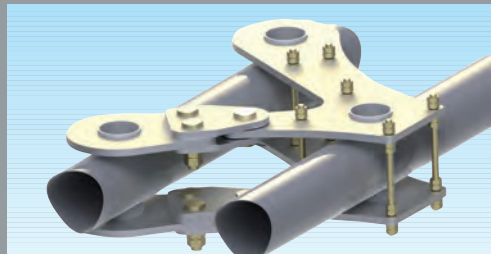
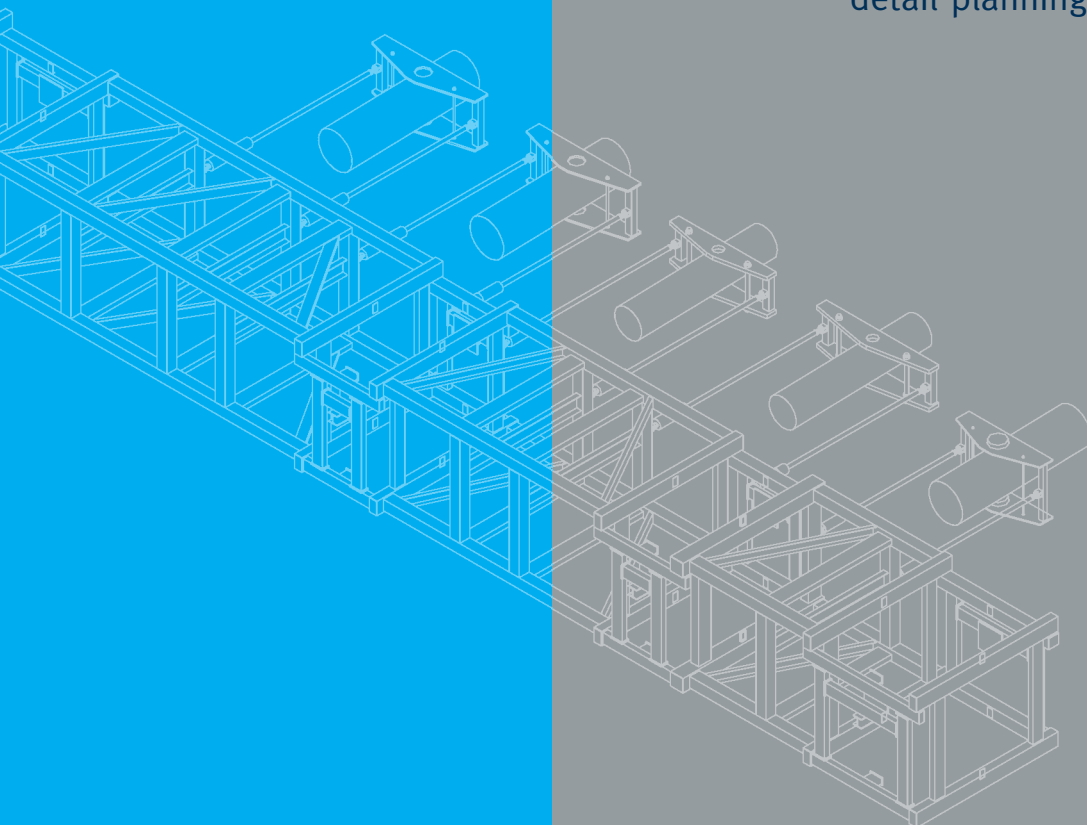


Engineering – Service



Support design for pipe supports and secondary steelwork

Assistance in preliminary design
detail planning and as-built documentation



Support design

LICAD^{Plus}

BENTLEY

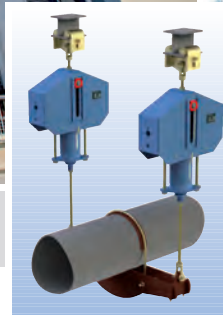
AVEVA

BENTLEY
MicroStation

SIGMA
Ingenieurgesellschaft mbH

INTERGRAPH

AutoCAD



Needed first – designed last

As a rule the project planning of complex pipe systems runs through numerous phases of optimization. The design of pipe supports inevitably takes place at the end of the whole process and so their deployment frequently comes far too late.

Although the supports are needed on site beforehand for optimum installation of the pipe systems, they lie right at the end of the planning chain – all the more important to avoid unnecessary delay. The time factor is now crucial.

stress engineers involved in the process have an enormous effect on the quality of the outcome.

Support design

The proper design and selection of pipe supports has a decisive influence on the long-term behaviour of the piping systems within a plant. The choice of pipe support manufacturer, the availability of modern design software, and the wide-ranging experience level of the structural, piping and

Quality, economy and compliance with deadlines

The deliverables required of pipe support designers are high quality, meeting tight deadlines and minimizing project costs through efficient processes and product designs. With today's plant constructors often lacking the resources necessary to undertake this scope they often outsource the pipe support design work to suitable engineering offices that are not always familiar with the requirements.

Your advantages:

- highest level of safety through professional execution by experienced specialists
- speedy and competent processing of an entire project
- development and design of special requirements
- complete documentation according to all types of specifications
- availability of qualified experts for any after-sales service necessary
- maximize use of your internal resources while using our in-house expertise whenever logic dictates



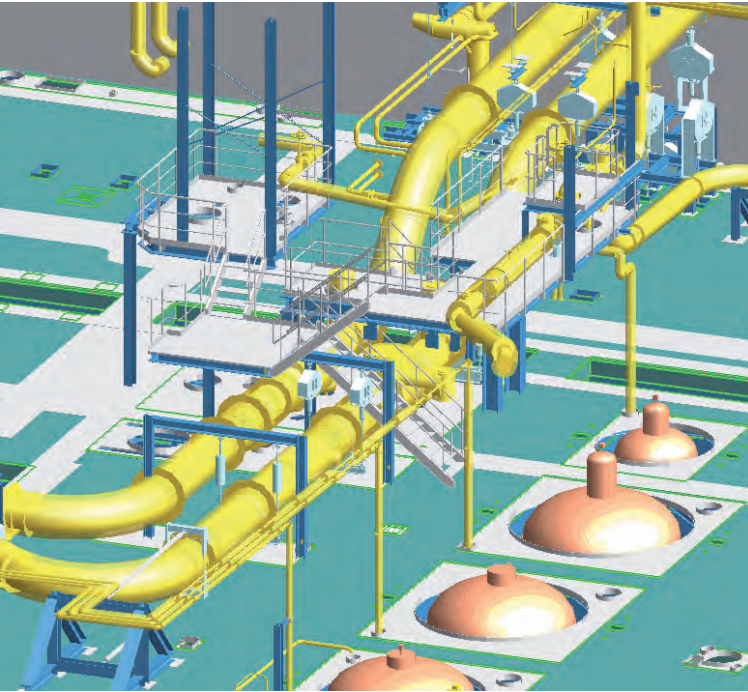
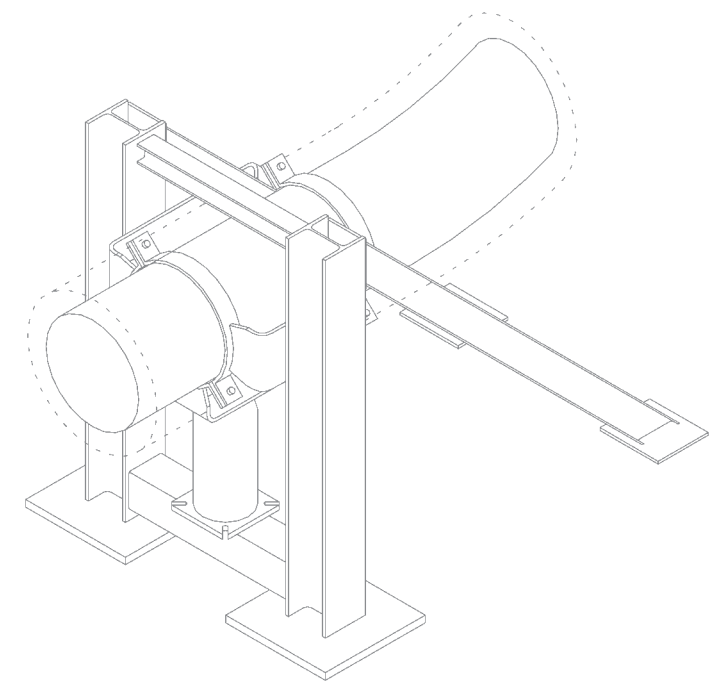
Support design with LISEGA

After analyzing and identifying the support requirements of the worldwide market, years ago LISEGA chose to develop its own technical designs in lieu of imitating competitors. Now, with over 50 years of experience, LISEGA has become the undisputed market leader in the design and manufacture of pipe supports.

Our worldwide offices are filled with highly qualified and experienced support designers. As such, LISEGA is in the unique position of being able to develop complete support assemblies, from struc-

tural attachment to the pipe attachment all from our inventory of over 12,000 standard designs, meeting or exceeding the technical codes and specifications of the project.

Additionally, qualified special products are designed on a regular basis by our own design departments.

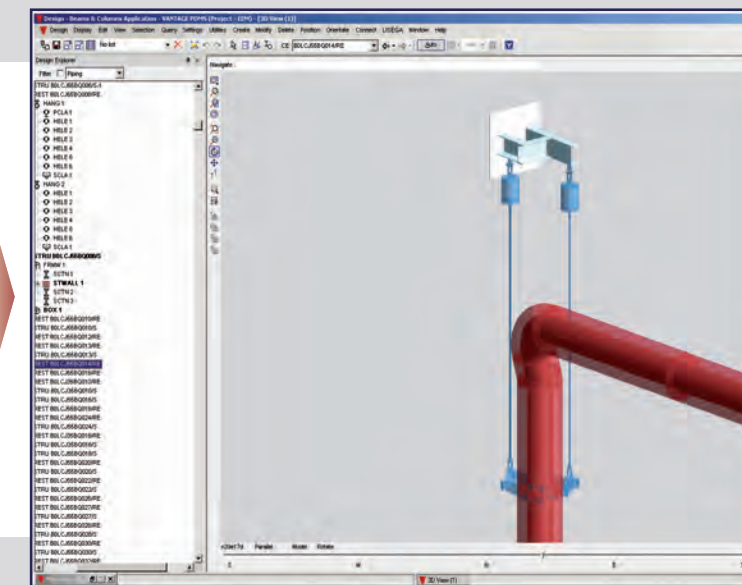
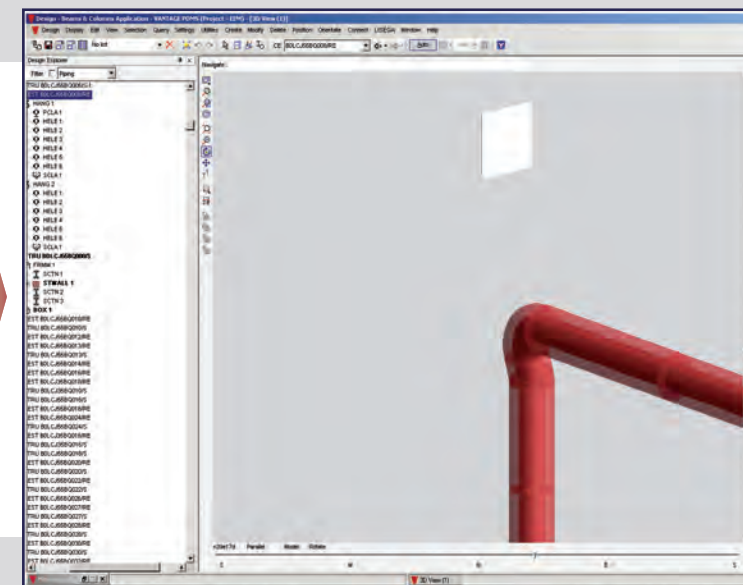
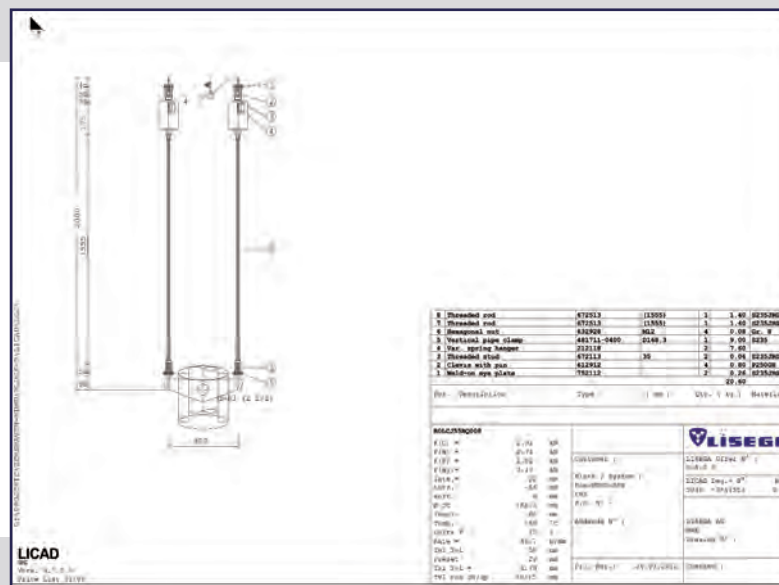


RESULTS -- Program KGRK2 BBS/31.0 -- Page 34
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Line 3 Point 129 # HR B0LCJ55BQ008
 Support in Absolute Coordinate System

Spring hanger

LoadCase	WX	WY	WZ	AQX	AQY	AQZ
	mm	mm	mm	mm	mm	mm
	mm	mm	mm	kNm	kNm	kNm
Dead Weight	-0.10	-0.15	0.00	0.000	0.000	-2.306
	-0.03	-0.26	0.10	0.000	0.000	0.000
Operation Load 1	-7.51	2.39	2.91	0.000	0.000	-2.712
	1.38	0.22	2.29	0.000	0.000	0.000
Operation Load 2	-1.46	1.37	2.14	0.000	0.000	-2.762
	1.35	0.53	1.28	0.000	0.000	0.000
Operation Load 3	-6.88	2.36	2.82	0.000	0.000	-2.718
	1.91	0.31	2.19	0.000	0.000	0.000
Earthq.dyn.1_X	51.28	13.63	2.88	0.000	0.000	0.165
	4.34	1.18	11.21	0.000	0.000	0.000
Earthq.dyn.1_Y	37.28	12.87	2.10	0.000	0.000	0.140
	-3.16	2.54	5.99	0.000	0.000	0.000
Earthq.dyn.1_Z	2.95	1.72	0.97	0.000	0.000	0.065
	0.41	0.39	0.98	0.000	0.000	0.000
Extreme value	-65.65	22.19	6.30	0.000	0.000	-3.113
	7.54	3.75	14.89	0.000	0.000	0.000
Hydraulic Test	-0.09	-0.15	0.00	0.000	0.000	-2.306
	-0.03	-0.25	0.09	0.000	0.000	0.000



Your information to us

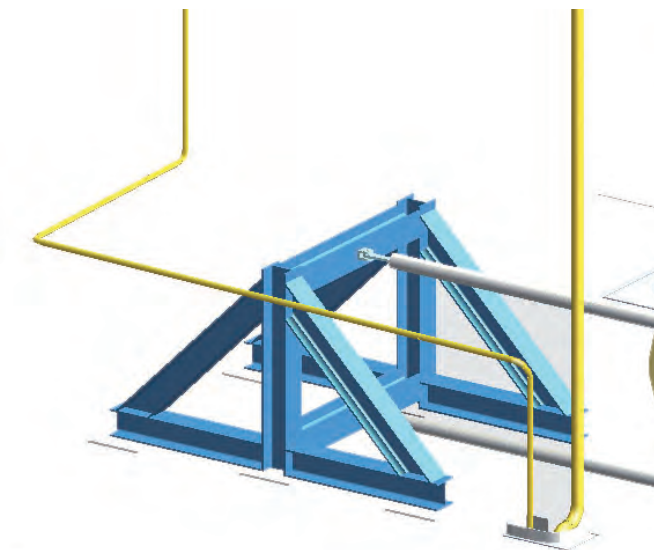
- Pipe stress analysis from any vendor (ex: Caesar) with loads and displacements
- Pipe diameters
- Temperatures and insulation thicknesses
- Piping material and corresponding piping and structural plans
- Plant specifications
- 3D model (e.g. PDMS SmartPlant)

Using your specification and information, LISEGA's selection program LICAD generates ready-to-install load chains from standard supports, from structural attachments right through to pipe-surrounding components.

Support design in the 3D model

For pipe support design in 3D, a model is made available to us, complete with pipe systems, steelwork and all structural components.

Via existing interfaces we can then develop support designs directly in 3D PDMS / SmartPlant with our LICAD design program and supplement them with the required steelwork. In practically all other 3D programs we can process the characteristic data needed for support design.

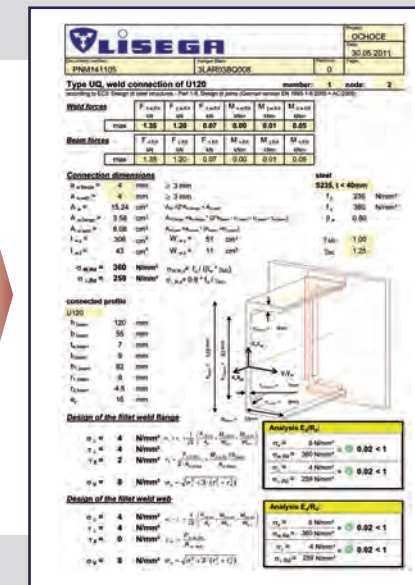
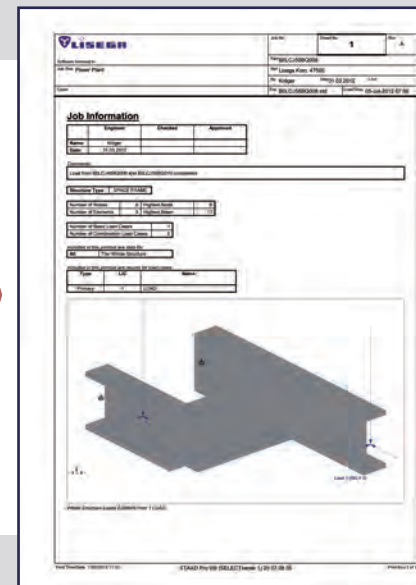
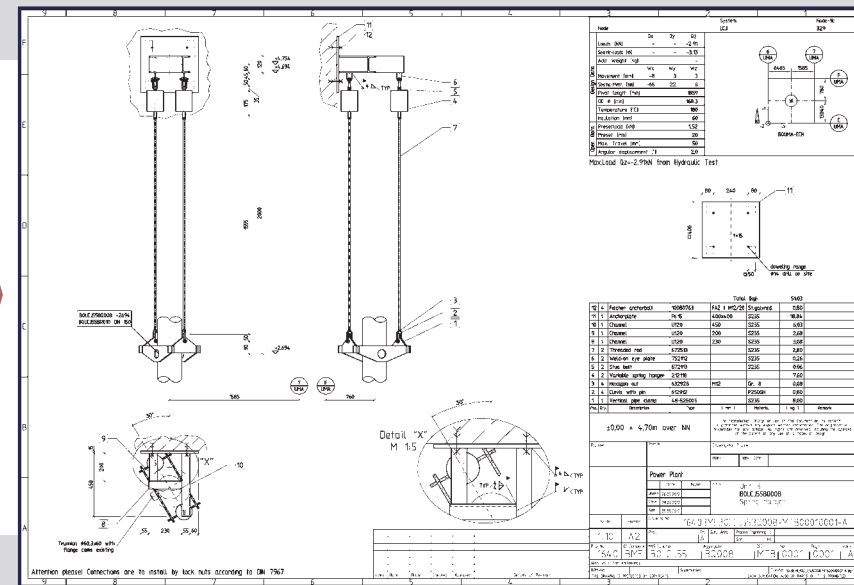
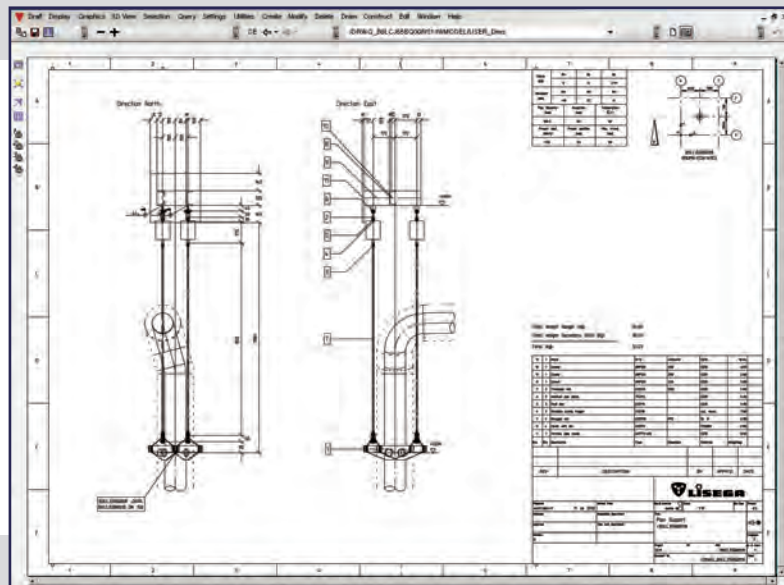
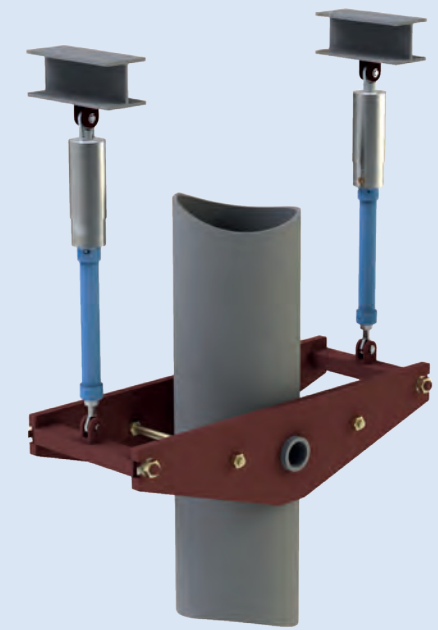


Statuslist LISEGA - Unit H0

pipe	hanger mark	function	building	Documentnumber	release for design	date of design	Rev	send to customer	2D	2D	LISEGA Kom: 47500	Send to sales department
1	HOLAA10BR050											
2	HOLAA10BR050	HOLAA10BQ001	GQ	HOUIMA	1640BMEHOLAA10BQ001-MTH00010001-A	28.09.2011						
3	HOLAA10BR050	HOLAA10BQ002	G	HOUIMA	1640BMEHOLAA10BQ002-MTH00010001-A	28.09.2011						
4	HOLAA10BR050	HOLAA10BQ003	GQ	HOUIMA	1640BMEHOLAA10BQ003-MTH00010001-A	28.09.2011						
5	HOLAA10BR050	HOLAA10BQ004	G	HOUIMA	1640BMEHOLAA10BQ004-MTH00010001-A	28.09.2011						
6	HOLAA10BR050	HOLAA10BQ005	GQ	HOUIMA	1640BMEHOLAA10BQ005-MTH00010001-A	28.09.2011						
7	HOLAA10BR050	HOLAA10BQ006	G	HOUIMA	1640BMEHOLAA10BQ006-MTH00010001-A	28.09.2011						
8	HOLAA10BR050	HOLAA10BQ007	GQ	HOUIMA	1640BMEHOLAA10BQ007-MTH00010001-A	28.09.2011						
9	HOLAA11BR010	HOLAA11BQ002	G	HOUIMA	1640BMEHOLAA11BQ002-MTH00010001-A	28.09.2011						
10	HOLAA11BR010	HOLAA11BQ004	G	HOUIMA	1640BMEHOLAA11BQ004-MTH00010001-A	28.09.2011						
11	HOLAA11BR010	HOLAA11BQ006	H	HOUIMA	1640BMEHOLAA11BQ006-MTH00010001-A	28.09.2011						
12	HOLAA11BR010	HOLAA11BQ008	H	HOUIMA	1640BMEHOLAA11BQ008-MTH00010001-A	28.09.2011						
13	HOLAA11BR010	HOLAA11BQ010	H	HOUIMA	1640BMEHOLAA11BQ010-MTH00010001-A	28.09.2011						

What we offer

- Selection of load chain components
- Issue of parts list related to load chains, with weights and material data
- Generation of LICAD drawings for support points
- Generation of 3D models using corresponding programs, such as SmartPlant (Intergraph) or PDMS (Aveva), incl. steelwork
- Documentation of the technical procedures
- Execution of clash analyses based on 3D models
- ...further services
 - Development of support concepts
 - Pipe stress analysis
 - Generation of typicals, the economical alternative for support design
- Anchor plate inspection
- Material summaries of complete projects
- Support design with the customer at the plant
- Assembly aids for fittings
- Certification for secondary steelwork, anchors or weld seams
- Calculation of structural attachment loads



Generation of drawings

A 2D drawing is generated directly from the PDMS model with parts lists, site plan and all technical specifications.

All data are stored as data sets and can be further processed as data sets. The title block can be individually designed.

Anchor plate certificates

Individual certificates for most anchor plate manufacturers can be supplied with the aid of the relevant design programs. For economical planning we have developed a standard that can make the individual certificates superfluous. If required, the documentation on this can be supplied.

Welding certificates

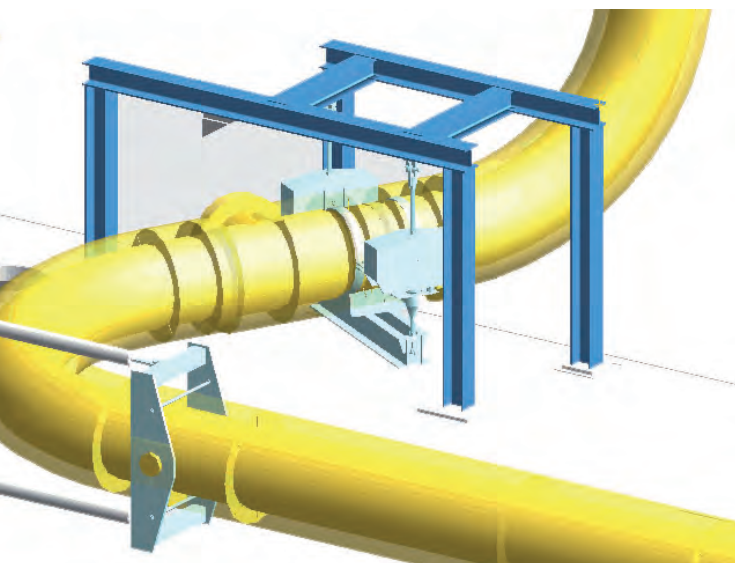
In accordance with specified codes, individual welding certificates can be supplied for steelwork connections.

Calculations for secondary steelwork

LISEGA provides computerized certification for the dimensioning of the planned secondary steelwork according to AISC or EURO. This validation is provided by the StaadPro statics program.



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