

3D CHECKPOINT

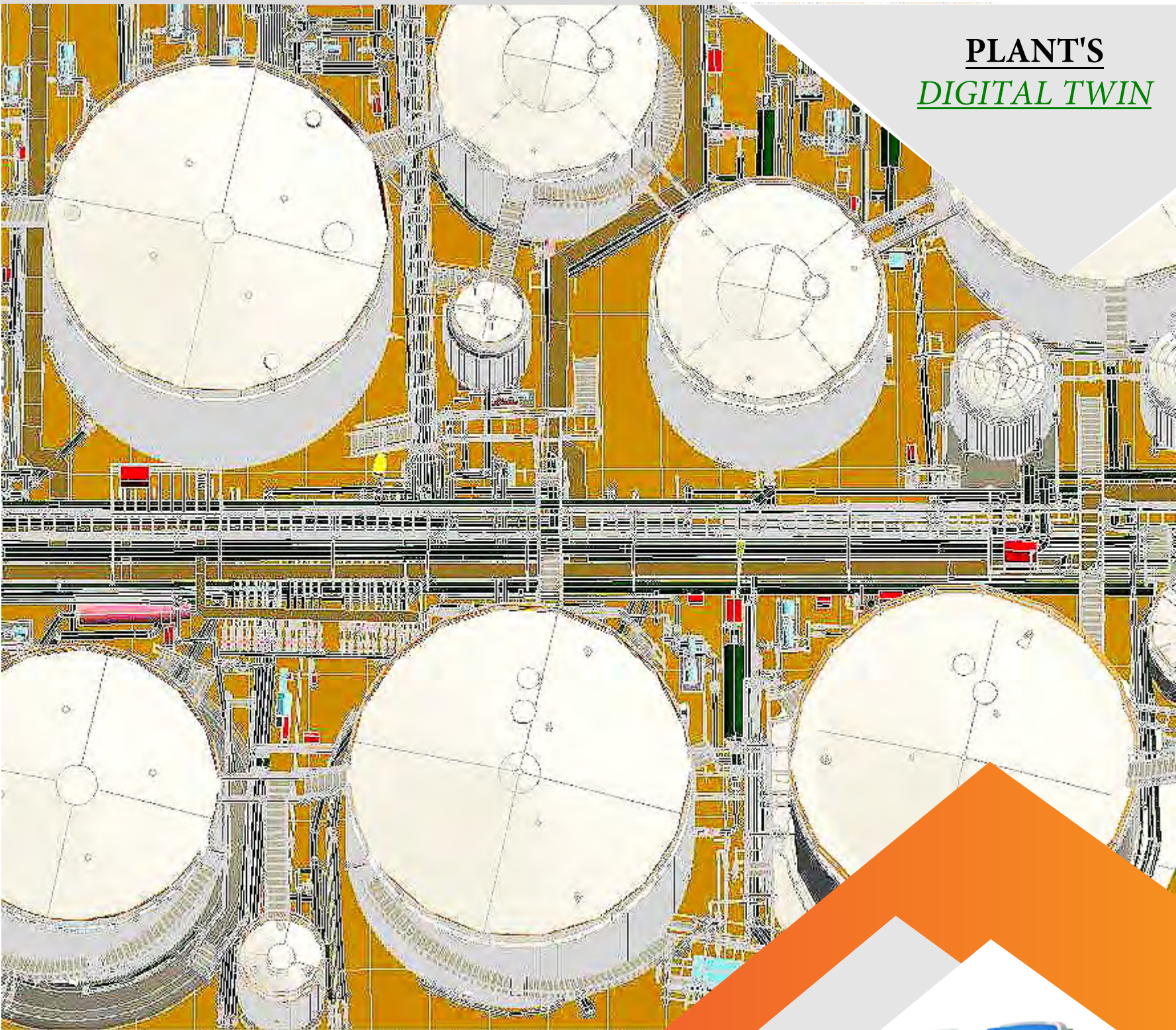
ADVANCED 3D ENGINEERING SOLUTIONS

BROCHURE



CHECKPOINT

PLANT'S
DIGITAL TWIN

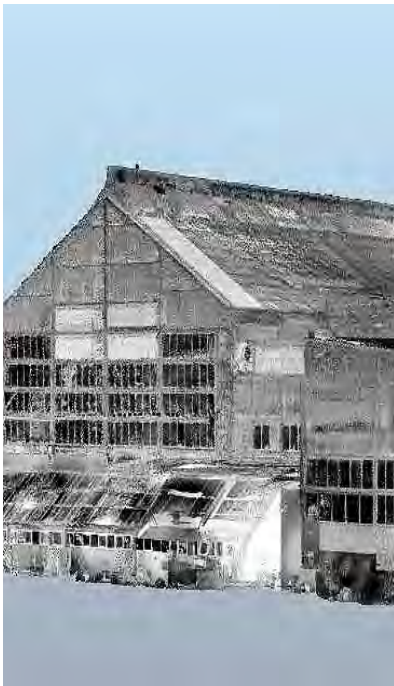


3D LAZER SCAN
MODELLING
ANALYZES
PRINT



3D CHECKPOINT SERVICES

POINTCLOUD

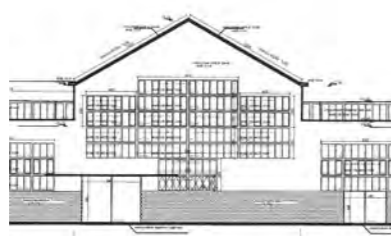


VALUE

3D Laser Scan's first output is the point-cloud. We can use for survey drawings, process it for 3D Model or we can use it for analyzes.

High quality, precise pointclouds are just an important plant's asset for the next century.

SURVEY

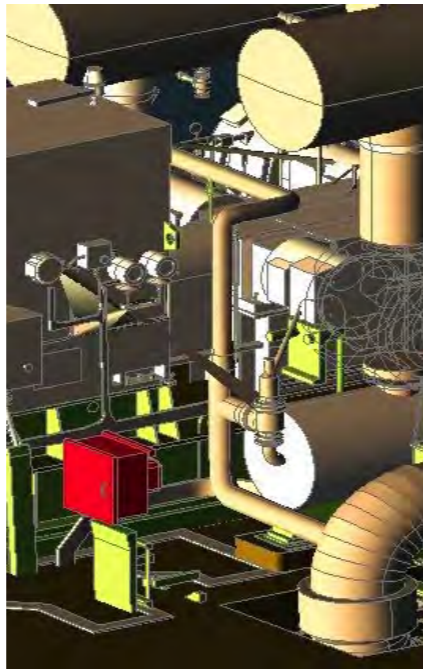


ARCHITECTURAL OUTPUTS

From pointcloud data we can draw the general floor plans, cross sections and facades.

We can also get the floorplans from 3D Model. When we need more details like equipments, secondary level structures and major energy lines etc, then getting plans from the 3D Model is more accurate and precise besides the different options.

3D MODELLING

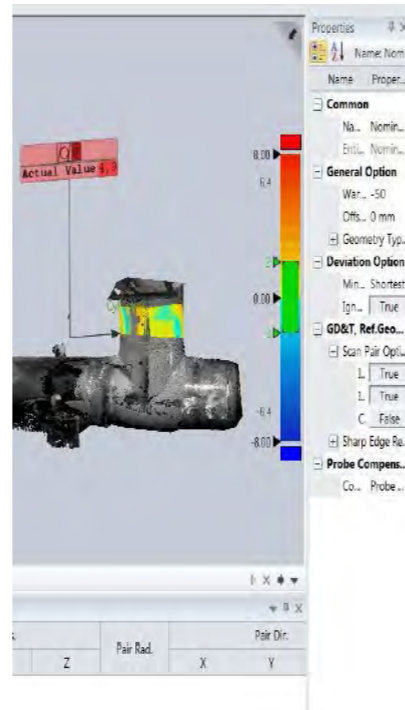


FULL PLANT SIZE

For multi-storey multi-level production facilities spread over thousands of square meters are plants difficult to operate without a 3D Model.

For your asset management with an economical plant life, 3D Model is the best solution at hand.

ANALYZES



ENGINEERS' VIEW

- Fluid Dynamic Analyzes
- Finite Elements Analyzes
- Pipe Stress Analyzes
- Structural Stress Analyzes
- GDT Analyzes
- Verticlaty Analyzes
- Volume Calculations

VR



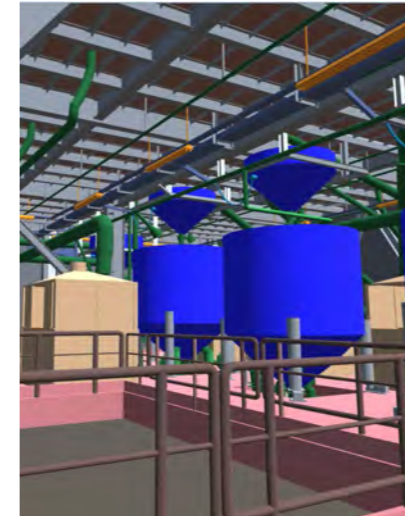
VR FOR TOUR

In a Virtual Reality Project, your system is reproduced visually and also behaviorally.

You can take your facility *to the businessmen* who visit your stand at the fairs. From discharging lines to your pumping station, to tanks, to production till packing. You can share only the chosen details about your operational capacity.

New employee trainings can be run also on VR.

AR



AR FOR SAFETY AND SERVICE & MAINTANANCE

Augmented Reality is an one step higher level then VR. This is a developing technology, but first time used for work safety. It can also integrated with maintenance and sservice departments needs. Both technologies can be tailored according to spesific needs of the plants.

3D PRINT



PROTOTYPING & FAST PRODUCTION

For limited quantities fast and reliable model can be printed by FDM, SLS, SLA, MJF, DMP or CLIP technologies. Materials are thermo-plastic so you can get , accurate and reliable models. For high surface smoothness, HP Jet Fusion technology is number one.

3D PRINTER



ZORTRAX 3D PRINTERS

- M300 DUAL
- M300 +
- M200+
- INVENTURE
- INKSPIRE
- ENDUREAL
- FILAMENTS AND RESINS
- Z-ABS
- Z-ASA Pro
- Z-ESD
- Z-GLASS
- Z-HIPS
- Z-PCABS
- Z-PETG
- ...

IMPORTANT DATES

INHOUSE OFFICE TRAININGS

03 FEB Metrology Training

10 MAR Tank Analyzes

11 APR 3D Printer Training

18 MAY Work Safety and VR

EDITOR'S NOTES

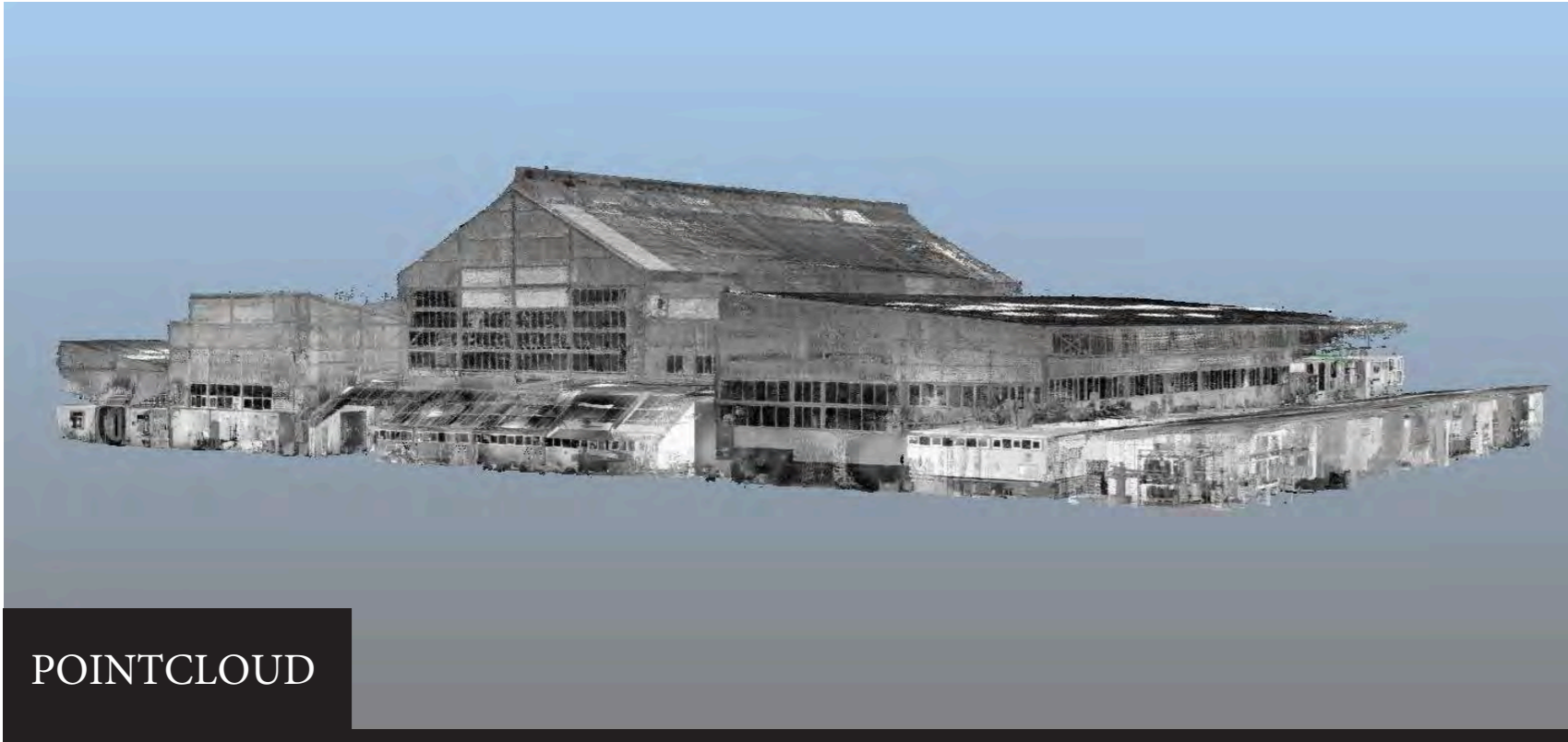
-Field work continues by informing customers and potential partners by daily reporting for long term projects.

-3 Main basic points for pre-work order:

*Laser Scanner is not an x-ray , it doesn't see anything what human eye cannot see, like underground piping or etc..

*Laser Scanner collects 967.000 coordiante points per second. That means, all your buildings and equipments will be gathered as it is with cracks, dirt or deformations.

*For colouring and seperation by layers, we will perform as our knowledge unless you give us a written description



POINTCLOUD

We can always offer 3D laser scanning service for the parts but when it comes to large size there are certain elements gets importance for successful finishes. 3D laser scanning performance for a full size plant can be around 150 - 200 acres and needs to run smoothly all the way from the beginning. Following the 3-D scan, which includes the complete buildings and production facilities of the plant in detail, we can deliver you certain portfolio, like starting with measurements of the plant at high accuracy. Raw data which consists of millions of coordinate points, needs a registration process because we gather all coordinate points in may be 800 - 900 positions.

Registered pointclouds is the first outcome effectively deliver us the mathematical model of your plant. The digital information obtained by the 3D Laser Scanner is transferred to the workstations and the raw data obtained here is interpreted into a valuable data set and a 3-dimensional pre-mathematical model is produced (described as point cloud). This is called the post processing step, and at this step we can deliver you fish-eye photographs from each scan position, which reflects the 3D environment in 2d screens.

From this mathematical model, we can draw 2D layouts, showing all primary facility settlements. As mostly requested, lay-outs can be drawn for the entire plant, specific work zones and even for every individual floor for indoors.

An orthophoto, orthophotograph or orthoimage is an image, geometrically corrected. This is a 90 degrees perpendicular view which is exactly a photograph. We can also obtain 'orthophoto' from pointcloud that helps architectures import the image into software to draw the facade.

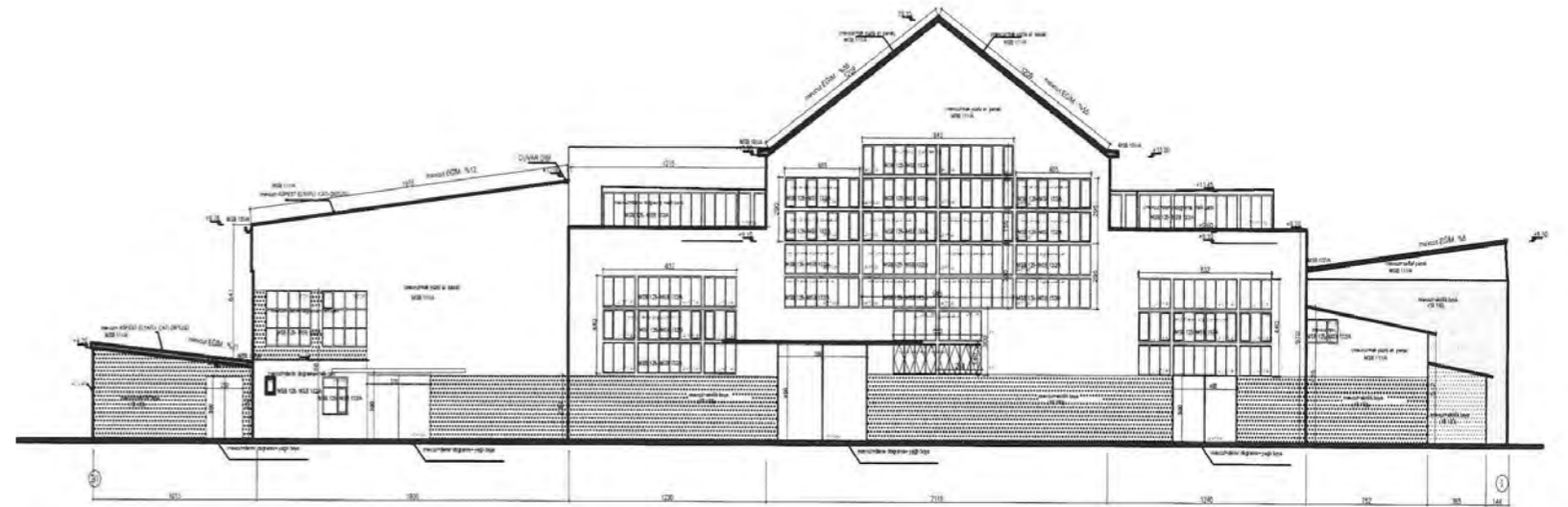
ARCHITECTURAL SURVEY DRAWINGS

The single or multi-storey building, structure, old structures to be evaluated as architectural projects are scanned by laser scanner and the drawings can be delivered quickly. The field measurement and drawings for the indoors and outdoors registered together at the same coordinate system. In any architectural project you can easily benefit from listed applications below;

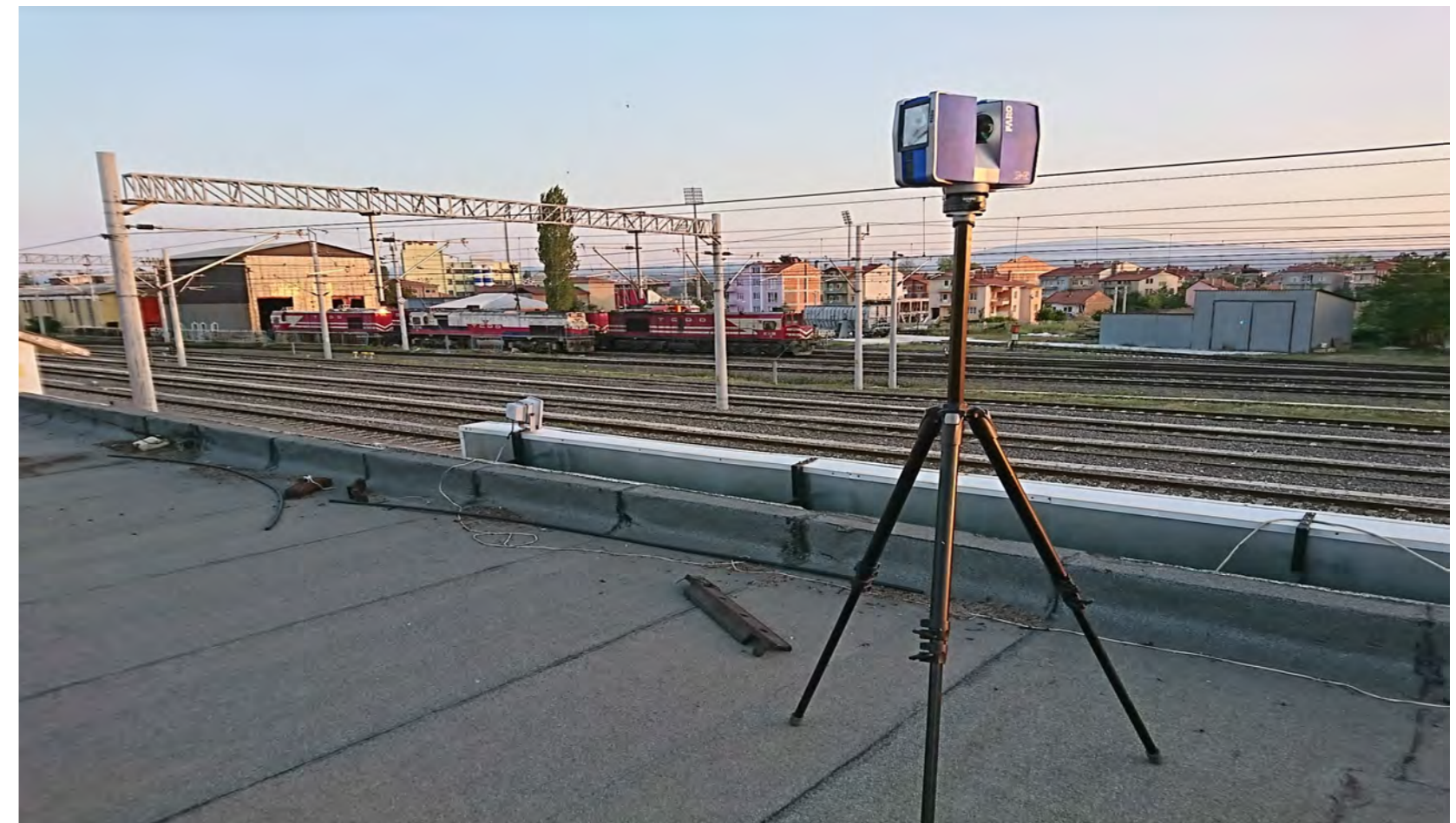
- Sections & Cross Sections,
- Plans,
- Facade,
- 2D Documentation,
- 3D Documentation,
- Measurement of inside and outside of buildings for earthquake strengthening,
- Screening for facade cladding,
- Screening for interior decoration.

We can deliver the pointcloud in various formats. Primarily the native pointcloud format is *.fls which we can convert for your software. If your work will continue in Autocad, we can deliver in Recap format. PTS, PTX, OBJ, VRML is some other formats. Today many softwares are supporting the pointclouds, so just let us know which software you will use for the rest of your project.

In cases like historical structures, we can always deliver you the 'colour pointcloud'. When we have the colour scans, then automatically we have the colour positional photographs and colour orthophotos. Just to keep the files sizes in moderate values, sometimes it is your choice to run the scans in black/white and have the colour option only for rich details.



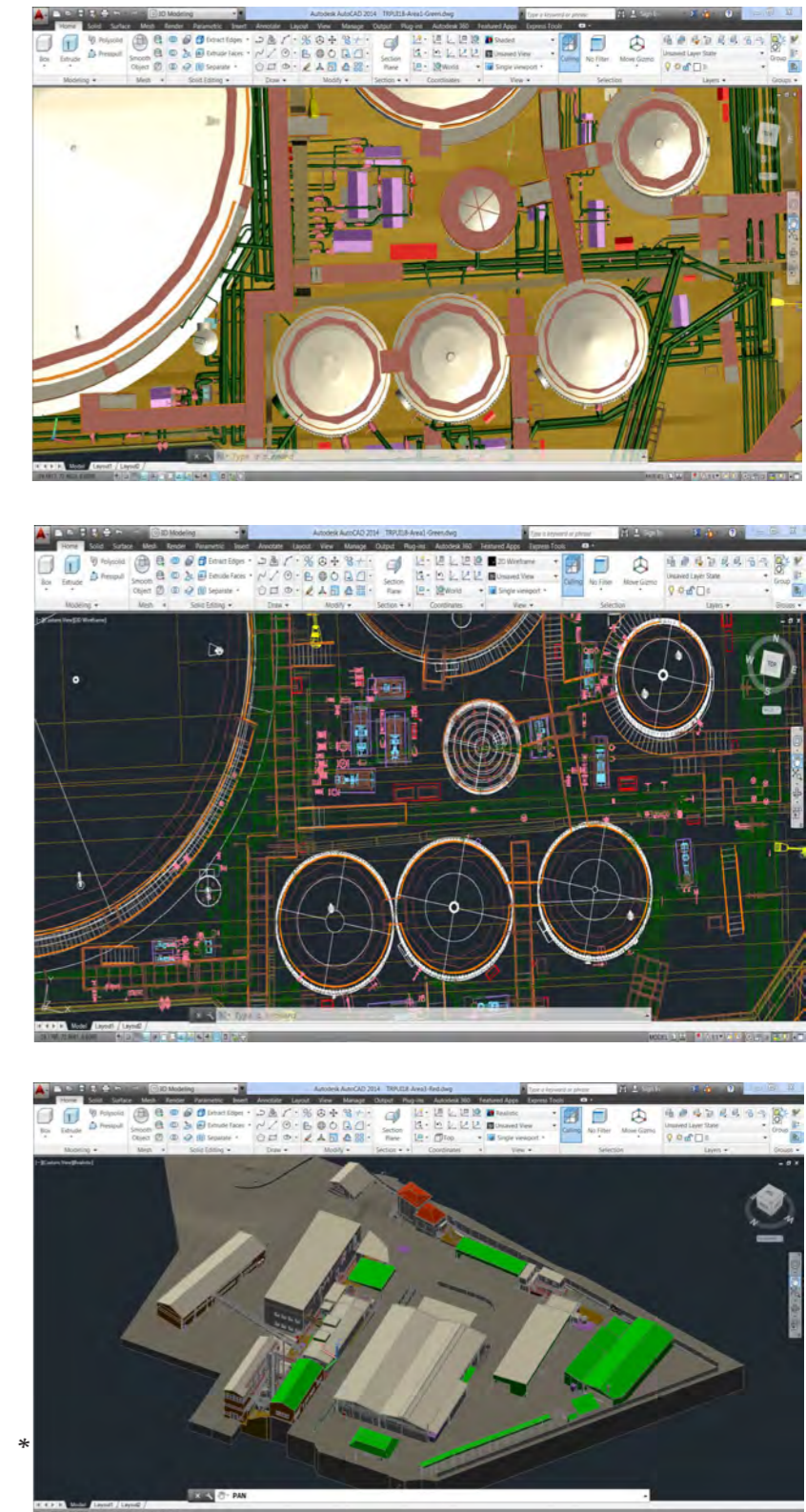
SURVEY DRAWINGS



Everybody wants to get ahead,
 "If you have already set a plant, that means you have lots of details to think about everyday. Regulations are changing fast with the increase attention to work safety. Competitive positions are so dynamic, sometimes you must re-think about your business' future. In this environment 'Digital Twin' of our plant looks the best investment in the last ten years. and additionally this will fit all our needs better than any other technologies in the next ten years including service and maintenance."
A Petrochemical Professional



For Petrochemical Plants all 3D Modeling and designs are under the ISO 10628 standard.



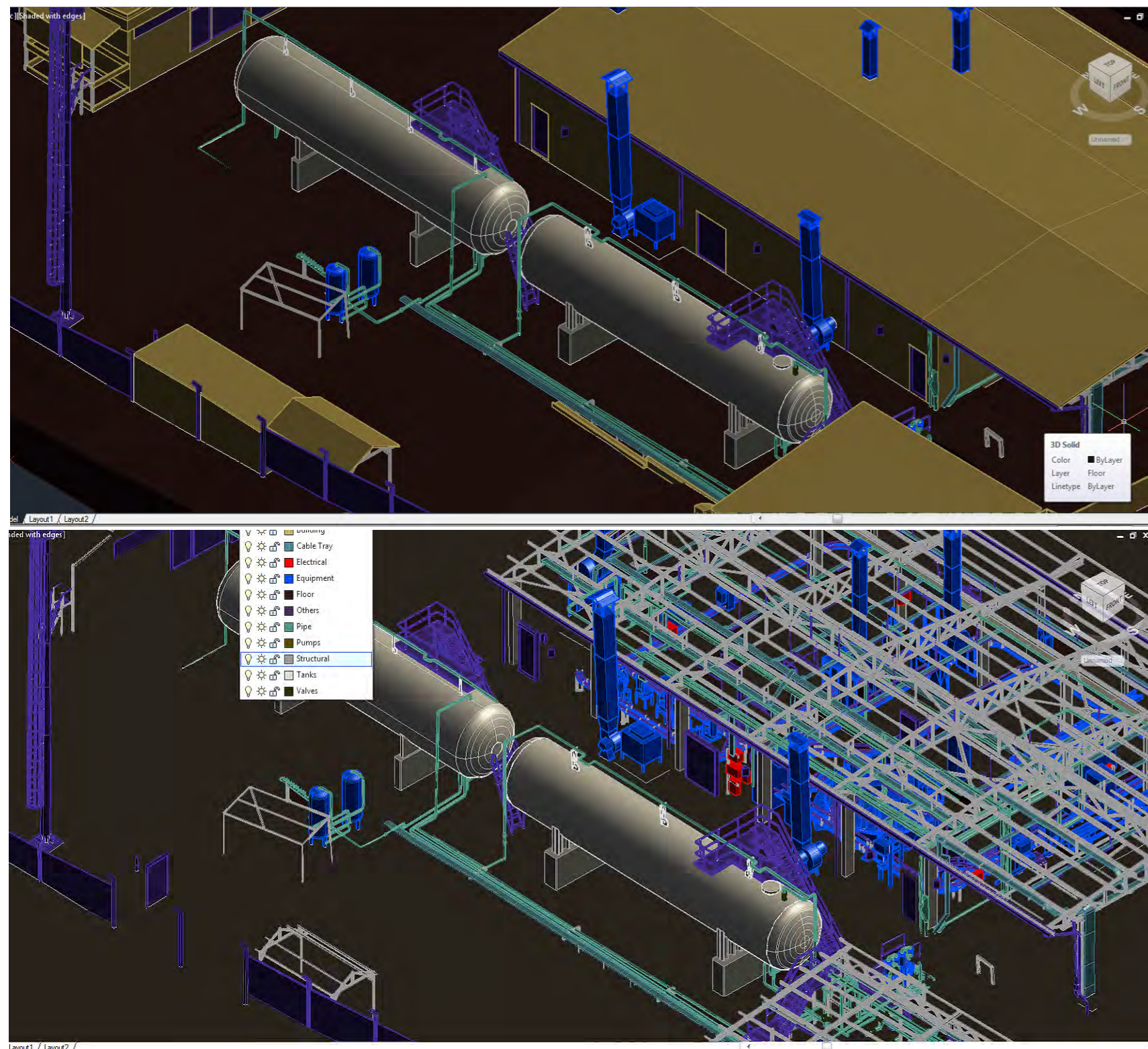
We can deliver 3D laser scanning service for a full size plant. The digital information obtained by the 3D Laser Scanner is transferred to the workstations and the raw data obtained here is interpreted into a valuable data set and a 3-dimensional pre-mathematical model is produced (described as point cloud). This step is the process of post processing phase. From this mathematical model, we can draw 2D layouts, showing all facility settlements. It is also possible to create the 3D Solid Model from the same pointcloud. PID Graphics can be extracted from the 3D model as well as labeling and coding performed under the required standards. 3D Model is suitable for various engineering analyzes. At this point you will no longer waste time and money on re-measurements or mis-calculated invoices when you are providing any additional construction or subcontracting services. It is also possible to translate your 3D Solid Model into '3D Smart Model'. With the intelligent model it is possible to label all of your equipment, fittings, pipelines, electrical panels, cable roads, aircondition channels and all such installations and all primary and secondary level instrumentation in the plant. These models are made in full detail from the pipe diameters to the inside of the tanks, from the flow direction to the limit switches or sensors on it. Following this 'intelligent' model, it is possible to extract the desired PFD (Process Flow Diagrams) and P & ID (Piping and Instrumentation Diagrams) graphics.

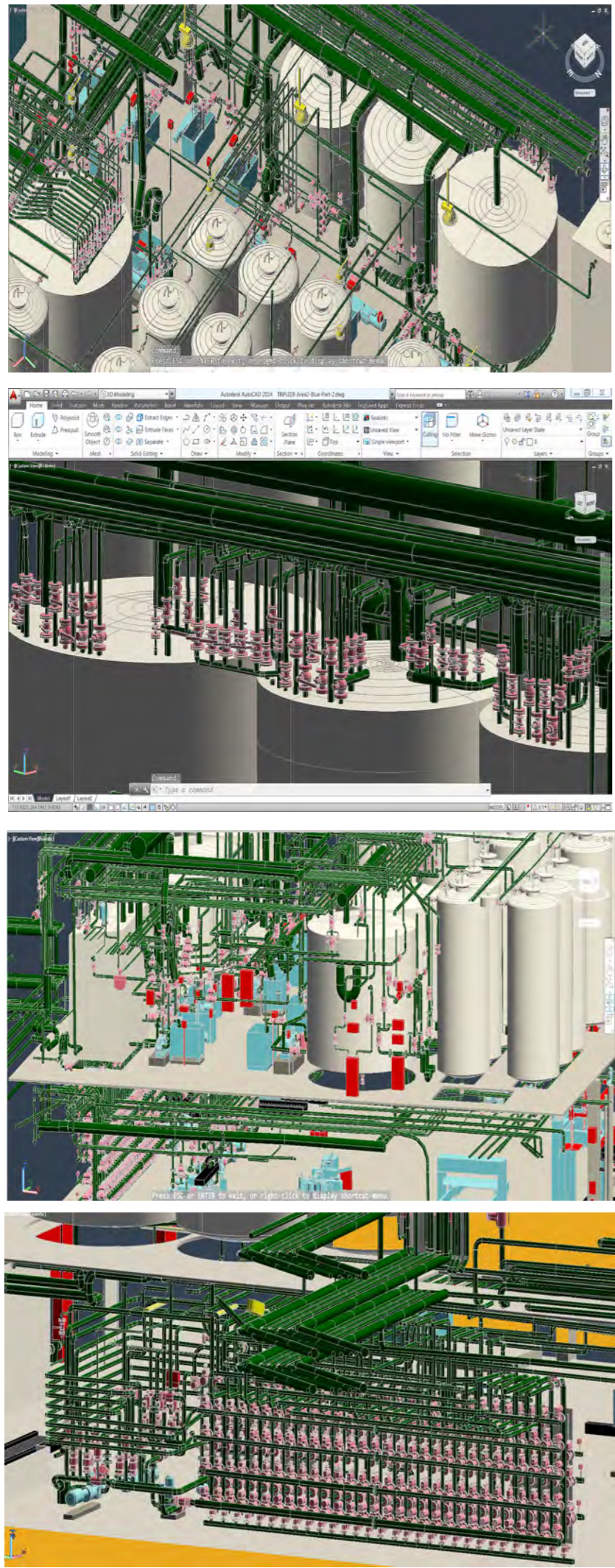
3D MODELLING

INDUSTRIAL PLANT MODELLING

HARDCORE

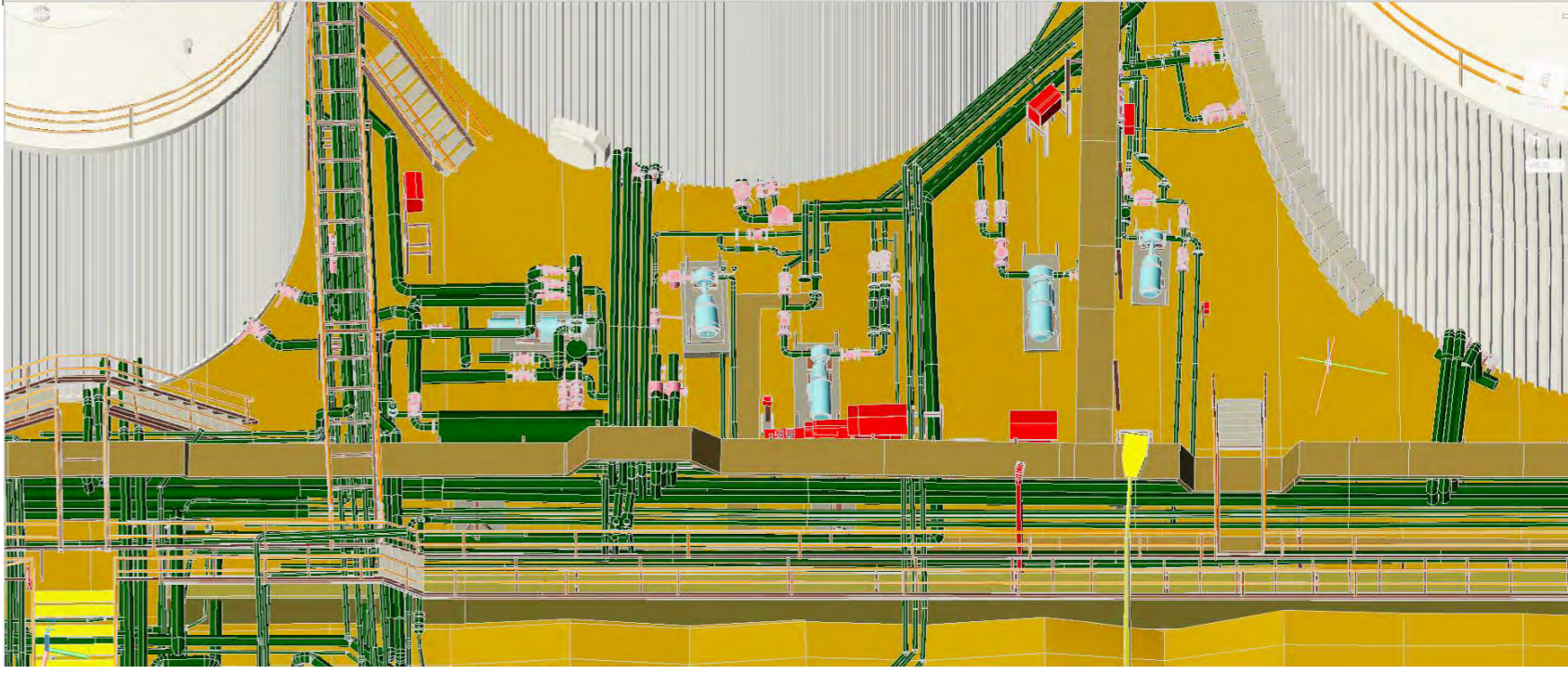
- 3D SCAN
- 3D MODELLING
- ARCHITECTURAL SURVEY DRAWINGS
- PIPELINE ISOMETRICS
- P&ID
- VR FOR WALK THROUGH TRAININGS
- AR FOR WORK SAFETY





Projects; is defined as taking field surveys and perform technical drawings services as the 2D Layout Plan of the defined production process and instrumentation system which always consists the surrounding back-up systems:

In general work flow starts with process of the production and filling units of the facility; starting from the tanker / truck filling / unloading station, stock tanks, pipelines, fillings, transfer tanks, all fluid consumption lines, steam lines, hydraulic pipelines, fire lines, hydrophore water installation, gas inlet from the network, burner & heating systems, various compressors, air lines collectors, pumps and engines are all included without exception. It is aimed to make technical drawings and scaled drawing engineering works of two-dimensional floor plan to create piping, conveyor, equipment and instrument schemes up to production equipment and to loading warehouse. Existing static and dynamic process equipment and elements (major equipments such as filling and discharge, tanks, reactors, mixers, conveyors, coloumns, pump. and etc), piping, field instrumentation and control system of primary elements (including secondary level elements) including elements like valves, actuators, transmitters, gaging and denunciations,) equipment and instrument locations, and precise vector measurements of all instruments and visible central control units will all be scanned by 3D Laser Scanner.



‘Digital Twin’ of Stock Tank Farm:
“Stock tanks or transferring tanks modelled with all surrounding details like pumps, pipes, filters, sensors, control units, collectors, etc and you can review the entire line from tank to production...”



‘Digital Twin’ of production:
“All Reactors and mixers modelled with all details like sensors, valves, flanges, drains...”

CHEMICAL PLANTS

PIPE-LINES

For Young Engineers

Mostly it is very difficult to follow up the lines without proper documents. Engineers who start working in such environments mostly value the experienced staff then the documents. This is why it takes a lot of time for one person to get to know for the entire plant. But having the 3D Model changes everything. One can understand the entire facility, within minutes. Even for daily problems before you become an experienced engineer, you can check the Model and have the same right outcomes as your senior officers



PETROCHEMICAL PLANTS

STANDARDS

We have created a high grade sector-specific library, that we have developed over time and includes all steel works, piping & fittings, process equipment, ductwork, wiring and standard line machining in European & ASME / ANSI standards.

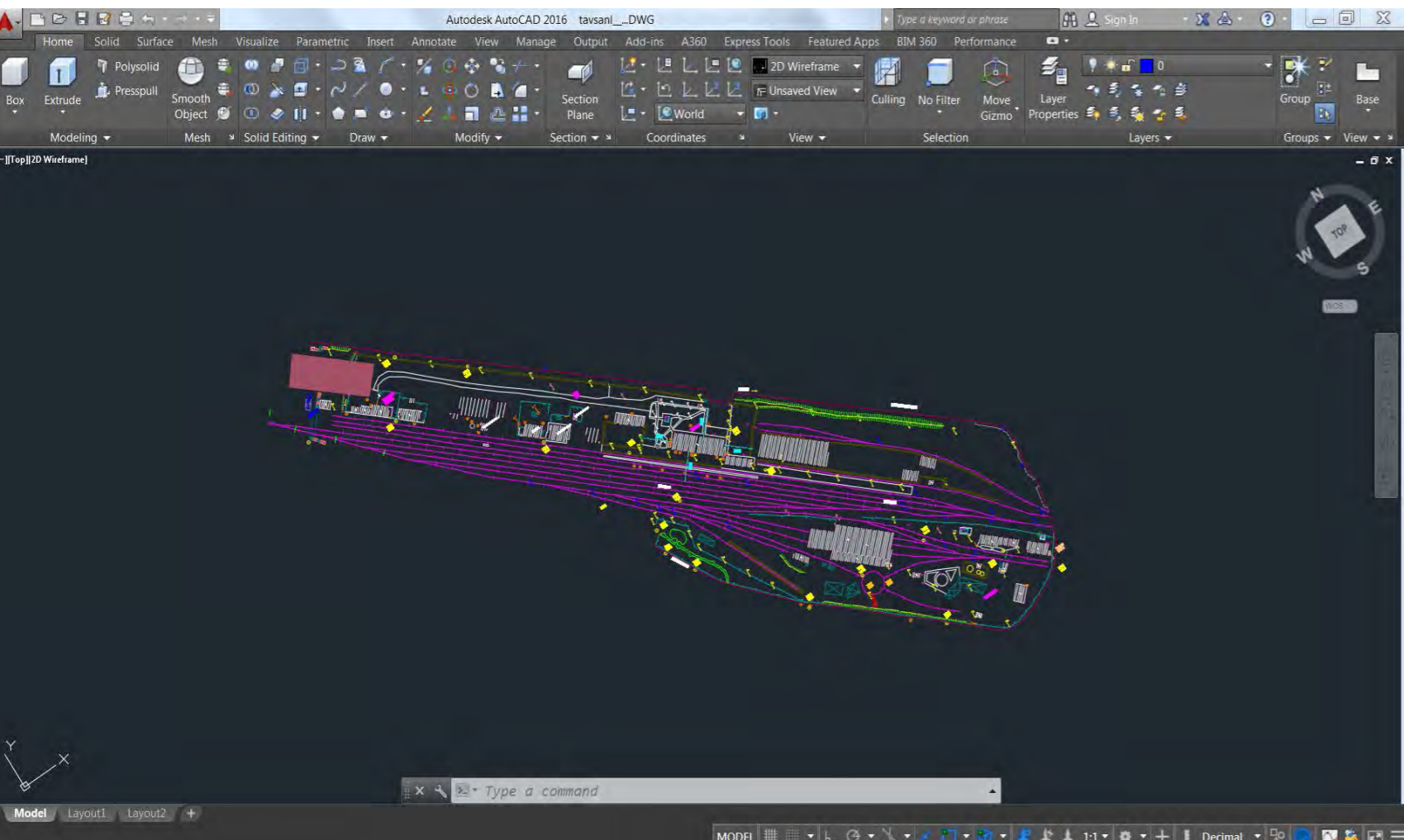
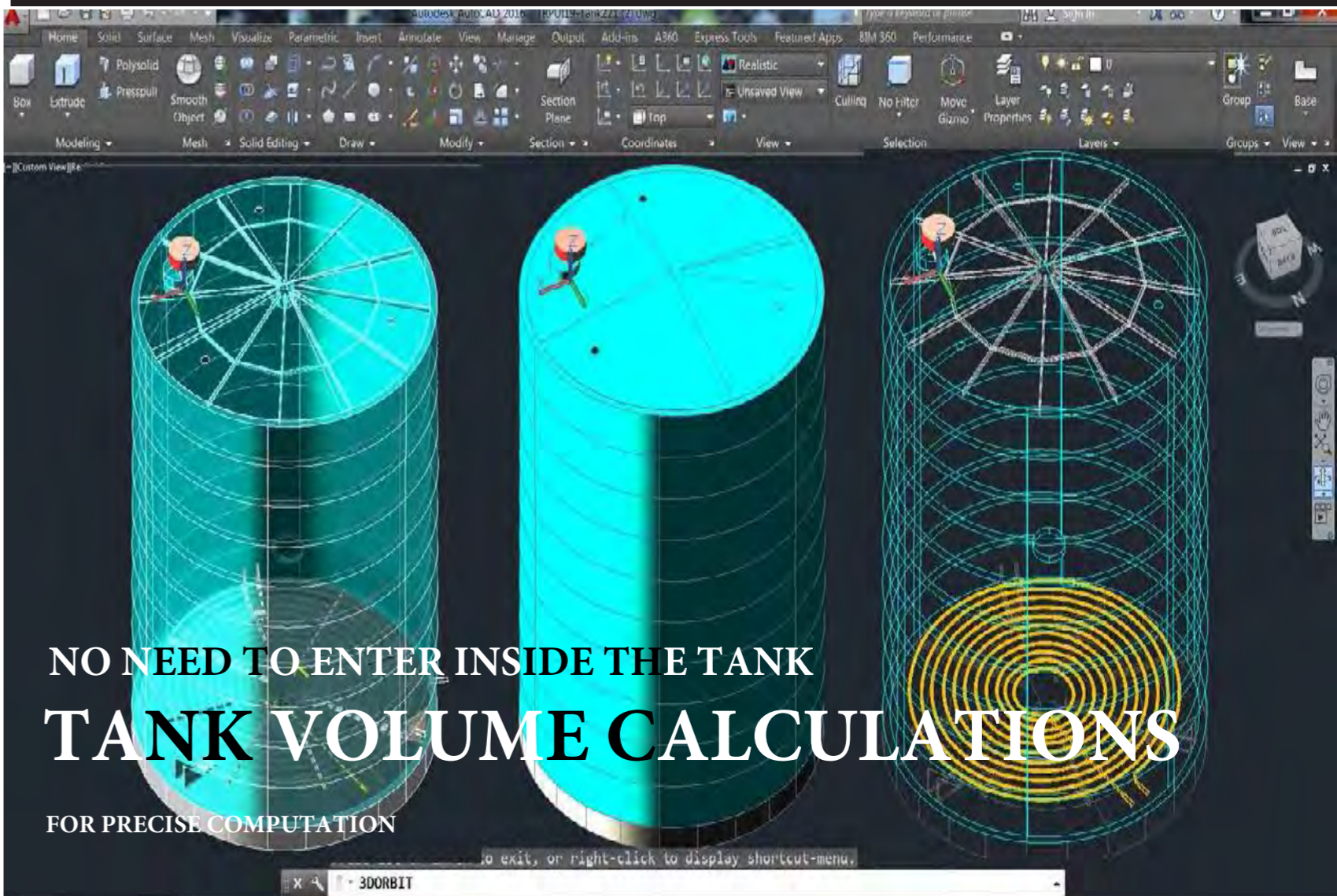
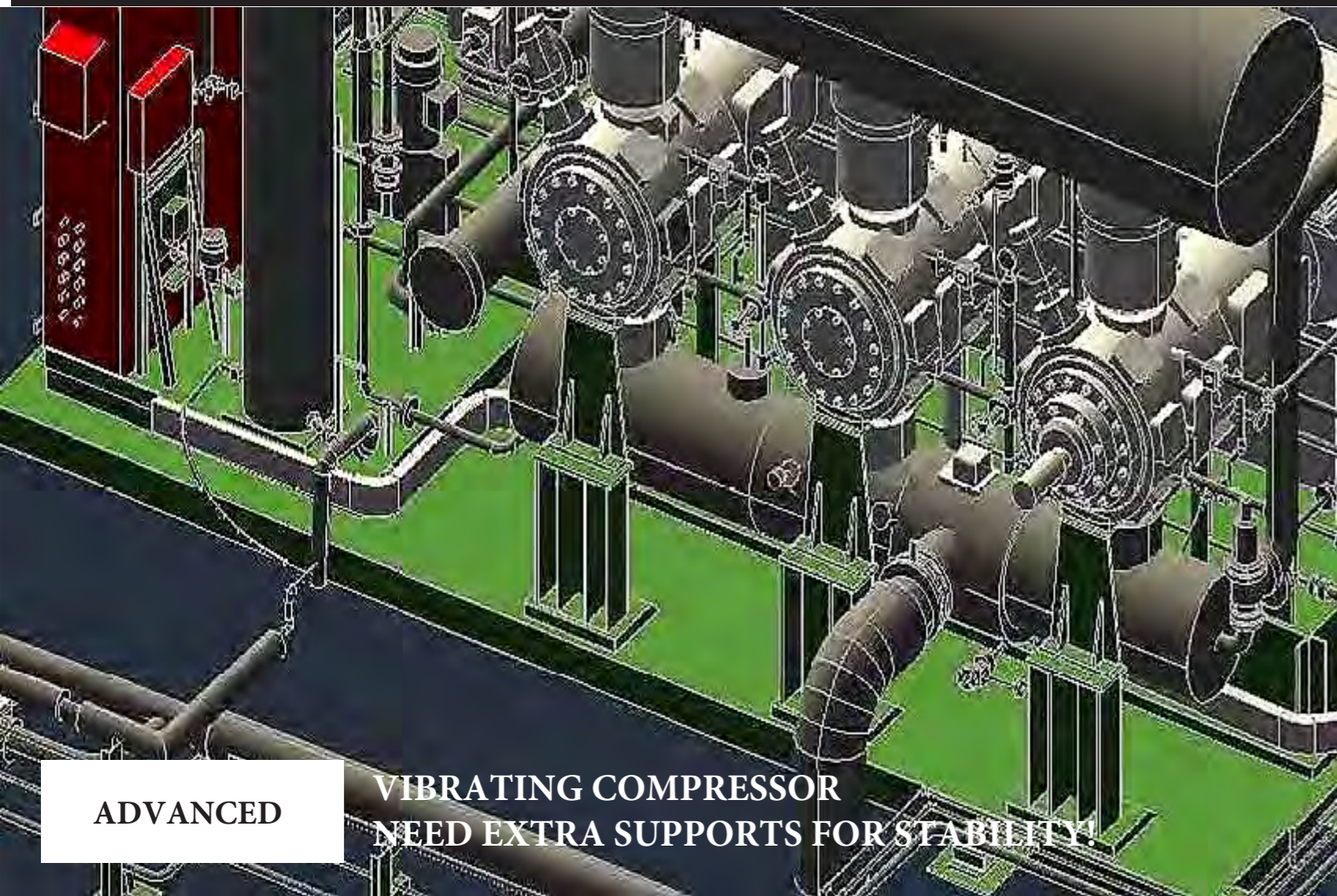
If there are any special requests about your company preferences, international standards and national standards and regulations (VDE, ISA, TS, EN) are evaluated together and drawings are prepared in a way that will be most suitable for them; equipment and instrument demonstrations in piping and diagrams and all automation-related representations, if any, will be displayed in accordance with ISO standards.

As an example of international standards for drawings; ISO 15519-1, "Specifications for diagrams for process industry

ISO 15519-2 - Part 2: Measurement and control standards general

ISO 10628 Diagrams for the chemical and petrochemical industry "standards will be used.

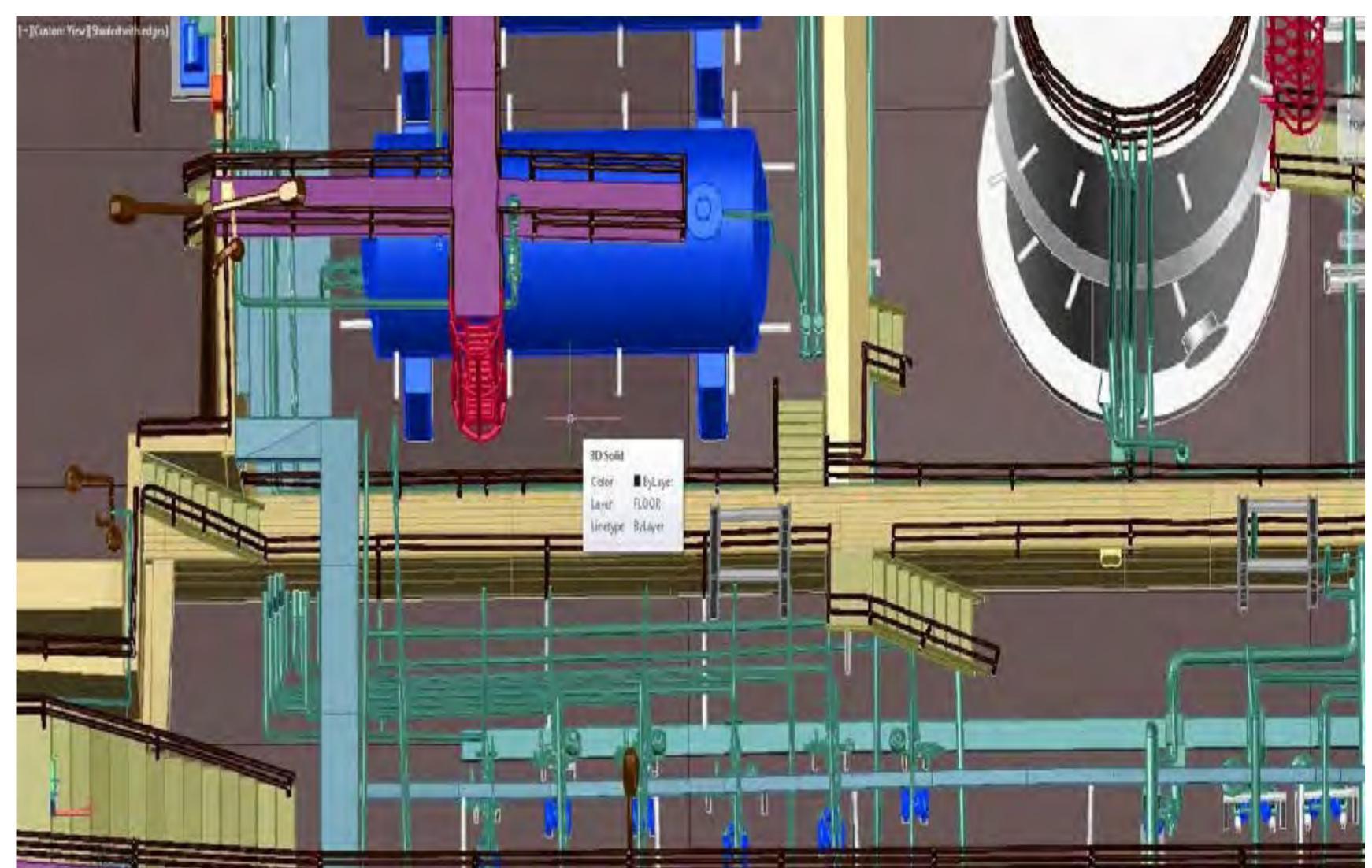
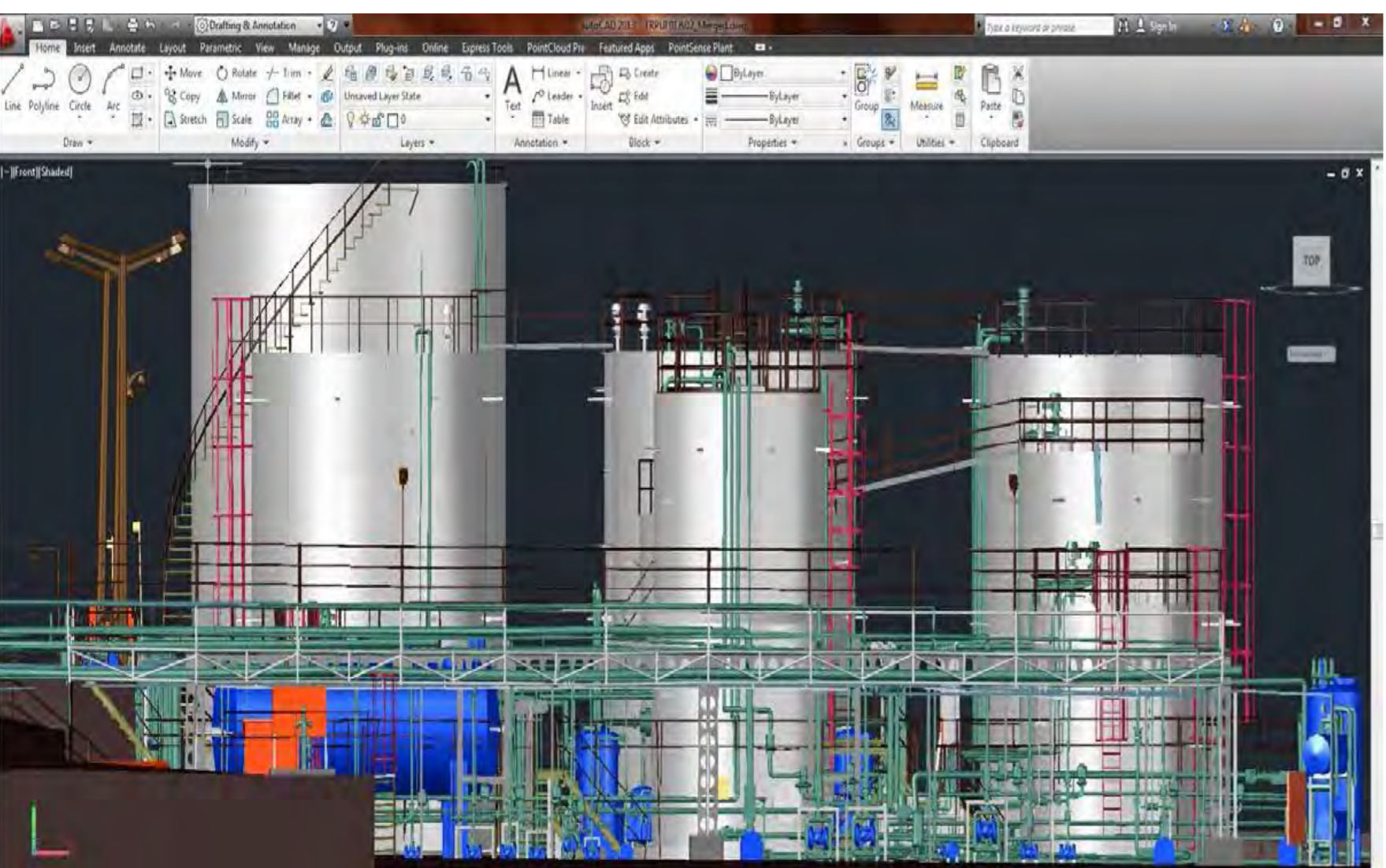
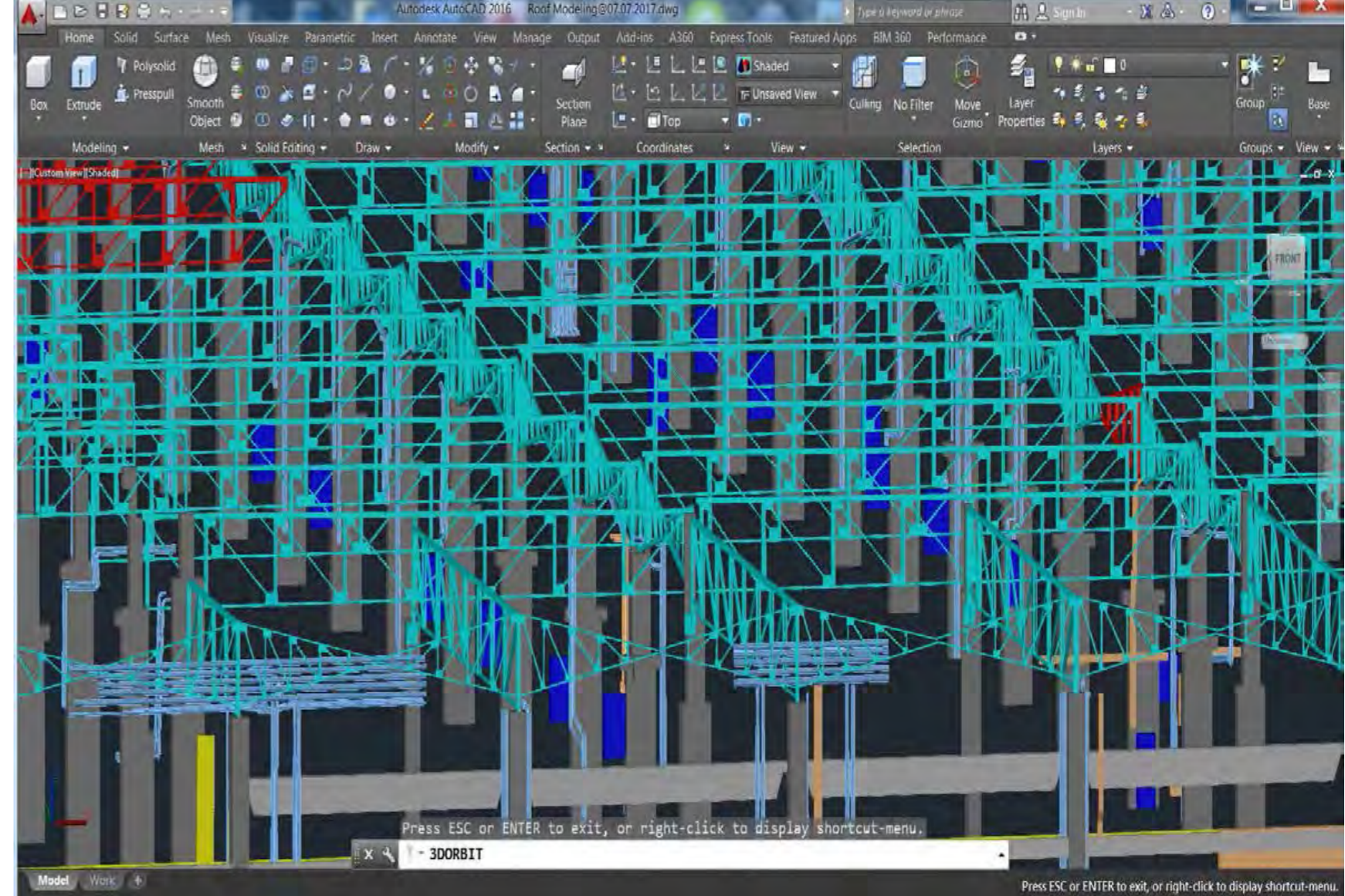
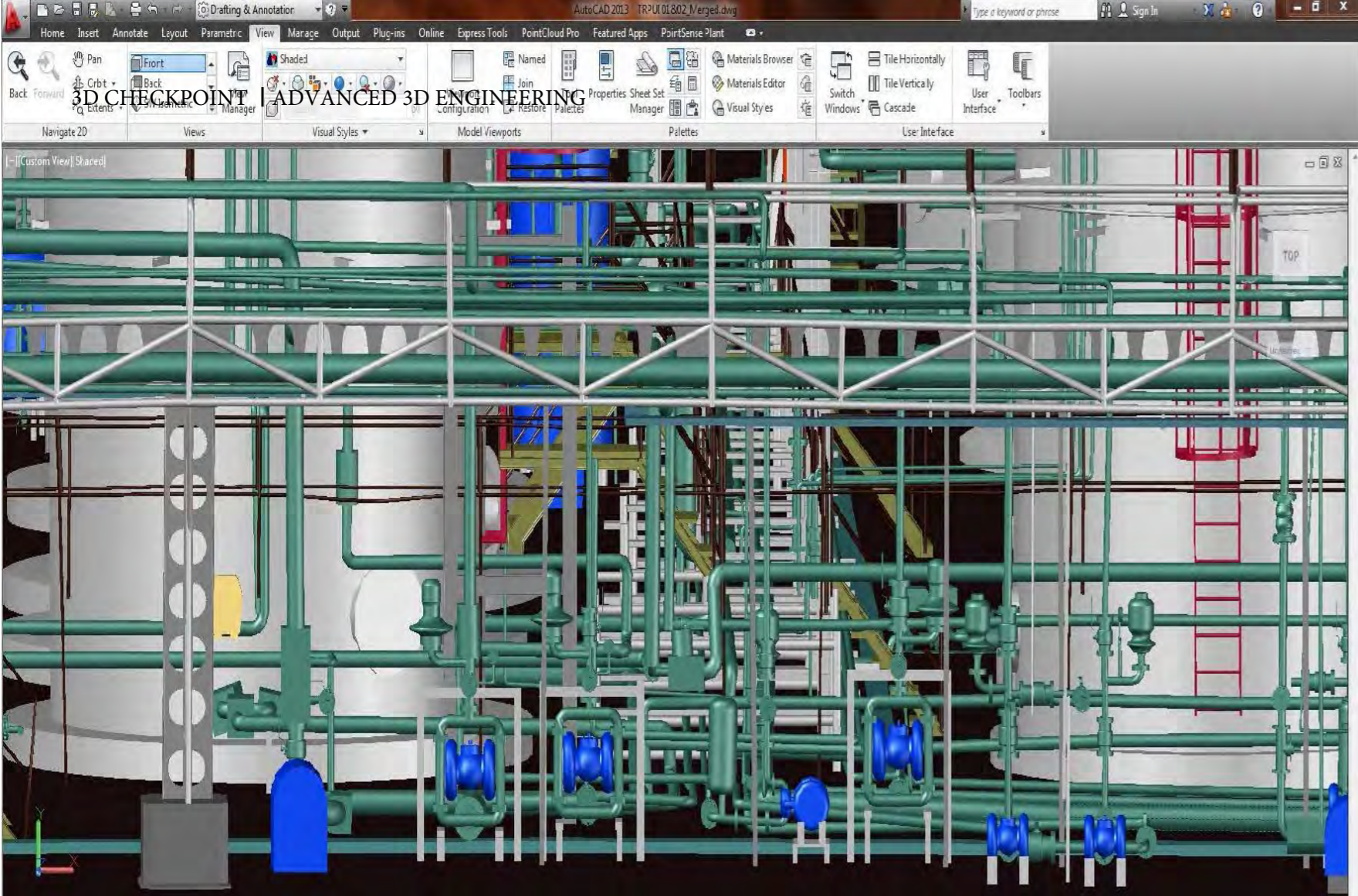
Petrochemical Plant with seaport, outdoor stock tanks and a complex production structure.

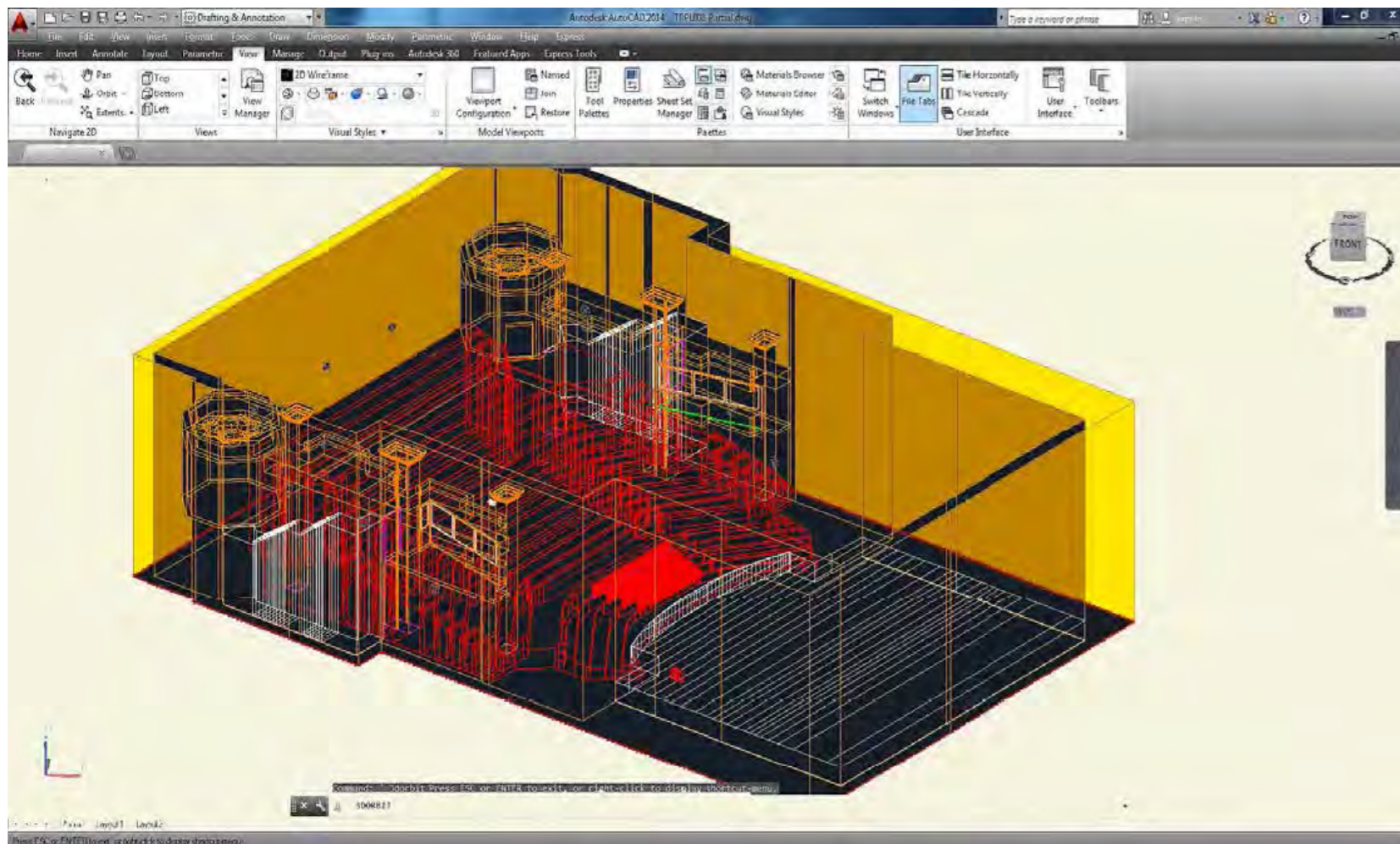
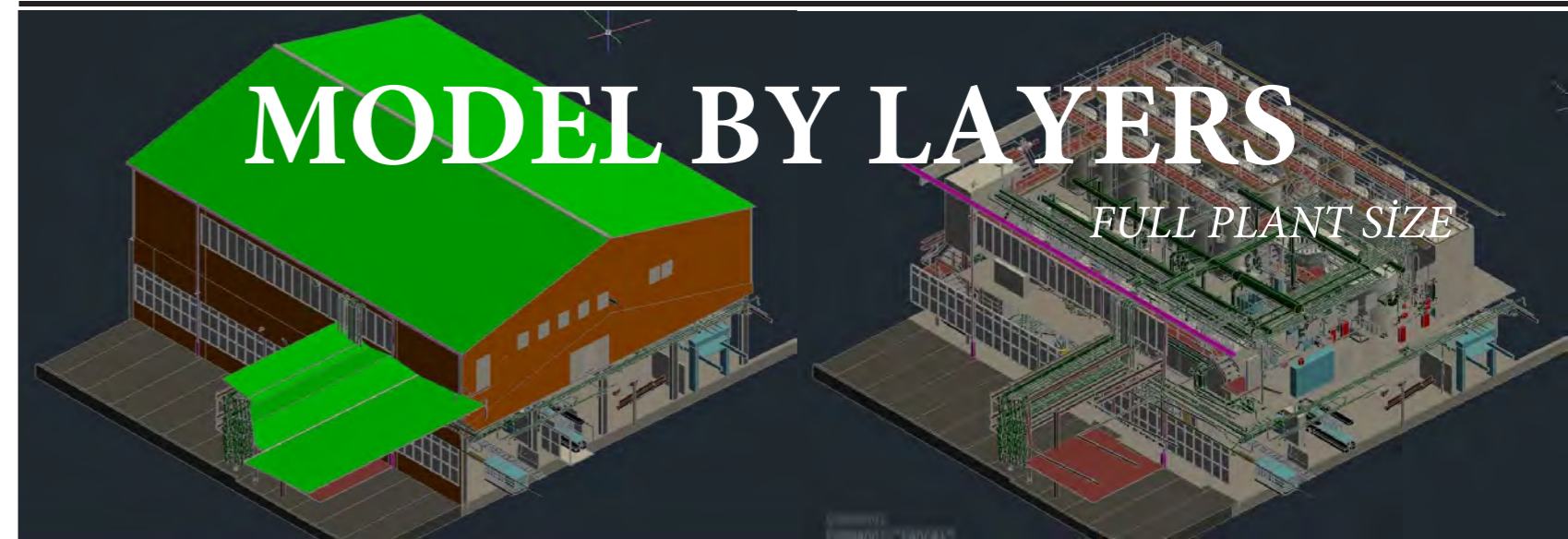
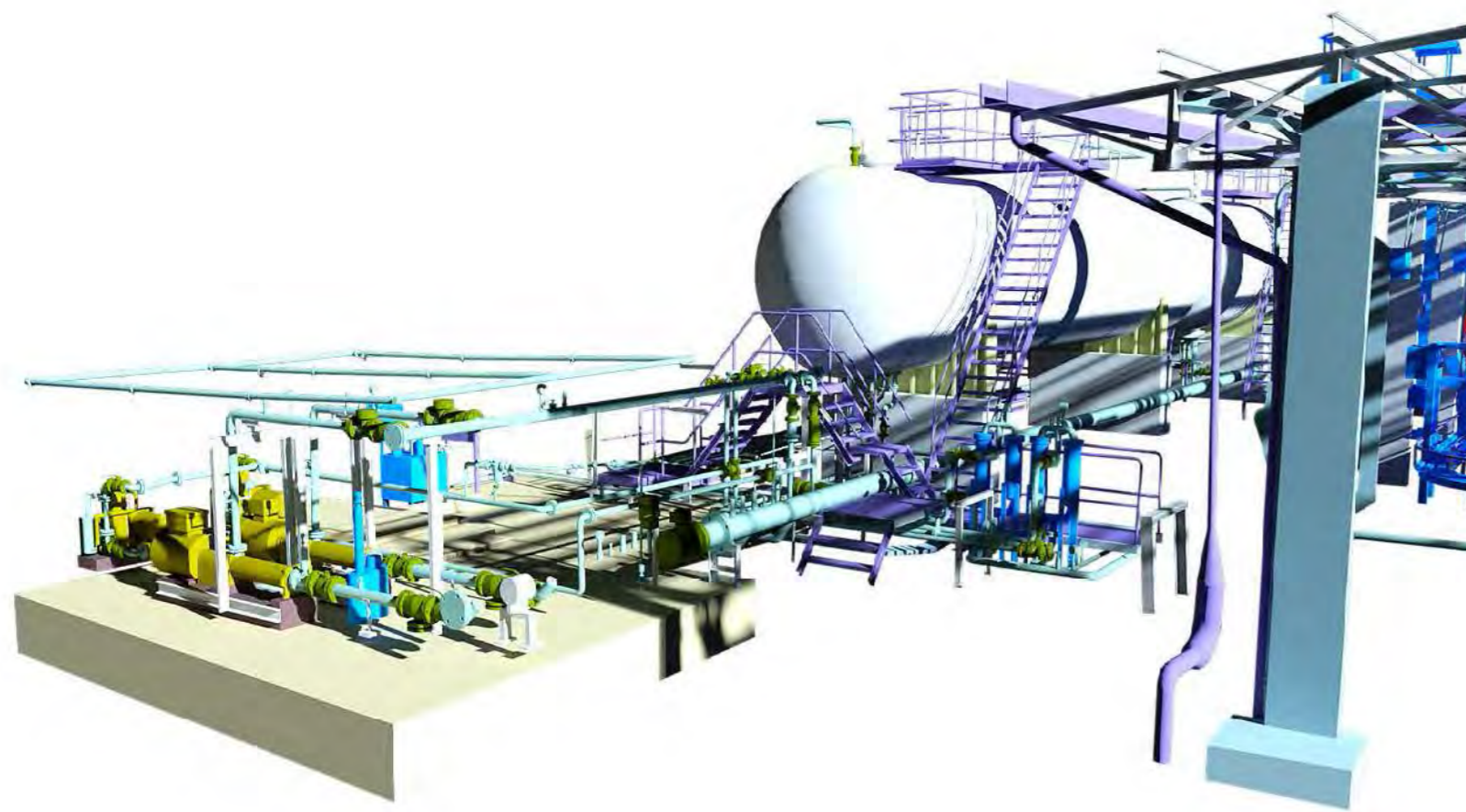


For measuring inside the tanks in petro chemical sector, it is always a big issue, as much time consuming because of work safety regulations and as well still very dangerous for the workers.

What we can do here, we can scan inside the tank without entering it. Our *reverse* working tripod, lets us scan inside the tank by using the top manhole and only scan head can be lowered down for precise scan.

Accessories are important during a scan project. Another tripod is for high places where we can't climb like sanctuaries with semi domes etc.. The same tripod is used for extended heights like up to 6 meters. It is bringing richness to data in projects for a roof without access or a tank without stairs etc. It must be carefully used because if there is wind, then this set up will not be used, because of waving effect.



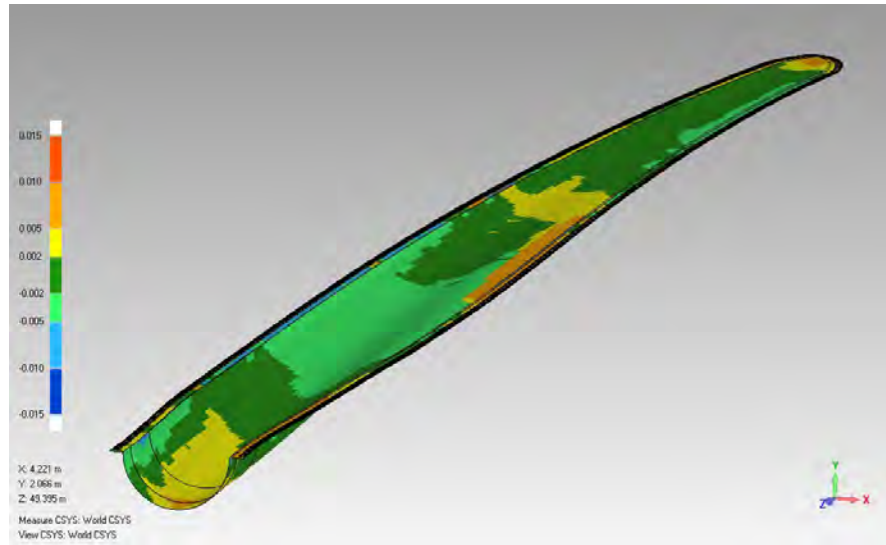


ENERGY

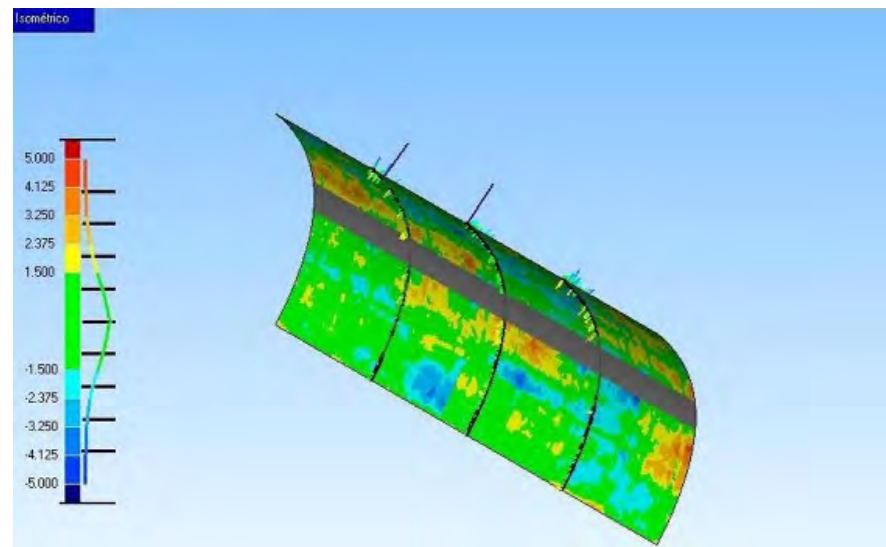
ONE FOR ALL

Sunay Akin

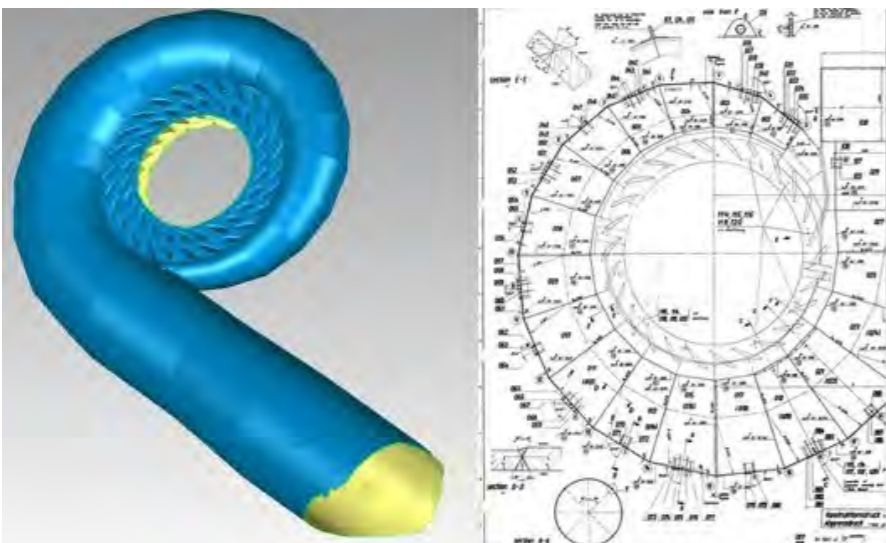
WIND ENERGY



SUN ENERGY



HYDROELECTRICITY



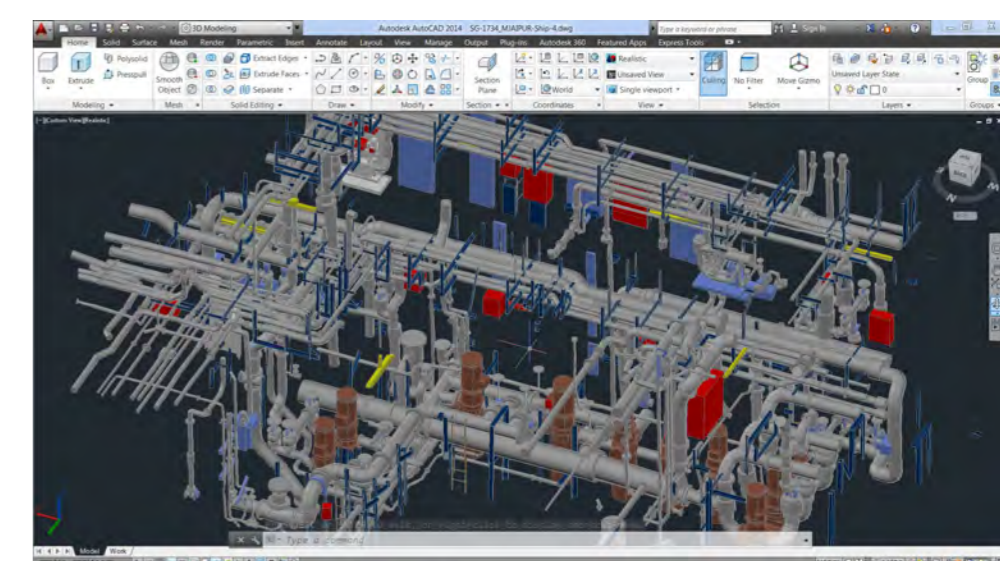
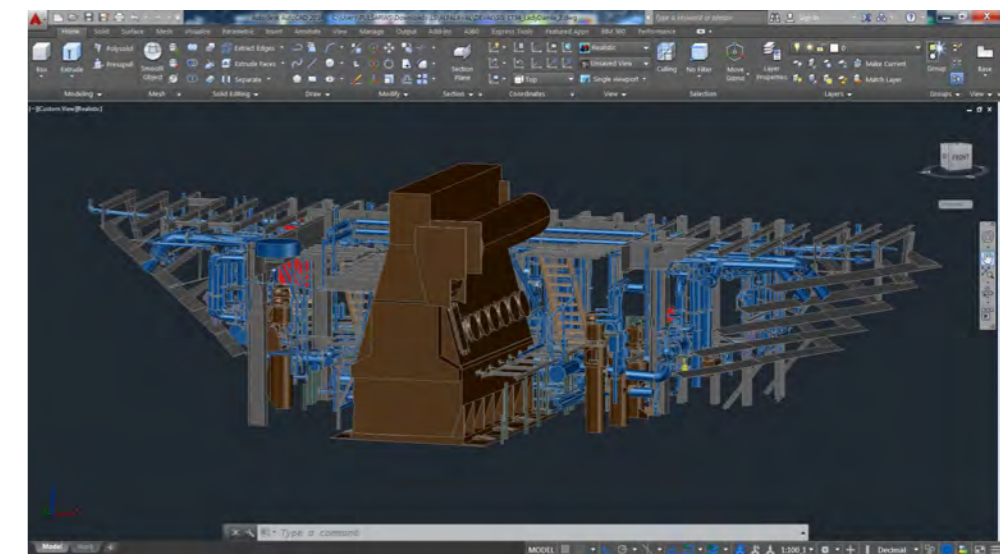
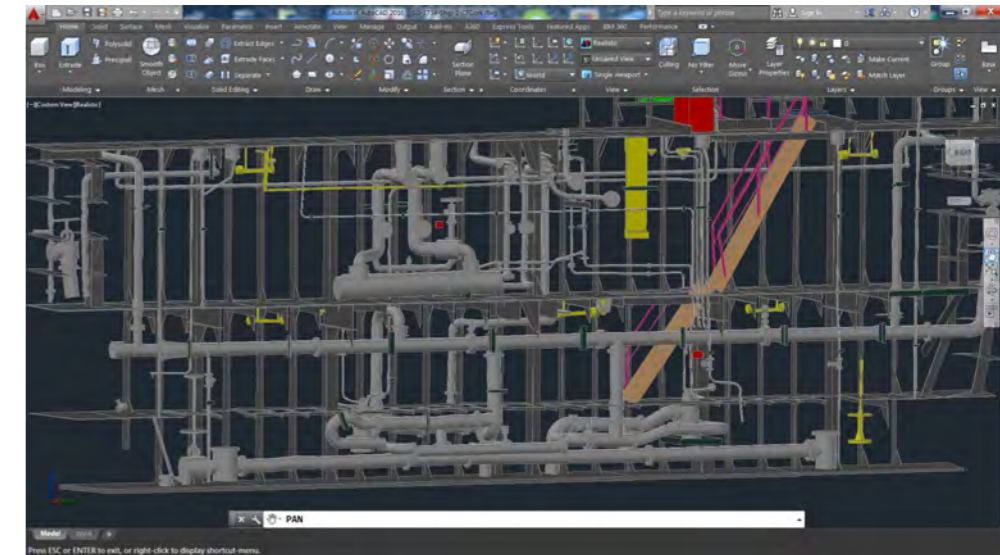
SHIPPING

FLOATING STRUCTURE

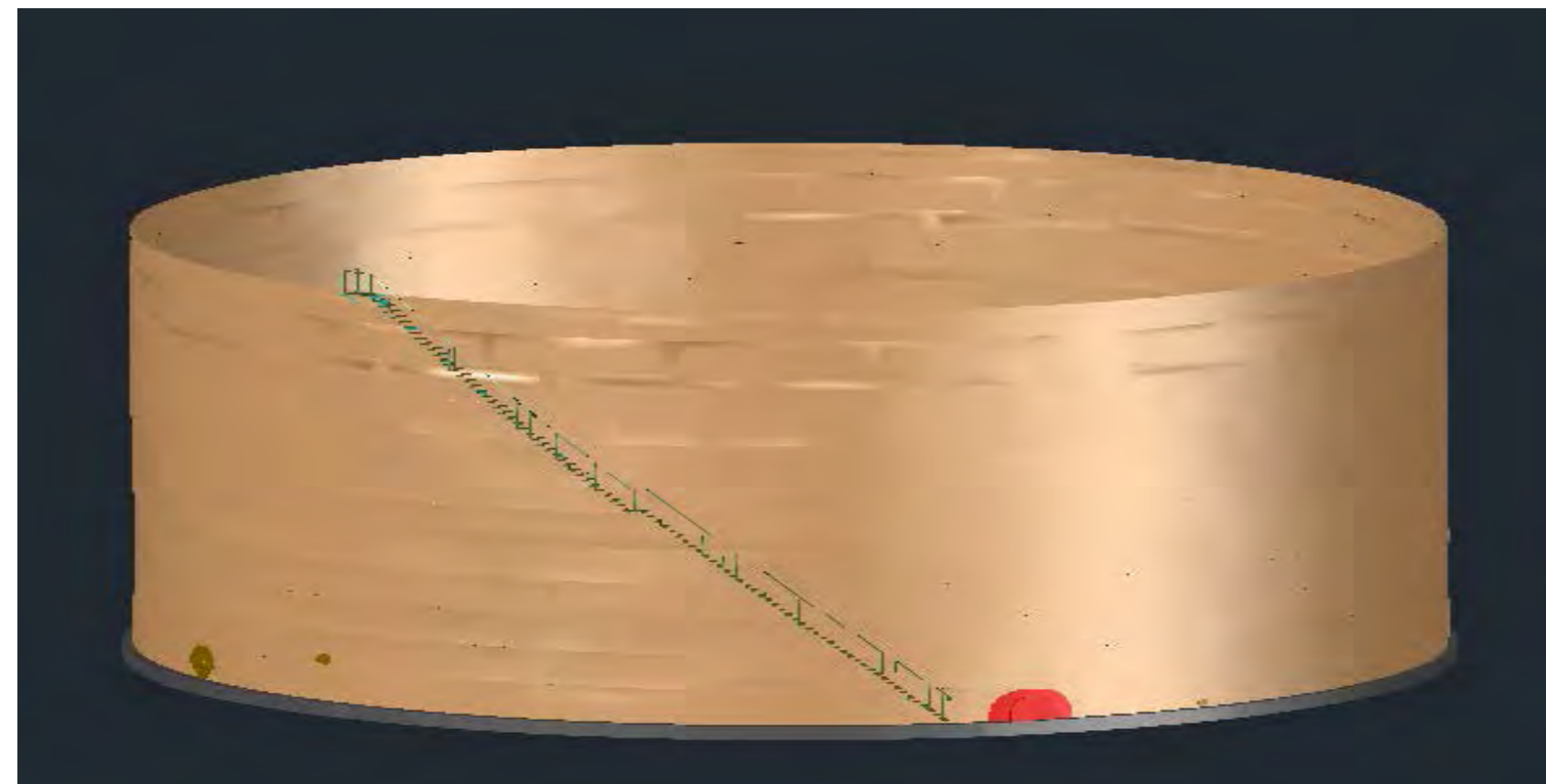
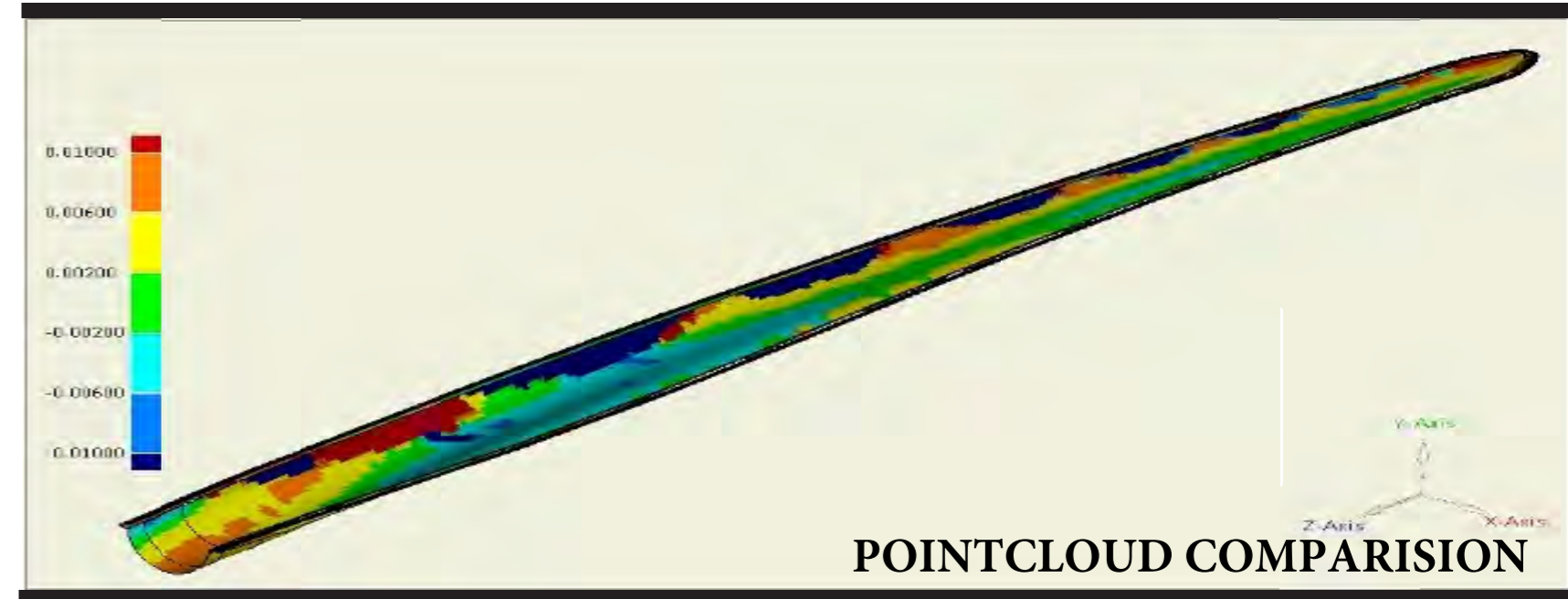
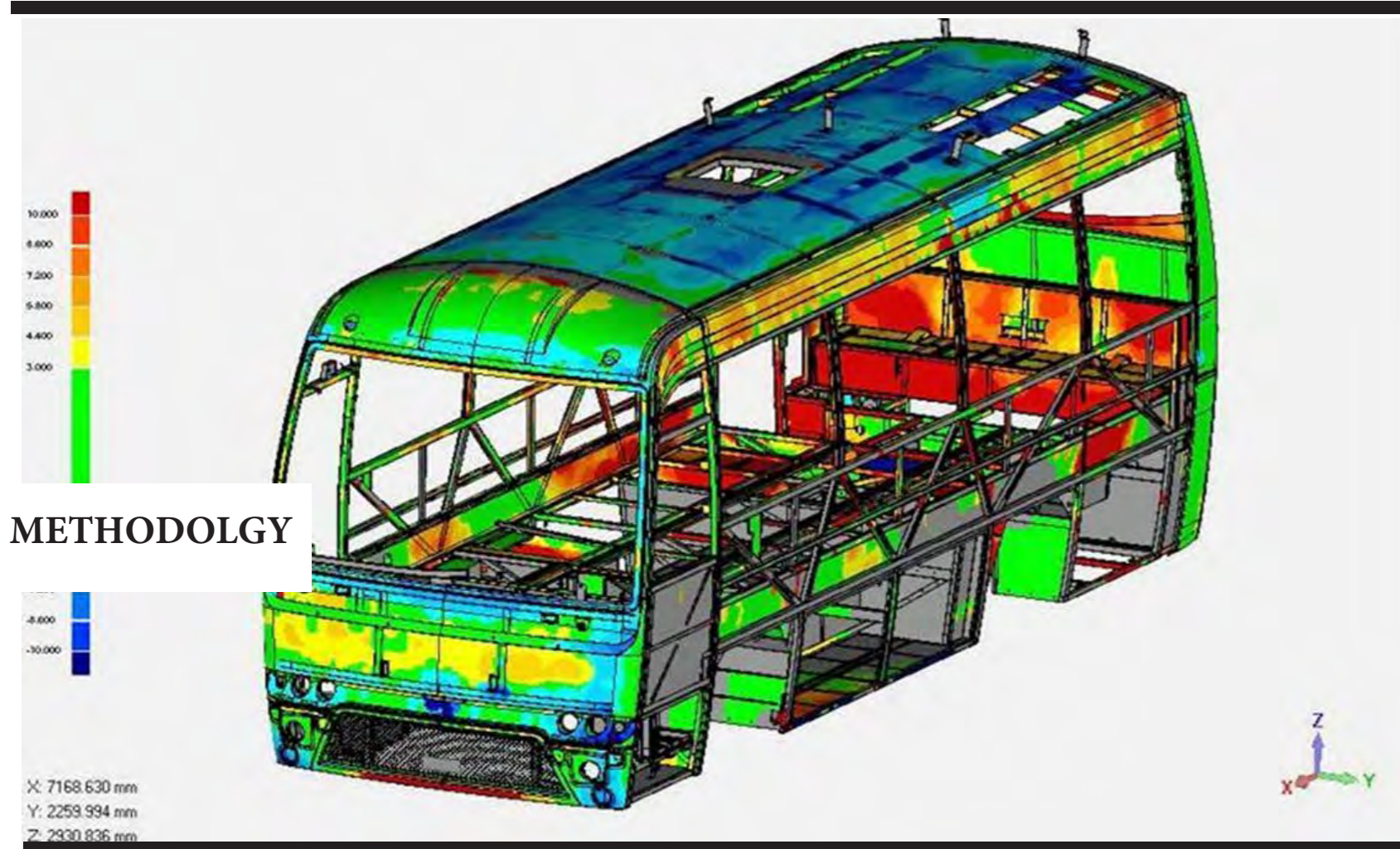
RETROFIT PROJECT

ENGINE ROOM

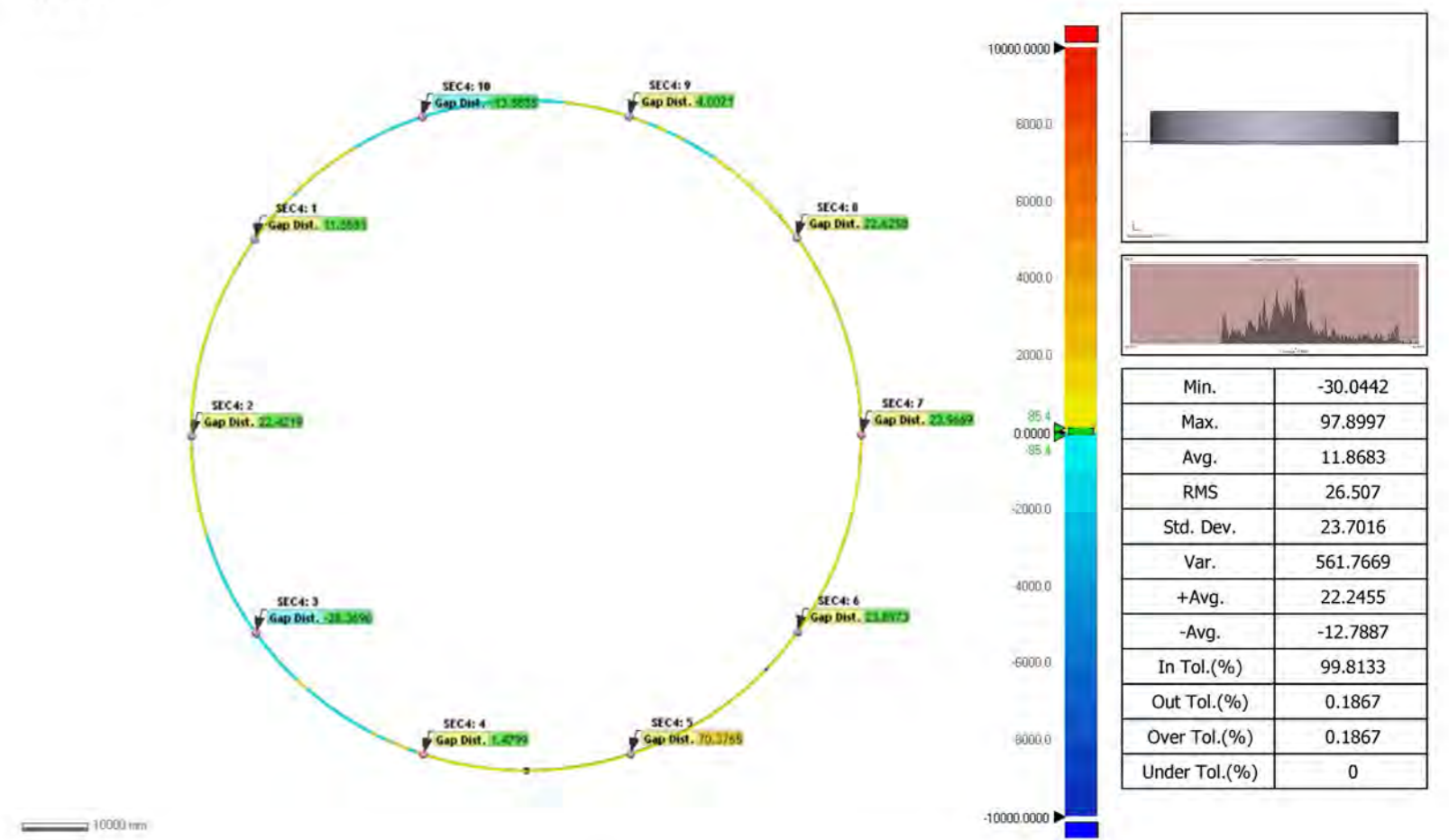
BALAST WATER TREATMENT SYSTEM



ANALYZES



SEC4



Product Name	BOTAŞ CEYHAN	Department	KALITE KONTROL	Date	Jul 21, 2016
Part Name	D602	Inspector	PULSAR MUHENDISLIK	Unit	mm



CHECKPOINT

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3D CHECKPOINT

FOR THOSE WHO WANT TO GET ADVANCED IN LIFE!

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