EUREKA D-SOFT PVT. LTD.

DSTEEL

DSTEEL is a software used to automate the connection design work in steel structures as per the Indian code and other international codes.

INDIAN CODES :

IS-800 – 2007 and other related codes .

BRITISH CODES : (the latest versions of BS – 5950)

BS EN 1993-1-1:2005 : Eurocode 3. Design of steel structures. General rules and rules for buildings.
BS EN 1993-1-5:2006 : Eurocode 3. Design of steel structures. Plated structural elements.
BS EN 1993-1-8:2005 : Eurocode 3. Design of steel structures. Design of joints.

WHAT IS DSTEEL ?

DSTEEL is a software for designing connections in the structural steel works. With the involvement of the engineer, the software helps in getting an economical and practical design. This software covers all the industry requirements. It is based on codes. Various provisions of codes are available for reference as the context's sensitive help and reference clauses are mentioned in the reports . The project specifications can also be used to control the design requirements. This software does the automation of all the manual work involved in the design process. The results from the repeat trials by varying the parameters can be compared. Tailor made solutions can be supplied for a specific project. It is user-friendly and the non-fulfilment of code requirements or mismatches are immediately reflected in RED and the area which needs revision of input is highlighted.

The change and Revision are a part of the life of every project. In Steel Construction, this being not an exception, amounts to revisions in connection details. The design of connections between various elements of a structure is Complex at times. DSTEEL is developed with the aim of providing an easy and a generalized method of designing connections as per the standard codes and specifications. While designing a particular connection, a 3-dimensional view is created which can be rotated and the actual scenario can be visualized. The input is provided under various categories, which immediately reflects in the 3D and the corresponding 2D views to reflect the changes. A good knowledge of structural design helps to use the software effectively. However, a less familiar user can also use and understand from the various messages and warnings displayed by the software.

The software is completely parametric. This helps to accommodate the revisions and see the results instantaneously.

THE SALIENT FEATURES ARE AS FOLLOWS :

- The analysis and design of the structure is supposed to be ready and frozen
- The connections may be designed as per the requirement of the project :
  - For the capacity of the member,
  - For the given loads as per the analysis,
  - For a certain percentage of the capacity of the member
- Connections are designed as per Indian and International codes.
- All required codal requirements are checked and are reported.
- It includes an extensive library of various types of connections under each category like shear connections, moment connections, splices, bracing connections, base plates, welding for fabricated sections etc. and also all bolted, all welded and combination of bolted and welded; giving user a large choice for selection.
- Any specific requirements can be added as per requirements of the project.

MAKING ENGINEERING GRAPHICS

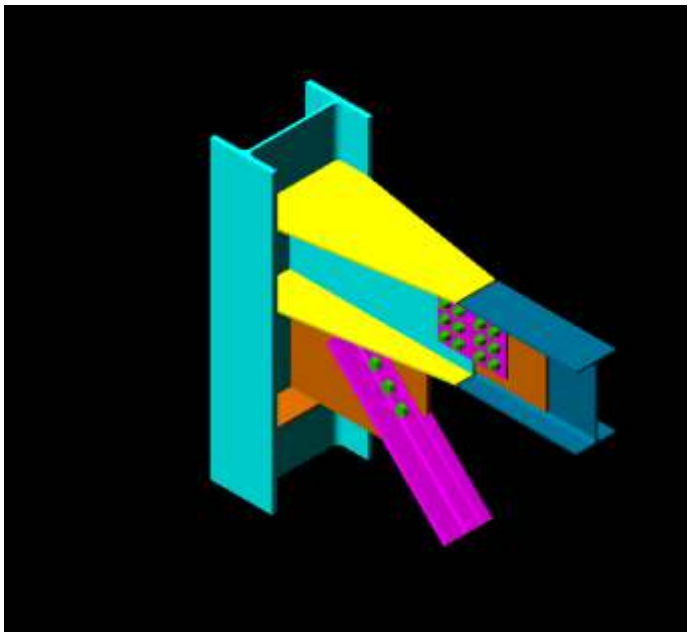
Graphics is actually an engineer's language. What cannot be described by words and paragraphs can be well illustrated by drawing a suitable sketch. A software for this makes the engineers life easy and comfortable for his / her own understanding. It also gives an immediate grasp on the subject and minute details can be clarified. Different alternates can be tried in the same graphics to understand different ideas. Representing the parameters used in making the graphics, further simplifies the matter. When a change in the value of a parameter occurs is immediately reflected in the graphics, This is a real life situation giving a clear idea as the how the things will look and how they will can be located with respect to other objects.

In this software , everything is drawn to scale of 1:1 and with all the above advantages, it is the construction of the project on paper first, then check, review, and accept what is required.

Further to this, it can be revised at any stage, should any revisions occur in the real life project.

WHY DSTEEL ?

Due to revisions in designs for whatever reasons, the loading data and member profiles may change resulting in revisions in the connection design. This can be easily accommodated with the help of this software.



The software also provides the 2D and 3D views of the selected connection which helps the user further to visualize advance details of that connection.

The various views are Dynamically linked. This means, any particular input provided reflects immediately in the alongside sketch giving user a clear concept of what is being done, how the connection will actually look, if any clearance problems or clashing problems are occurring etc.

The material requirements of bolts, plates, welds etc. can be obtained along with the connection design details. Also the capacity of the connection is reflected.

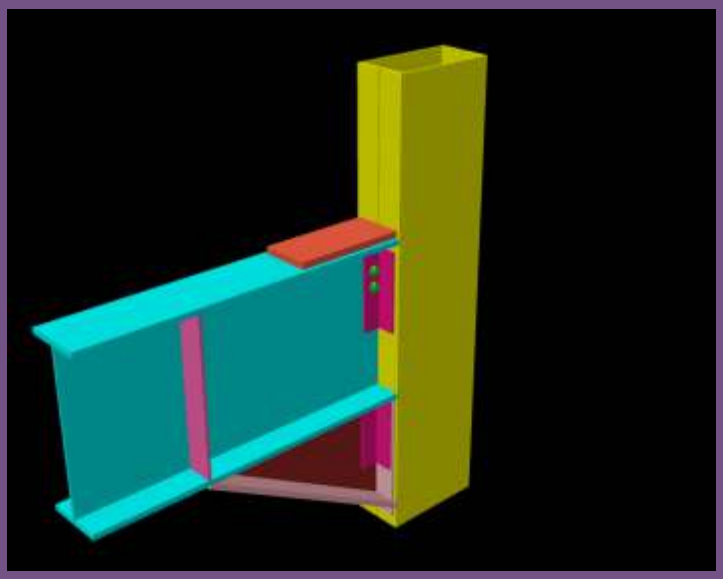
The software produces a complete report of calculations with the 2D and 3D sketches.

For a particular project the complete documentation of all connection reports with the index and required nos. and quantities can be obtained as a final output.

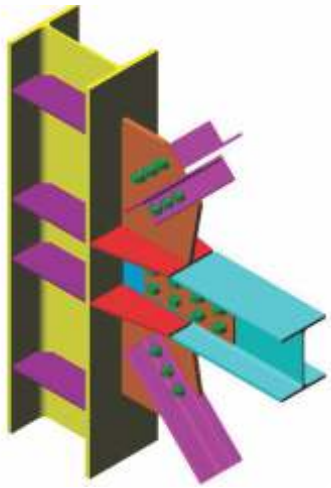
A tabular form can be produced for similar types of connections with various parameter values tabulated along with necessary sketches. An A3 size drawing can be produced with required additional details like the name plate, notes, revision marks etc.

DSTEEL – CONNECTION DESIGN SPECIFIC TO INDUSTRY :

- Pre Engineered Building (PEB)
- Fired Heaters Projects
- Transmission Tower
- Pipe Racks
- Technological Structures
- Building
- Trusses
- Crain Girders
- Equipment supporting Structures
- Space Structures
- Power Plants
- Bridges



CONNECTION DESIGN:



Design:

1. As per IS 800, DIN, BS, AISC, Eurocode; Limit state / Working state method as required.
2. Friction & slip critical as required.
3. Based on forces as specified or full or partial capacity of members.
4. Database or section properties from various code, and other standard data is available during input.
5. Where required user can override the values.
6. Necessary warnings & non-compliance with code are displayed.

Method of Design :

1. As per various clauses of IS - 800
2. Data of various table from IS - 800, section properties as per IS - 808, and other codes are applicable is used as Database and is available during Input.
3. Where required, user can supersede the values.
4. Necessary warnings are displayed.

Types :

Bolted, welded and combination of bolted & welded.

DSTEEL – PLATE OPTIMIZATION :

This application provides an optimum plate cutting layout w.r.t. plate available in market. The cutting plate can be imported in terms of excel or CIS2 stp files.

INPUT

- Excel sheet (having details of main plate and cut plate)
- CIS2 files (having extension .stp)

OUTPUT

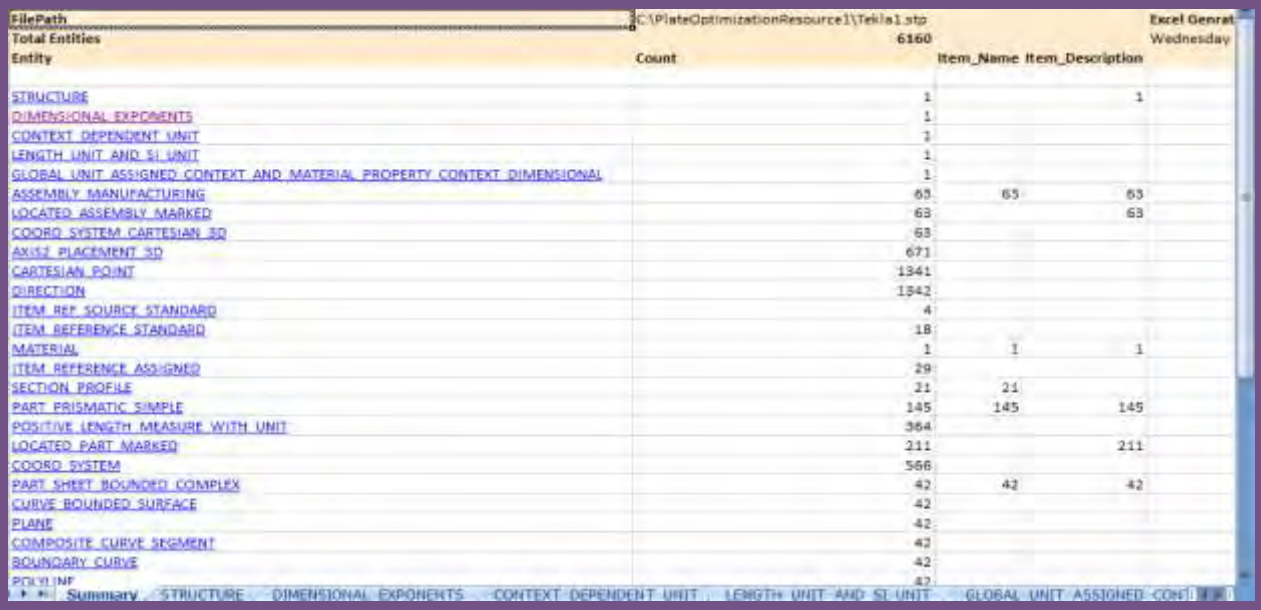
- Graphical View (actual representation of plates in 2D)
- PDF Report (contains details of consumed and remaining plates)

DSTEEL – CIS 2 REPORTING :

This application reads the file with extension .stp i.e. CIS2 file and classifies its contents into tabular view.

Features :

- Export to excel
- Report generation as per the requirement.
  - This can generate reports like PART LIST, ASSEMBLY LIST, BOLT LIST, MATERIAL LIST etc.



FilePath	C:\PlateOptimizationResource1\Tekla1.stp			Excel Genrat
Total Entities	6160			Wednesday
Entity	Count	Item_Name	Item_Description	
STRUCTURE	1		1	
DIMENSIONAL_EXPONENTS	1			
CONTEXT_DEPENDENT_UNIT	1			
LENGTH_UNIT_AND_SI_UNIT	1			
GLOBAL_UNIT_ASSIGNED_CONTEXT_AND_MATERIAL_PROPERTY_CONTEXT_DIMENSIONAL	1			
ASSEMBLY_MANUFACTURING	65	65	65	
LOCATED_ASSEMBLY_MARKED	63		63	
COORD_SYSTEM_CARTESIAN_3D	63			
AXIS2_PLACEMENT_3D	671			
CARTESIAN_POINT	1341			
DIRECTION	1342			
ITEM_REF_SOURCE_STANDARD	4			
ITEM_REFERENCE_STANDARD	18			
MATERIAL	1	1	1	
ITEM_REFERENCE_ASSIGNED	29			
SECTION_PROFILE	21	21		
PART_PRISMATIC_SIMPLE	145	145	145	
POSITIVE_LENGTH_MEASURE_WITH_UNIT	364			
LOCATED_PART_MARKED	211		211	
COORD_SYSTEM	566			
PART_SHEET_BOUNDED_COMPLEX	42	42	42	
CURVE_BOUNDED_SURFACE	42			
PLANE	42			
COMPOSITE_CURVE_SEGMENT	42			
BOUNDARY_CURVE	42			
POLYLINE	42			

Summary | STRUCTURE | DIMENSIONAL_EXPONENTS | CONTEXT_DEPENDENT_UNIT | LENGTH_UNIT_AND_SI_UNIT | GLOBAL_UNIT_ASSIGNED_CONT

TECHNICAL ARTICLE ON CONNECTION DESIGN :

The connections in Steel structures form a very important part in the design and construction work. In real life, several modifications, revisions and changes take place due to revisions in loading, geometry, unavailability of certain profiles etc. This calls for quick revisions in connections as well. Doing the same things again manually certainly consumes lot of time.

A software like DSTEEL helps here. It includes most of the types of common connections, both welded and bolted types. It identifies the basic inputs required for these and gives the detailed calculations along with various views of the connection type.

The most helpful part of this software is the parametric 3D views that gives a very clear picture of the connection details. Any change in the input immediately reflects in the 3D view. It also shows the 2D sketches of various views along with the options of the brief and detailed calculations. These are available in form of report files. The various revisions can be saved. Also a tabular form can be generated for similar types of connections with values of various parameters tabulated, with necessary notes etc. This helps to maintain well documented records for reference and submissions as well.

This software also includes some special connections like Stack splice, Stack stool, and Welding for fabricated sections.

Some salient features of Dsteel :

- A comprehensive database of structural profiles as per various country codes.
- Standard data from codes is built in the software.
- Project wise specifications can be built in, if required.
- Connections can be designed for the given loads, full / partial capacity of the member.
- Permissible stresses, end distances, pitch distances, bolt hole diameters etc are available as default values as per standards and also can be overridden by the user.
- Where requirements of the codes are not fulfilled, a message appears advising the user to take necessary action.
- The report is available for viewing as well as can be saved.
- Requirements and checks which are not met as per code, appear in **RED**, those which are met appear in **GREEN**.

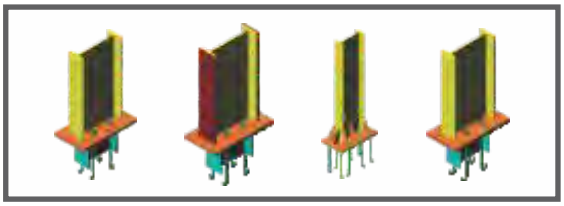
The various images shown here illustrate the variety of connections covered in Dsteel.

The plate data can be utilized for plate cutting optimization. The input required is thickness wise plate sizes available for cutting, the cut sizes and their numbers required. The calculations for a number of plates cut and the remaining plates is obtained as the output along with sketches.

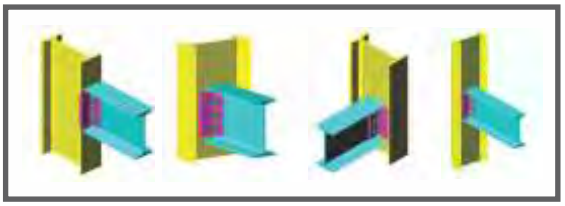
Any specific requirement can be added as per requirements.

CONNECTION DESIGN :

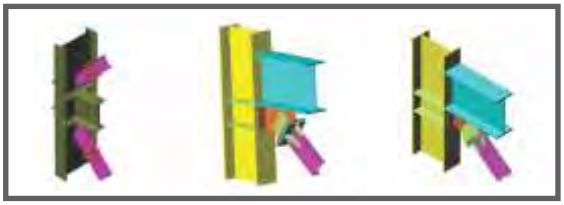
BASE PLATE CONNECTIONS



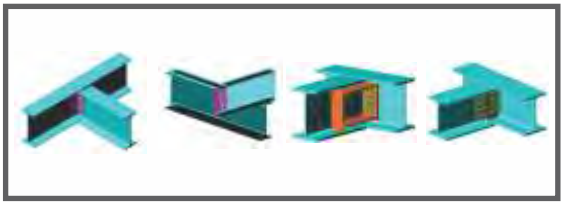
SHEAR CONNECTION – BEAM TO COLUMN



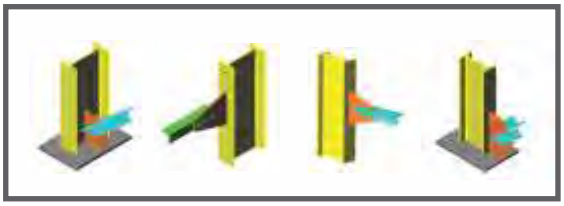
BRACING CONNECTION – I SECTION BRACIN



SHEAR CONNECTION – BEAM TO BEAM



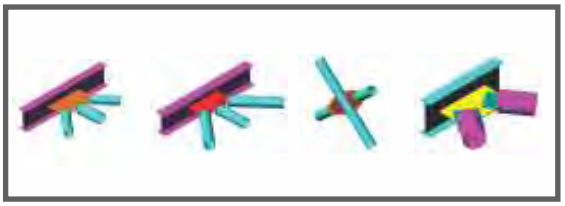
BRACING CONNECTION – ANGLE BRACING



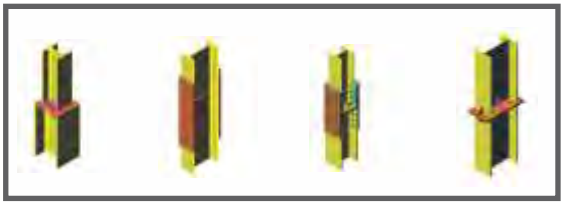
BRACING CONNECTION – CHANNEL BRACING

MOMENT CONNECTION

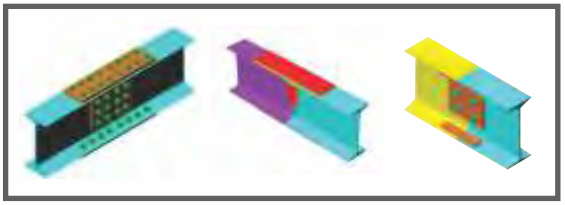
BRACING CONNECTION – PIPE BRACING



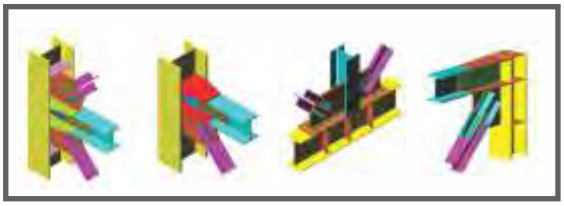
SPLICE CONNECTION - COLUMN



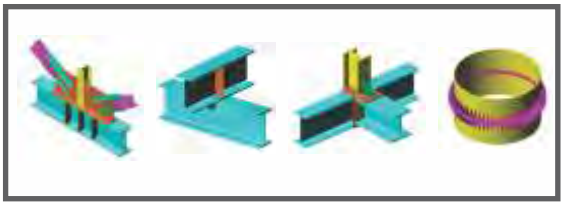
SPLICE CONNECTION - BEAM



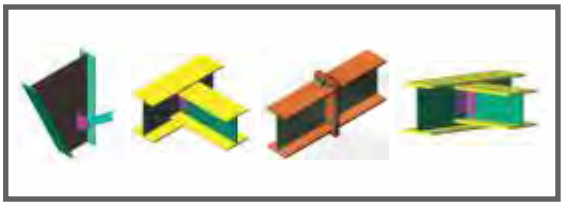
SPECIAL CONNECTION



SPECIAL CONNECTION -1



PEB CONNECTION



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