed
ERR7_ToolOperationFailed	ERR7_OperationFailed
ERR7_UnknownSolver	ERR7_InvalidSolverType
ERR7_UnknownUCS	ERR7_InvalidUCSID
ERR7_ZeroPlateElements	ERR7_NoPlateElements
esThickEdge	St7SetFaceLineThickness

R24 Constant	R3 Related Constant/Function
esThinEdge	St7SetFaceLineThickness
fmGlobalColour	St7SetBeamFill, St7SetPlateFill, St7SetBrickFill
fmGroupColour	St7SetBeamFill, St7SetPlateFill, St7SetBrickFill
fmGroupWireframe	St7SetBeamFill, St7SetPlateFill, St7SetBrickFill, St7SetBeamOutline, St7SetPlateOutline, St7SetBrickOutline
fmOrientation	St7SetBeamFill, St7SetPlateFill
fmOutlineWireframe	St7SetBeamFill, St7SetPlateFill, St7SetBrickFill, St7SetBeamOutline, St7SetPlateOutline, St7SetBrickOutline
fmPropertyColour	St7SetBeamFill, St7SetPlateFill, St7SetBrickFill
fmPropertyWireframe	St7SetBeamFill, St7SetPlateFill, St7SetBrickFill, St7SetBeamOutline, St7SetPlateOutline, St7SetBrickOutline
grAssembly	ggAssemblies
grAuto	ggAuto
grLevels	ggLevels
grNone	ggNone
grSubfigures	ggSubfigures
hrRelative	* Not used in R3.
hrTotal	* Not used in R3.
htVsFrequency	hmVsFrequency
htVsTime	hmVsTime
icAccC	rqAccC
icBeamCreepStrainC	rqBeamCreepStrainC
icBeamEnergyC	rqBeamEnergyC
icBeamFluxC	rqBeamFluxC
icBeamForceC	rqBeamForceC
icBeamStrainC	rqBeamStrainC
icBeamStressC	rqBeamStressC
icBeamTGradC	rqBeamTGradC
icBrickCreepStrainC	rqBrickCreepStrainC
icBrickEnergyC	rqBrickEnergyC
icBrickFluxC	rqBrickFluxC
icBrickStrainC	rqBrickStrainC
icBrickStressC	rqBrickStressC
icBrickTGradC	rqBrickTGradC
icDispC	rqDispC
icNodeFluxC	rqNodeFluxC
icNodeForceC	rqNodeForceC
icPhaseC	rqPhaseC
icPlateCreepStrainC	rqPlateCreepStrainC
icPlateCurvatureC	rqPlateCurvatureC
icPlateEnergyC	rqPlateEnergyC
icPlateFluxC	rqPlateFluxC
icPlateForceC	rqPlateForceC
icPlateMomentC	rqPlateMomentC
icPlateStrainC	rqPlateStrainC
icPlateStressC	rqPlateStressC

R24 Constant	R3 Related Constant/Function
icPlateTGradC	rqPlateTGradC
icReactC	rqReactC
icTempC	rqTempC
icVelC	rqVelC
ieColourNone	ieGeomColourNone
ieFaceColour	ieGeomFaceColour
ieGroupColour	ieGeomGroupColour
ieModelOnly	ieGeomModelOnly
ieModelPreferred	ieGeomModelPreferred
ieParameterOnly	ieGeomParameterOnly
ieParameterPreferred	ieGeomParameterPreferred
iePropertyColour	ieGeomPropertyColour
ieSeamOnlyAsRequired	ieGeomSeamOnlyAsRequired
ieSplitIntoHalves	ieGeomSplitIntoHalves
ieSplitOnFaceBoundary	ieGeomSplitOnFaceBoundary
ifBoundedSurface	ieIGESBoundedSurface
ifManifoldSolidBRep	ieIGESManifoldSolidBRep
ifOpenShell	ieIGESOpenShell
ifTrimmedParametricSurface	ieIGESTrimmedParametricSurface
ilAttachmentLink	ltAttachmentLink
ilCouplingLink	ltCouplingLink
ilMasterSlaveLink	ltMasterSlaveLink
ilMultiPointLink	ltInterpolatedMultiPointLink, ltUserDefinedMultiPointLink
ilPinnedLink	ltPinnedLink
ilRigidLink	ltRigidLink
ilSectorSymmetryLink	ltSectorSymmetryLink
ilShrinkLink	ltShrinkLink
ilTwoPointLink	ltTwoPointLink
imDisplay	* Not used in R3. See “Model Window” in API Manual.
imResults	* Not used in R3. See “Model Window” in API Manual.
imSelect	* Not used in R3. See “Model Window” in API Manual.
imShow	* Not used in R3. See “Model Window” in API Manual.
imView	* Not used in R3. See “Model Window” in API Manual.
ipAllBrickFaces	St7CreateAttachments
ipAngleDelta	St7CreateAttachments
ipAniParentHandle	St7CreateAnimationEmbedded
ipAvShearStress1	ipShearF1MeanShearStress
ipAvShearStress2	ipShearF2MeanShearStress
ipBeamContour	St7SetEntityContourIndex
ipBeamDisplay	St7SetBeamStyle
ipBeamEnd1Colour	St7SetBeamColours
ipBeamEnd2Colour	St7SetBeamColours
ipBeamFilledMode	St7SetBeamStyle
ipBeamFlux	* See “Beam Results” in API Manual.

R24 Constant	R3 Related Constant/Function
ipBeamGlobalColour	St7SetBeamColours
ipBeamLightShade	St7SetBeamLighting
ipBeamMoveToOffset	St7SetBeamMoveToOffset
ipBeamNumberMode	St7SetBeamLabelStyle
ipBeamOutlineColour	St7SetBeamColours
ipBeamOutlines	St7SetBeamOutline
ipBeamRefNodeColour	St7SetBeamColours
ipBeamRoundFacets	St7SetBeamRoundFacets
ipBeamSections	St7SetBeamSlices
ipBeamShowAxes	St7SetBeamDrawAxes
ipBeamShowOffset	St7SetBeamOffsetNodes
ipBeamShowRefNode	St7SetBeamNRef
ipBeamShrink	St7SetBeamShrink
ipBeamSpringAspect	St7SetBeamSpringAspect
ipBeamSpringCoils	St7SetBeamSpringCoils
ipBeamTempGradient	* See “Beam Results” in API Manual.
ipBeamThickness	St7SetBeamLineThickness
ipBrickAxes1	St7SetBrickDrawAxes
ipBrickAxes2	St7SetBrickDrawAxes
ipBrickAxes3	St7SetBrickDrawAxes
ipBrickCombMean	ipBrickCombDevMean
ipBrickContour	St7SetEntityContourIndex
ipBrickFilledMode	St7SetBrickFill
ipBrickFluxGlobalRMS	ipBrickFluxGlobalMagXYZ
ipBrickFluxGlobalXY	ipBrickFluxGlobalMagXY
ipBrickFluxGlobalYZ	ipBrickFluxGlobalMagYZ
ipBrickFluxGlobalZX	ipBrickFluxGlobalMagZX
ipBrickFluxLocalRMS	ipBrickFluxLocalMagxyz
ipBrickFluxLocalxy	ipBrickFluxLocalMagxy
ipBrickFluxLocalyz	ipBrickFluxLocalMagyz
ipBrickFluxLocalzx	ipBrickFluxLocalMagzx
ipBrickFluxUCSRMS	ipBrickFluxUCSMagXYZ
ipBrickFluxUCSXY	ipBrickFluxUCSMagXY
ipBrickFluxUCSYZ	ipBrickFluxUCSMagYZ
ipBrickFluxUCSZX	ipBrickFluxUCSMagZX
ipBrickGlobalColour	St7SetBrickColours
ipBrickLightShade	St7SetBrickLighting
ipBrickNodeReactFX, pBrickNodeReactFY, ipBrickNodeReactFZ	* See “Brick Results” in API Manual.
ipBrickNumberMode	St7SetBrickLabelStyle
ipBrickOutlineColour	St7SetBrickColours
ipBrickOutlines	St7SetBrickOutline
ipBrickOutlineThickness	St7SetBrickLineThickness
ipBrickShowAllFaces	St7SetBrickWireframeAll
ipBrickShowFreeFaces	St7SetBrickWireframeAll

R24 Constant	R3 Related Constant/Function
ipBrickShrink	St7SetBrickShrink
ipBrickUserAlpha1	ipBrickAnisoAlpha1
ipBrickUserAlpha12	ipBrickAnisoAlpha12
ipBrickUserAlpha2	ipBrickAnisoAlpha2
ipBrickUserAlpha23	ipBrickAnisoAlpha23
ipBrickUserAlpha3	ipBrickAnisoAlpha3
ipBrickUserAlpha31	ipBrickAnisoAlpha31
ipBrickUserConductivity1	ipBrickAnisoConductivity1
ipBrickUserConductivity2	ipBrickAnisoConductivity2
ipBrickUserConductivity3	ipBrickAnisoConductivity3
ipBrickUserDampingRatio	ipBrickAnisoDampingRatio
ipBrickUserDensity	ipBrickAnisoDensity
ipBrickUserSpecificHeat	ipBrickAnisoSpecificHeat
ipBrickUserViscosity	ipBrickAnisoViscosity
ipCableSegments	* Not used in R3.
ipContactStiffness	ipContactAxialStiffness
ipDegree	auDegree
ipDeleteExisting	St7CreateAttachments
ipDoEdges	St7CreateAttachments
ipDoEnds	St7CreateAttachments
ipDoFaces	St7CreateAttachments
ipEdgeColour	St7SetFaceColours, ipFaceLineColour
ipEdgeColourMode	St7SetFaceOutline
ipEdgeNonInterpColour	St7SetFaceColours, ipFaceNIEdgesColour
ipEdgeShow	St7SetFaceOutline
ipEdgeShowNonInterp	St7SetFaceNIEdges
ipEdgeStyle	St7SetFaceLineThickness
ipExportGeomColour	ipGeomExportColour
ipExportGeomCurve	ipGeomExportCurve
ipExportGeomFormatProtocol	ipGeomExportFormatProtocol
ipExportGeomFullGroupPath	ipGeomExportFullGroupPath
ipExportGeomGroupsAsLevels	ipGeomExportGroupsAsLevels
ipExportGeomKeepAnalytic	ipGeomExportKeepAnalytic
ipExportGeomPeriodicFace	ipGeomExportPeriodicFace
ipFaceShowControlPoints	St7SetFaceControlPoints
ipFaceShowNormals	St7SetFaceNormals
ipFaceShowWireframes	St7SetFaceFillStyle
ipFaceWireframeColour	St7SetFaceColours
ipFaceWireframeColourMode	St7SetFaceFillStyle, St7SetFaceFill
ipFaceWireframeDensity	St7SetFaceWireDensity
ipFaceWireframeStyle	St7SetFaceLighting
ipGeometryAccuracy	St7SetToolOptions, ipToolOptsGeometryAccuracy
ipGeometryAccuracyType	St7SetToolOptions, ipToolOptsGeometryAccuracyType
ipGlobAccX	ipLoadCaseAccX

R24 Constant	R3 Related Constant/Function
ipGlobAccY	ipLoadCaseAccY
ipGlobAccZ	ipLoadCaseAccZ
ipGlobAngVelX	ipLoadCaseAngVelX
ipGlobAngVelY	ipLoadCaseAngVelY
ipGlobAngVelZ	ipLoadCaseAngVelZ
ipGlobAngAccX	ipLoadCaseAngAccX
ipGlobAngAccY	ipLoadCaseAngAccY
ipGlobAngAccZ	ipLoadCaseAngAccZ
ipGlobOrigX	ipLoadCaseOrigX
ipGlobOrigY	ipLoadCaseOrigY
ipGlobOrigZ	ipLoadCaseOrigZ
ipImportGeomACISBodiesAsGroups	ipGeomImportGroupsAs
ipImportGeomBlackReplacement	* Not used in R3.
ipImportGeomColourAsProperty	ipGeomImportColourAsProperty
ipImportGeomCurvesToBeams	ipGeomImportCurvesToBeams
ipImportGeomGroupsAs	ipGeomImportGroupsAs
ipImportGeomLengthUnit	ipGeomImportLengthUnit
ipImportGeomProp	ipGeomImportProperty
ipImportGeomTol	ipGeomImportTol
ipLinkAttachmentColour	St7SetLinkColours
ipLinkCouplingColour	St7SetLinkColours
ipLinkFilledMode	St7SetLinkOutline
ipLinkGlobalColour	St7SetLinkColours
ipLinkMasterSlaveColour	St7SetLinkColours
ipLinkMultiPointColour	St7SetLinkColours
ipLinkNumberMode	St7SetLinkLabelStyle
ipLinkPinnedColour	St7SetLinkColours
ipLinkRigidColour	St7SetLinkColours
ipLinkSectorSymmColour	St7SetLinkColours
ipLinkShrinkColour	St7SetLinkColours
ipLinkTwoPointColour	St7SetLinkColours
ipLoadCaseDefAngAccX	ipLoadCaseAngAccX
ipLoadCaseDefAngAccY	ipLoadCaseAngAccY
ipLoadCaseDefAngAccZ	ipLoadCaseAngAccZ
ipLoadCaseDefAngVelX	ipLoadCaseAngVelX
ipLoadCaseDefAngVelY	ipLoadCaseAngVelY
ipLoadCaseDefAngVelZ	ipLoadCaseAngVelZ
ipLoadCaseDefLinAccX	ipLoadCaseAccX
ipLoadCaseDefLinAccY	ipLoadCaseAccY
ipLoadCaseDefLinAccZ	ipLoadCaseAccZ
ipLoadCaseDefOriginX	ipLoadCaseOrigX
ipLoadCaseDefOriginY	ipLoadCaseOrigY
ipLoadCaseDefOriginZ	ipLoadCaseOrigZ
ipLoadCaseDefRefTemp	ipLoadCaseRefTemp

R24 Constant	R3 Related Constant/Function
ipLoadPathColour	St7SetPathColours
ipLoadPathColourMode	St7SetPathFill
ipLoadPathNumberMode	St7SetPathLabelStyle
ipLoadPathShowDivisions	St7SetPathDivisions
ipLoadPathThickness	St7SetPathLineThickness
ipNASTRANLoadCase	ipNASTRANLoadCaseNSMass
ipNodeNumberMode	St7SetNodeLabelStyle
ipNodeResTemp	ipNodeResTempFlux
ipNodeSelectedColour	St7SetNodeColours
ipNodeShowFree	St7SetFreeNodes
ipNodeSymbol	St7SetNodeStyle, St7SetNodeSize
ipNodeUnselectedColour	St7SetNodeColours
ipPlateAxiResFileERT	ipPlateAxiResFileERZ
ipPlateAxiResFileSRT	ipPlateAxiResFileSRZ
ipPlateAxisOnPly	St7SetPlateAxisLayer
ipPlateContour	St7SetEntityContourIndex
ipPlateDisplay	St7SetPlateStyle
ipPlateFilledMode	St7SetPlateFill
ipPlateFluxGlobalSRSS	ipPlateFluxGlobalMagXYZ
ipPlateFluxGlobalXY	ipPlateFluxGlobalMagXY
ipPlateFluxGlobalYZ	ipPlateFluxGlobalMagYZ
ipPlateFluxGlobalZX	ipPlateFluxGlobalMagZX
ipPlateFluxLocalxy	ipPlateFluxLocalMagxy
ipPlateFluxUCSSRSS	ipPlateFluxUCSMagXYZ
ipPlateFluxUCSXY	ipPlateFluxUCSMagXY
ipPlateFluxUCSYZ	ipPlateFluxUCSMagYZ
ipPlateFluxUCSZX	ipPlateFluxUCSMagZX
ipPlateGlobalColour	St7SetPlateColours
ipPlateLightShade	St7SetPlateLighting
ipPlateMoveToOffset	St7SetPlateMoveToOffset
ipPlateNumberMode	St7SetPlateLabelStyle
ipPlateNodeReactFX, ipPlateNodeReactFY, ipPlateNodeReactFZ, ipPlateNodeReactMX, ipPlateNodeReactMY, ipPlateNodeReactMZ	* See “Plate Results” in API Manual.
ipPlateOffset	St7SetPlateOffsetNodes
ipPlateOffsetColour	St7SetPlateColours
ipPlateOutlineColour	St7SetPlateColours
ipPlateOutlines	St7SetPlateOutline
ipPlateOutlineThickness	St7SetPlateLineThickness
ipPlateRCConcreteStrain	ipPlateRCUserConcreteStrain
ipPlateRCSteelStress	ipPlateRCUserSteelStress
ipPlateShellResFileMidPlaneSxx	ipPlateShellResFileSxxMidPlane
ipPlateShellResFileMidPlaneSyy	ipPlateShellResFileSyyMidPlane
ipPlateShellResFileMidPlaneSxy	ipPlateShellResFileSxyMidPlane
ipPlateShellResFileZMinusSxx	ipPlateShellResFileSxxMinusZ

R24 Constant	R3 Related Constant/Function
ipPlateShellResFileZMinusSyy	ipPlateShellResFileSyyMinusZ
ipPlateShellResFileZMinusSxy	ipPlateShellResFileSxyMinusZ
ipPlateShellResFileZPlusSxx	ipPlateShellResFileSxxPlusZ
ipPlateShellResFileZPlusSyy	ipPlateShellResFileSyyPlusZ
ipPlateShellResFileZPlusSxy	ipPlateShellResFileSxyPlusZ
ipPlateShowAxes	St7SetPlateDrawAxes
ipPlateShrink	St7SetPlateShrink
ipPlateZMinusColour	St7SetPlateColours
ipPlateZPlusColour	St7SetPlateColours
ipPolyToFaceDeleteBeams	St7SetSourceAction
ipPolyToFaceEdgeTolerance	St7FaceFromBeamPolygon
ipPolyToFaceFaceID	St7FaceFromBeamPolygon
ipPolyToFaceGroupIndex	St7SetDefaultGroupID
ipPolyToFaceKeepSelected	St7SetKeepSelect
ipPolyToFacePropertyNumber	St7FaceFromBeamPolygon
ipRadian	auRadian
ipRefTemp	ipLoadCaseRefTemp
ipReoAllowCompressionReo	ipRCAllowCompressionReo
ipReoCalcMethod	ipRCCalcMethod
ipReoCode	ipRCCode
ipReoColour13	ipRCColour13
ipReoColour24	ipRCColour24
ipReoConcreteGamma	ipRCConcreteGamma
ipReoConcreteModulus	ipRCConcreteModulus
ipReoConcretePhi	* Replaced with different parameter ipRCConcreteAlpha
ipReoConcreteStrain	ipRCConcreteStrain
ipReoConcreteStress	ipRCConcreteStress
ipReoConsiderMembrane	ipRCConsiderMembrane
ipReoCover1	ipRCCover1
ipReoCover2	ipRCCover2
ipReoDiam1	ipRCDiam1
ipReoDiam2	ipRCDiam2
ipReoDiam3	ipRCDiam3
ipReoDiam4	ipRCDiam4
ipReoLayoutType	ipRCLayoutType
ipReoLimitConcreteStrain	ipRCLimitConcreteStrain
ipReoSpacing1	ipRCSpacing1
ipReoSpacing2	ipRCSpacing2
ipReoSpacing3	ipRCSpacing3
ipReoSpacing4	ipRCSpacing4
ipReoSteelGamma	ipRCSteelGamma
ipReoSteelMinArea	ipRCSteelMinArea
ipReoSteelModulus	ipRCSteelModulus
ipReoSteelStress	ipRCSteelStress

R24 Constant	R3 Related Constant/Function
ipResOptsBeamEnvelope	* Local and principal results are both available in R3.
ipResOptsHRAAcceleration	* Not used in R3.
ipResOptsHRADisplacement	* Not used in R3.
ipResOptsHRAVelocity	* Not used in R3.
ipResOptsStageDisplacement	* Birth/initial displacements are separate result quantities in R3.
ipResultAxis	ipResultSystem
ipSAP2000ConvertBlackTo	* Not used in R3.
ipSeismicCaseDefAlpha	ipSeismicCaseAlpha
ipSeismicCaseDefBeta	ipSeismicCaseBeta
ipSeismicCaseDefDir	ipSeismicCaseDir
ipSeismicCaseDefh0	ipSeismicCaseh0
ipSeismicCaseDefK	ipSeismicCaseK
ipSeismicCaseDefLinAcc	ipSeismicCaseLinAcc
ipSeismicCaseDefPhi	ipSeismicCasePhi
ipSeismicCaseDefV1	ipSeismicCaseV1
ipSeismicCaseDefV2	ipSeismicCaseV2
ipSelectedOnly	St7CreateAttachments
ipSoilCCModulusB	ipSoilCCModulusGb
ipSoilCCModulusG	ipSoilCCModulusGa
ipSoilCCSetLevel	ipSoilCCSetPropLevel
ipSoilDCSetLevel	ipSoilDCSetPropLevel
ipSoilDCUsePoisson	ipSoilDCUseBulkModulus
ipSoilDPSetLevel	ipSoilDPSetPropLevel
ipSoilLSSetLevel	ipSoilLSSetPropLevel
ipSoilMCSetLevel	ipSoilMCSetPropLevel
ipStageMovedFixedNodes	ipStageMoveFixedNodes
ipTetraMeshMultiBodyOption	* Not used in R3.
ipToolOptsAllowSameProperty	* See St7CleanMeshOptions in API Manual.
ipTorqueStress	ipTorqueShearStress
ipTwoPointC0	ipTwoPointConst
ipUseInFirstIteration	* Not used in R3.
ipVertexFixedColour	St7SetVertexColours
ipVertexFreeColour	St7SetVertexColours
ipVertexSelectedColour	St7SetVertexColours
ipVertexSymbol	St7SetVertexStyle, St7SetVertexSize
ipVertextNumberMode	St7SetVertexLabelStyle
ipYieldRatio	ipYieldAreaRatio
kAccelerations	lcAccelerations
kAniAVI	afAniAVI
kAniEXE	afAniEXE
kAniSAF	afAniSAF
kBeamEndRelFixed	brFixed
kBeamEndRelPartial	brPartial
kBeamEndRelReleased	brReleased

R24 Constant	R3 Related Constant/Function
kBeamTypeBeam	btBeam
kBeamTypeCable	btCable
kBeamTypeConnection	btConnection
kBeamTypeContact	btContact
kBeamTypeCutoff	btCutoff
kBeamTypeNull	btNull
kBeamTypePipe	btPipe
kBeamTypeSpring	btSpring
kBeamTypeTruss	btTruss
kBeamTypeUser	btUser
kBrittleGap	cbBrittle
kCircularHollow	bsCircularHollow
kCircularSolid	bsCircularSolid
kCompressionTakeup	tuCompression
kConstantDL	dlConstant
kCruciform	bsCruciform
kDoubleSymmetryInertiaX	fcDoubleSymmetryInertiaX
kDoubleSymmetryInertiaY	fcDoubleSymmetryInertiaY
kDoubleSymmetryInertiaZ	fcDoubleSymmetryInertiaZ
kDuctileGap	cbDuctile
kFreeBodyInertiaRelief	fcFreeBodyInertiaRelief
kGeneralisedMooneyRivlin	rtGeneralisedMooneyRivlin
kGravity	lcGravity
kInstantAlpha	atInstantaneous
kIntegratedAlpha	atIntegrated
kISection	bsISection
kLinearDL	dlLinear
kLipChannel	bsLipChannel
kLSection	bsLSection
kMaterialTypeAnisotropic	mtAnisotropic
kMaterialTypeFluid	mtFluid
kMaterialTypeIsotropic	mtIsotropic
kMaterialTypeLaminate	mtLaminate
kMaterialTypeNull	mtNull
kMaterialTypeOrthotropic	mtOrthotropic
kMaterialTypePly	* Not used in R3.
kMaterialTypeRubber	mtRubber
kMaterialTypeSoil	mtSoil
kMaterialTypeUserDefined	mtUserDefined
kMaxDLPerBeam	* Not used in R3.
kMirrorBot	mtBot
kMirrorLeft	mtLeft
kMirrorLeftAndBot	mtLeftAndBot
kMirrorLeftAndTop	mtLeftAndTop

R24 Constant	R3 Related Constant/Function
kMirrorLeftBotOnly	mtLeftBotOnly
kMirrorLeftTopOnly	mtLeftTopOnly
kMirrorNone	mtNone
kMirrorRight	mtRight
kMirrorRightAndBot	mtRightAndBot
kMirrorRightAndTop	mtRightAndTop
kMirrorRightBotOnly	mtRightBotOnly
kMirrorRightTopOnly	mtRightTopOnly
kMirrorTop	mtTop
kMooneyRivlin	rtMooneyRivlin
kNeoHookean	rtNeoHookean
kNodeAcc	rtNodeAcc
kNodeDisp	rtNodeDisp
kNodeFlux	rtNodeFlux
kNodeInfluence	rtNodeInfluence
kNodePhase	rtNodePhase
kNodeReact	rtNodeReact
kNodeTemp	rtNodeTemp
kNodeVel	rtNodeVel
kNoInertia	lcNoInertia
kNormalContact	ctNormal
kNormalFreedom	fcNormalFreedom
kNullSection	bsNullSection
kOgden	rtOgden
kPlateTypeAxisymmetric	ptAxisymmetric
kPlateTypeLoadPatch	ptLoadPatch
kPlateTypeMembrane	ptMembrane
kPlateTypeNull	ptNull
kPlateTypePlaneStrain	ptPlaneStrain
kPlateTypePlaneStress	ptPlaneStress
kPlateTypePlateShell	ptPlateShell
kPlateTypeShearPanel	ptShearPanel
kSingleSymmetryInertiaXY	fcSingleSymmetryInertiaXY
kSingleSymmetryInertiaYZ	fcSingleSymmetryInertiaYZ
kSingleSymmetryInertiaZX	fcSingleSymmetryInertiaZX
kSquareHollow	bsSquareHollow
kSquareSolid	bsSquareSolid
kTakeupContact	ctTakeup
kTensionContact	ctTension
kTensionTakeup	tuTension
kThreePoint0DL	dlThreePoint0
kThreePoint1DL	dlThreePoint1
kTopHatChannel	bsTopHatChannel
kTrapezoidalDL	dlTrapezoidal

R24 Constant	R3 Related Constant/Function
kTrapezoidHollow	bsTrapezoidHollow
kTrapezoidSolid	bsTrapezoidSolid
kTriangleHollow	bsTriangleHollow
kTriangleSolid	bsTriangleSolid
kTriangularDL	dlTriangular
kTSection	bsTSection
kUserSection	bsBXSSection
kZeroGapContact	ctZeroGap
kZSection	bsZSection
ltSeismicCase	* Seismic cases are represented as load cases in R3.
luGeomCENTIMETRE	luGeomCentimetre
luGeomFEET	luGeomFoot
luGeomINCH	luGeomInch
luGeomKILOMETRE	luGeomKilometre
luGeomMETRE	luGeomMetre
luGeomMICROINCH	luGeomMicroinch
luGeomMICRON	luGeomMicron
luGeomMIL	luGeomMil
luGeomMILES	luGeomMile
luGeomMILLIMETRE	luGeomMillimetre
luGeomNONE	luGeomNone
luGeomUNSPECIFIED	luGeomUnspecified
mbCancelMeshing	* Not used in R3.
mbCavity	* Not used in R3.
mbSeparateSolids	* Not used in R3.
mpInterpolatedFactors	St7SetInterpolatedMultiPointLink, St7GetInterpolatedMultiPointLink
mpUserFactors	St7SetUserDefinedMultiPointLink, St7GetUserDefinedMultiPointLink
mrElementForce	St7SetEntityResult, srNodeReaction
mrInertiaForce	St7SetEntityResult, srNodeInertia
mtAppliedLoad	hlAppliedLoad
mtBaseAcc	slBaseAcc, hlBaseAcc
mtBaseDisp	slBaseDisp, hlBaseDisp
mtBaseVel	slBaseVel, hlBaseVel
naUnits_kg_N_m	usNASTRAN_kg_N_m
naUnits_lbm_lbf_in	usNASTRAN_lbm_lbf_in
naUnits_NoUnits	usNASTRAN_None
naUnits_sl_lbf_ft	usNASTRAN_sl_lbf_ft
naUnits_sl_lbf_in	usNASTRAN_sl_lbf_in
naUnits_T_N_mm	usNASTRAN_T_N_mm
nmByElement	St7SetNodeLabelStyle, St7SetBeamLabelStyle, St7SetPlateLabelStyle, St7SetBrickLabelStyle, St7SetLinkLabelStyle, St7SetVertexLabelStyle, St7SetFaceLabelStyle, St7SetPathLabelStyle, lsEntityNumber
nmByID	St7SetNodeLabelStyle, St7SetBeamLabelStyle, St7SetPlateLabelStyle, St7SetBrickLabelStyle, St7SetLinkLabelStyle, St7SetVertexLabelStyle, St7SetFaceLabelStyle, lsIDNumber
nmByProperty	St7SetBeamLabelStyle, St7SetPlateLabelStyle, St7SetBrickLabelStyle,

R24 Constant	R3 Related Constant/Function
	St7SetFaceLabelStyle, lsPropertyNumber
nmByPropertyName	St7SetBeamLabelStyle, St7SetPlateLabelStyle, St7SetBrickLabelStyle, lsPropertyName
nmNone	St7SetNodeLabelStyle, St7SetBeamLabelStyle, St7SetPlateLabelStyle, St7SetBrickLabelStyle, St7SetLinkLabelStyle, St7SetVertexLabelStyle, St7SetFaceLabelStyle, St7SetPathLabelStyle, lsNone
omOutlineFacet	St7SetPlateOutlineMode, St7SetBrickOutlineMode
omOutlineOff	St7SetBeamOutline, St7SetPlateOutline, St7SetBrickOutline
omOutlineOn	St7SetBeamOutline, St7SetPlateOutline, St7SetBrickOutline
pfNone	ppNone
pfProjComponents	ppProjComponents
pfProjResultant	ppProjResultant
plSolid	iePlateAsSolid
plSurface	iePlateAsSurface
psPlateZMinus	psPlateMinusZ
psPlateZPlus	psPlatePlusZ
ptBeamAxialStressVsStrain	ptBeamStressVsStrain
ptTrussAxialStressVsStrain	ptBeamStressVsStrain
reNodeDisplacement	rvNodeDisplacement
reNodeReaction	rvNodeReaction
rePlateForce	rvPlateForce
rePlateMoment	rvPlateMoment
rgPlaneXY	rlPlaneXY
rgPlaneXYZ	rlPlaneXYZ
rgPlaneYZ	rlPlaneYZ
rgPlaneZX	rlPlaneZX
rtBeamRRelease	St7GetBeamReleaseResult
rtBeamStrain	rtBeamAllStrain
rtBeamStress	rtBeamAllStress
rtBeamTRelease	St7GetBeamReleaseResult
rtBrickEnergy	rtBrickEnergyDensity
rtPlateEnergy	rtPlateEnergyDensity
rtPlateReoDesign	rtPlateRCDesign
sdBirthStage	rtPlateNodeDisp, rtBrickNodeDisp, rtLinkNodeDisp
sdForceUnit_dN	fuSTAADDecanewton
sdForceUnit_kgf	fuSTAADKilogramForce
sdForceUnit_kip	fuSTAADKip
sdForceUnit_kN	fuSTAADKilonewton
sdForceUnit_lbf	fuSTAADPoundForce
sdForceUnit_MN	fuSTAADMeganewton
sdForceUnit_MTf	fuSTAADMegatonneForce
sdForceUnit_N	fuSTAADNewton
sdInitial	rtPlateNodeDisp, rtBrickNodeDisp, rtLinkNodeDisp
sdLengthUnit_cm	luSTAADCentimetre
sdLengthUnit_dm	luSTAADDecimetre

R24 Constant	R3 Related Constant/Function
sdLengthUnit_ft	luSTAADFoot
sdLengthUnit_in	luSTAADInch
sdLengthUnit_km	luSTAADKilometre
sdLengthUnit_m	luSTAADMetre
sdLengthUnit_mm	luSTAADMillimetre
SE_CompositeModuleNotAvailable	SE_CompositesModuleNotLicensed
SE_InvalidSpectralVectors	SE_SpectralCasesNotDefined
SE_SpectralFactorsAllZero	SE_SpectralExcitationsAllZero, SE_SpectralLoadExcitationsAllZero, SE_SpectralBaseExcitationsAllZero
SE_SpectralFactorsNotDefined	SE_SpectralCasesNotDefined
spAutoAssignPathDivisions	* See St7SetMovingLoadAutoDivisions in API Manual.
spAutomotiveDesign	ieSTEPAutomotiveDesign
spConfigControlDesign	ieSTEPConfigControlDesign
spDrillStiffFactor	spDrillStiffFactorQ8, spDrillStiffFactorQ4, spDrillStiffFactorT3
spForceDrillCheck	spForceSingularityCheck
spFrictionCutoffStrain	* Not used in R3.
spLumpedLoadBrick	* Not used in R3.
spMaxNumWarnings	spMaxNumRepeatedMessages
spNumBeamSlicesSpectral	spNumBeamSlicesModal
spSaveModalResults	* Not used in R3.
spSlidingFrictionFactor	* Not used in R3.
spSpectralReactionAsInertia	* In R3, both inertia force and element force are available in the result file. See srNodeInertia in API Manual.
spStickingFrictionFactor	* Not used in R3.
stHarmonicResponseSolver	stHarmonicResponse
stLinearBucklingSolver	stLinearBuckling
stLinearStaticSolver	stLinearStatic
stLinearTransientDynamicSolver	stLinearTransientDynamic
stLoadInfluenceSolver	stLoadInfluence
stNaturalFrequencySolver	stNaturalFrequency
stNonlinearStaticSolver	stNonlinearStatic
stNonlinearTransientDynamicSolver	stNonlinearTransientDynamic
stQuasiStaticSolver	stQuasiStatic
stSpectralResponseSolver	stSpectralResponse
stSteadyHeatSolver	stSteadyHeat
stTransientHeatSolver	stTransientHeat
sy3D1	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
sy3D2	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
sy3D3	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syCircle1	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syCircle2	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syCircle3	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syDisk1	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syDisk2	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syDot1	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle

R24 Constant	R3 Related Constant/Function
syDot2	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syDot3	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
syDot4	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
sySquare1	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
sySquare2	St7SetNodeSize, St7SetNodeStyle, St7SetVertexSize, St7SetVertexStyle
tFixedTemperature	ntFixedTemperature
tInitialTemperature	ntInitialTemperature
TITLEAuthor	tbAuthor
TITLECreated	tbCreated
TITLEModel	tbTitle
TITLEModified	tbModified
TITLEProject	tbProject
TITLEReference	tbReference
tReferenceTemperature	ntReferenceTemperature
tTableTemperature	ntTableTemperature
tyFrequency	ftFrequency
tyPeriod	ftPeriod
UCSCartesian	csCartesian
UCSCylindrical	csCylindrical
UCSSpherical	csSpherical
UCSToroidal	csToroidal
vtVectorComponent	vtVectorTranslationComponents, vtVectorRotationComponents
wsConstantColour	St7SetFaceLighting
wsDepthShaded	St7SetFaceLighting

Appendix 3 – Functions with different signature

The table below lists R3 functions that have a different parameter list compared with the R24 versions. These functions will generate compile time errors, and therefore are relatively easy to find and replace with the aid of the compiler.

Function Name	Change Description
St7CalculateBeamSectionProperties	ExactJ argument removed
St7DeleteResultFileCombCase	Pos argument added
St7GenerateHRATimeHistory	WarningCode argument added
St7GenerateLSACombinations	WarningCode argument added
St7GetBeamNonlinearType	YieldType argument added
St7GetBrickSoilRatio2	CaseNum argument removed
St7GetBrickSoilStress2	CaseNum argument removed
St7GetCableData	Modified Integers array, Doubles array added
St7GetElementData	ResultCase argument added
St7GetElementPropertySequence	Stages array removed
St7GetLibraryID	uID argument removed
St7GetLibraryItemID	uID argument removed
St7GetLibraryItemName	uID argument removed
St7GetLibraryName	uID argument removed
St7GetNumLibraries	uID argument removed
St7GetNumLibraryItems	uID argument removed
St7GetPlateResultMaxJunctionAngle	State argument added
St7GetPlateSoilRatio2	CaseNum argument removed
St7GetPlateSoilStress2	CaseNum argument removed
St7GetTransientBaseTables	BaseType argument added
St7GetTransientNodeHistoryCaseData	NodeNum argument added
St7OpenResultFile	Combinations argument changed
St7PlayAnimationFile	pHandle argument removed, aHandle argument changed
St7SetBeamNonlinearType	YieldType argument added
St7SetBrickSoilRatio2	CaseNum argument removed
St7SetBrickSoilStress2	CaseNum argument removed
St7SetCableData	Modified Integers array, Doubles array added
St7SetPlateResultMaxJunctionAngle	State argument added
St7SetPlateSoilRatio2	CaseNum argument removed
St7SetPlateSoilStress2	CaseNum argument removed
St7SetTransientBaseTables	BaseType argument added
St7SetTransientNodeHistoryCaseData	NodeNum argument added

Appendix 4 – Functions with changed parameter sizes

The table below lists R3 functions that have the same parameter list as the R24 functions, but one or more of the parameters have changed in size or type (typically an array length has increased in size). Careful attention must be paid to these functions because if the size of the variable passed to the function is smaller than what the API expects, a memory access violation or unpredictable behaviour is likely to occur.

Function Name	Change Description
St7AddStage	Modified Integers array
St7CloseAnimation	aHandle argument changed
St7CreateAnimation	Modified Integers array, aHandle argument changed
St7CreateAnimationFile	Modified Integers array
St7DeleteAttribute	Modified Integers array
St7GenerateBXS	Modified Doubles array
St7GetBeamPropertyData	Modified Integers array and BeamMaterial array
St7GetBeamSectionCircularDiscretisation	Modified Integers array
St7GetBrickSoilCCMaterial	Modified Doubles array
St7GetBrickSoilDCMaterial	Modified Integers array and Doubles array
St7GetBrickSoilDPMaterial	Modified Integers array and Doubles array
St7GetBrickSoilLSMaterial	Modified Integers array and Doubles array
St7GetBrickSoilMCMaterial	Modified Integers array and Doubles array
St7GetLaminateMatrices	Modified Integers array
St7GetLoadPath	Modified Integers array
St7GetLoadPathTemplateParameters	Modified Integers array
St7GetModalResultsNFA	Modified ModalRes array
St7GetModelWindowHandle	Handle represented using HWND type
St7GetNodeResponse	ResponseType argument is input, not output
St7GetPlateEdgeAttachment1	Direction argument is input, not output
St7GetPlateResponse	ResponseType argument is input, not output
St7GetPlateSoilCCMaterial	Modified Doubles array
St7GetPlateSoilDCMaterial	Modified Integers array and Doubles array
St7GetPlateSoilDPMaterial	Modified Integers array and Doubles array
St7GetPlateSoilLSMaterial	Modified Integers array and Doubles array
St7GetPlateSoilMCMaterial	Modified Integers array and Doubles array
St7GetPointContactData	Modified Integers array and Doubles array
St7GetReinforcementData	Modified Integers array and Doubles array
St7GetResultOptions	Modified Integers array
St7GetSeismicCaseDefaults	Modified Defaults array
St7GetShrinkLink	Modified Integers array
St7GetStageData	Modified Integers array
St7GetToolOptions	Modified Integers array
St7GetTwoPointLink	Modified Integers array and Doubles array
St7InsertStage	Modified Integers array
St7InsertTransientNodeHistoryCase	Changed order of arguments
St7SetBeamResultDisplay	Modified Integers array
St7SetBeamSectionCircularDiscretisation	Modified Integers array
St7SetBrickResultDisplay	Modified Integers array

Function Name	Change Description
St7SetBrickSoilCCMaterial	Modified Doubles array
St7SetBrickSoilDCMaterial	Modified Integers array and Doubles array
St7SetBrickSoilDPMaterial	Modified Integers array and Doubles array
St7SetBrickSoilLSMaterial	Modified Integers array and Doubles array
St7SetBrickSoilMCMaterial	Modified Integers array and Doubles array
St7SetCopyFlags	Modified Flags array
St7SetLoadPath	Modified Integers array
St7SetLoadPathTemplateParameters	Modified Integers array
St7SetModelWindowParent	Handle represented using HWND type
St7SetPlateResultDisplay	Modified Integers array
St7SetPlateSoilCCMaterial	Modified Doubles array
St7SetPlateSoilDCMaterial	Modified Integers array and Doubles array
St7SetPlateSoilDPMaterial	Modified Integers array and Doubles array
St7SetPlateSoilLSMaterial	Modified Integers array and Doubles array
St7SetPlateSoilMCMaterial	Modified Integers array and Doubles array
St7SetPointContactData	Modified Integers array and Doubles array
St7SetReinforcementData	Modified Integers array and Doubles array
St7SetResultOptions	Modified Integers array
St7SetSeismicCaseDefaults	Modified Defaults array
St7SetShrinkLink	Modified Integers array
St7SetStageData	Modified Integers array
St7SetToolOptions	Modified Integers array
St7SetTwoPointLink	Modified Integers array and Doubles array
St7SolidTetMesh	Modified Integers array
St7SurfaceMesh	Modified Integers array

Appendix 5 - Modified constants

The table below lists constants where the value of the constant has changed but the constant name has stayed the same. If your program code uses the published constants and does not use hard coded values, the values will be updated for you when your program is recompiled. If your program code contains hard coded values in place of the constants, you will need to manually identify and update the code wherever the hard coded values have been used.

Constant Name
adMinusZ
adPlusZ
ctBeamAgeAtFirstLoading
ctBeamConvectionAmbient
ctBeamConvectionCoeff
ctBeamHeatFlux
ctBeamHeatSource
ctBeamPipePressureIn
ctBeamPipePressureOut
ctBeamPipeTempIn
ctBeamPipeTempOut
ctBeamPreStrain
ctBeamPreTension
ctBeamRadiationAmbient
ctBeamRadiationCoeff
ctBeamTemperature
ctBeamTempGradient1
ctBeamTempGradient2
ctBrickAgeAtFirstLoading
ctBrickConvectionAmbient
ctBrickConvectionCoeff
ctBrickDeterminant
ctBrickDihedral
ctBrickDynamicFactor
ctBrickGlobalPressureX
ctBrickGlobalPressureY
ctBrickGlobalPressureZ
ctBrickHeatFlux
ctBrickHeatSource
ctBrickInternalAngle
ctBrickMixedProduct
ctBrickNormalPressure
ctBrickNSMass
ctBrickPreStrainMagnitude
ctBrickPreStrainX
ctBrickPreStrainY
ctBrickPreStrainZ
ctBrickPreStressMagnitude

Constant Name
ctBrickPreStressX
ctBrickPreStressY
ctBrickPreStressZ
ctBrickRadiationAmbient
ctBrickShearMagnitude
ctBrickShearX
ctBrickShearY
ctBrickSoilRatioOCR
ctBrickSoilStressSH
ctBrickSoilStressSV
ctBrickTemperature
ctBrickVolume
ctPlateAgeAtFirstLoading
ctPlateArea
ctPlateAxis1
ctPlateAxis2
ctPlateAxis3
ctPlateContinuousThicknessB
ctPlateContinuousThicknessM
ctPlateConvectionAmbient
ctPlateConvectionAmbientZMinus
ctPlateConvectionAmbientZPlus
ctPlateConvectionCoeff
ctPlateConvectionCoeffZMinus
ctPlateConvectionCoeffZPlus
ctPlateDiscreteThicknessB
ctPlateDiscreteThicknessM
ctPlateDynamicFactor
ctPlateEdgeShear
ctPlateFaceShearMagnitude
ctPlateFaceShearX
ctPlateFaceShearY
ctPlateHeatFlux
ctPlateHeatSource
ctPlateNSMass
ctPlateOffset
ctPlatePreStrainMagnitude
ctPlatePreStrainX
ctPlatePreStrainY
ctPlatePreStrainZ
ctPlatePreStressMagnitude
ctPlatePreStressX
ctPlatePreStressY
ctPlateRadiationAmbient

Constant Name
ctPlateRadiationAmbientZMinus
ctPlateRadiationAmbientZPlus
ctPlateRadiationCoeff
ctPlateRadiationCoeffZMinus
ctPlateRadiationCoeffZPlus
ctPlateSoilRatioOCR
ctPlateSoilStressSH
ctPlateSoilStressSV
ctPlateTemperature
ctPlateTempGradient
ERR7_InvalidToleranceType
etCombEnvelopeMax
etCombEnvelopeMin
etFactEnvelopeMax
etFactEnvelopeMin
etLimitEnvelopeAbs
etLimitEnvelopeMax
etLimitEnvelopeMin
icAppliedVectors
icFromFile
icNodalVelocity
ipAniCase
ipAniHeight
ipAniType
ipAniWidth
ipBeamPropCompatibleTwist
ipBeamPropMirrorType
ipBeamPropSectionType
ipContactSubType
ipFrictionModel
ipFrictionYieldType
ipGeometryActOnWholeModel
ipGeometryDuplicateFaces
ipGeometryEdgeMergeAngle
ipGeometryFeatureLength
ipGeometryFeatureType
ipGeometryFreeEdgesOnly
ipNumFrames
ipPlateAxiCombCreepEffRate
ipPlateAxiResFileETT
ipPlateAxiResFileEZZ
ipPlateAxiResFileSTT
ipPlateAxiResFileSZZ
ipPlateRCBlockRatio

Constant Name
ipPlateRCSteelAreaLessBase
ipRelEnd2Dir1
ipRelEnd2Dir2
ipRelEnd2Dir3
ipResOptsRotationUnit
ipResOptsStrainUnit
ipSAP2000DecimalSeparator
ipSAP2000MergeDuplicateFreedomSets
ipSAP2000ThousandSeparator
ipSoilDCConductivity
ipSoilDCFluidLevel
ipSoilDCSpecificHeat
ipSoilDPCohesion
ipSoilDPFrictionAngle
ipSoilMCCohesion
ipSoilMCFrictionAngle
ipSTAADForceUnit
ipSTAADLengthUnit
ipTensionLateralStiffness
ipToolOptsAutoCreateProperties
ipToolOptsCompatibleTriangle
ipToolOptsCopyMode
ipToolOptsPlateAxisAlign
ipTwoPointC1
ipTwoPointC2
ipUpdateDirection
kNumMaterialData