

3D Modelling and Detailing in Tekla Structures

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Abstract – In our project we center around 3D Modeling and Detailing in Tekla structures which involved these days in development industry for steel and cement both enumerating and furthermore precast and cast in-situ. These product offers upgrades, enhancements and new highlights to help efficiency and make smoother work processes. With improvements of drawing creation, steel cast - set up and precast concrete, underlying designing plan and cooperation. The most recent renditions of Tekla structures are generally expected to make the work more straightforward and quicker. Tekla structures utilized for configuration, enumerating and data the executives from applied wanting to manufacture and development on location.

Key Words: 3D Modelling, Tekla structures, BIM, AutoCAD, Steel detailing, Import, Quick Launch, Reinforcement, Master drawing catalog.

1. INTRODUCTION

Tekla structures is a structure data displaying programming ready to make model designs that integrate various types of building materials, including steel, cement, wood and glass. This product is utilized to make and oversee 3D primary models in cement and steel with dealing with the interaction from idea to creation. It contends in the BIM (Building Information Modelling) market with AutoCAD, Autodesk Revit, D profiler and advanced project, Lucas Bridge, Priced and others. Tekla structures is known to help enormous sort of models with various synchronous clients. This product utilized broadly for the steel plan of capital entryway (Abu Dabi) and UAE. Tekla won many honours for its substantial and steel projects. North American BIM Award for substantial task is one of them which is hydroelectric venture that has seen steel, concrete, and rebar completely point by point utilizing Tekla structures.

1.1 Overview

Tekla technology creates new opportunities for the disciplines in the construction industry. Tekla structures is the first intelligent 3D BIM (Building Information Modelling) software and the most advanced on the market that provides an accurate, Dynamic, and Data

rich 3D environment. Essentially, the Tekla model contains all the information required from conceptual designs, detailing, and manufacturing to construction of project in a single Environment. With Tekla software, your constructible designs will promote error-free fabrication and successful construction. Tekla models can deliver LOD 500 + highest level of development possible making models which make them truly constructible.

1.2 Future scope

These days numerous underlying steel structures are coming in India. One of the best examples for steel structures is Rajiv Gandhi international airport, a Hyderabad and for these structures Tekla is the top one option. Tekla is powerful structural BIM (Building Information Modeling) software for better future project. In the present market in India Tekla is useful as designing multistoried building structures and it does have its usage selectively. Tekla adopted the truly constructible BIM process and welcome a new age of reliable project information and Deliver the best work in less time. In present modern scenario Tekla becoming the most adopted and favorite software for steel detailing and fabrication by many other construction companies.

1.3 Objectives

1. To study the concept detailing in Tekla structures software.
2. To analyze and research on available study material related to Tekla structure software.
3. To study and learn actual detailing procedure in Tekla structure software.
4. Detailing a G+2 RCC structure and generating drawings in Tekla structures software.

2. METHODOLOGY

Tekla Structures is a structure data demonstrating programming ready to display structures that integrate various types of building materials, including steel, cement, lumber and glass. Tekla permits primary drafters and architects to plan a structure and its parts utilizing 3D demonstrating, create 2D drawings and access building data. Tekla Structures is utilized in the development business for steel and substantial enumerating, precast and cast in-situ. The product empowers clients to make and oversee 3D underlying models in cement or steel, and guides them through the interaction from idea to manufacture.

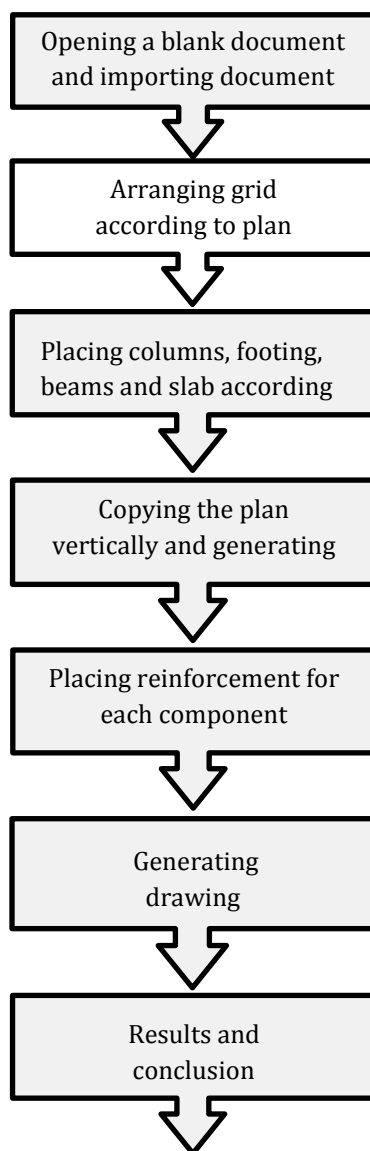


Fig :2.1 Flow Chart of methodology

2.1 Opening a blank document and importing a document

Clear venture is a Tekla Structures climate that incorporates just nonexclusive substance, like parametric profiles and unclear materials. Import models and drawings from Tekla structures in another model. Open the Tekla Structures model into which you need to import the other model. Go to Quick Launch, begin composing import model, and select the Import model order from the rundown that shows up. Select a model organizer to import and snap OK.

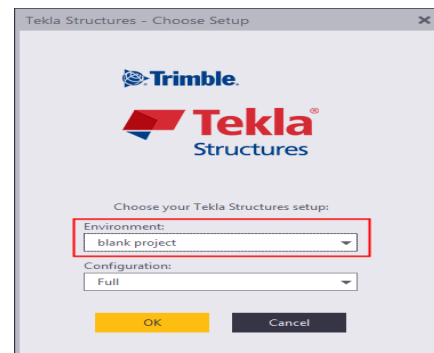


Fig :2.2 Pop-up window for blank project.

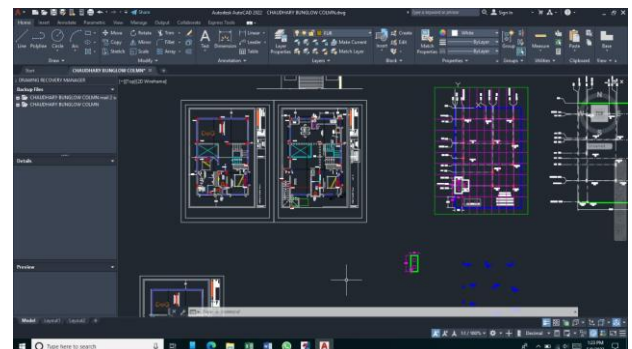


Fig :2.3 Finalizing the Auto cad plan.

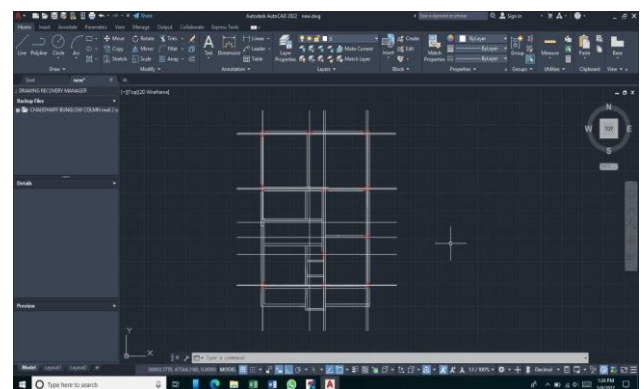


Fig :2.4 Import the plan

2.2 Arranging grid according to plan creating view.

You can show matrices and network line marks in single-part, cast unit, gathering, and general game plan drawings. You can set programmed lattice properties and furthermore physically adjust properties in an open drawing. Drawings might incorporate a few perspectives. Notwithstanding the perspectives Tekla Structures makes naturally founded on your determination at drawing creation.

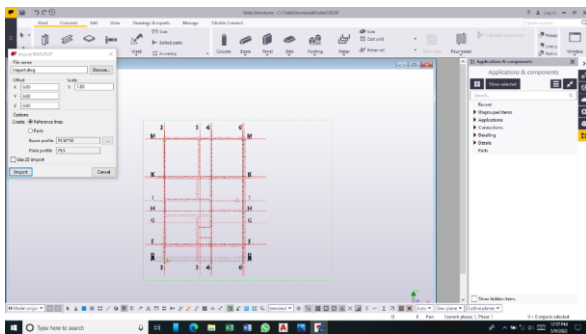


Fig :2.5 Editing the Grid lines

2.3 Placing columns, footings, beams and slab according to plan.

Tekla Structures includes the following components that you can use to automatically create reinforcement for beams, columns, and slabs the open drawing, and modify the existing ones.

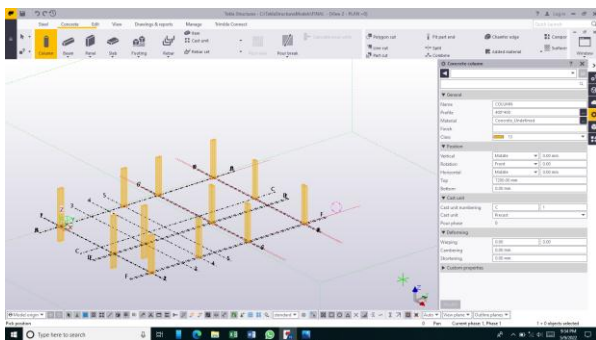


Fig :2.6 Placing the column.

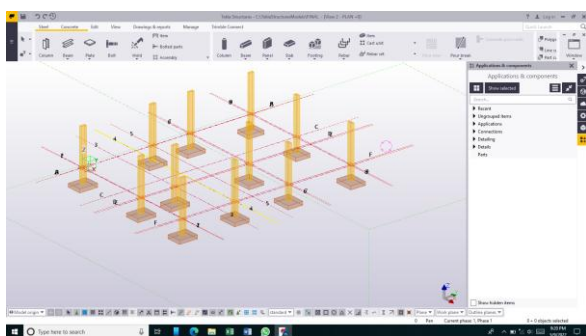


Fig :2.7 Placing Footing.

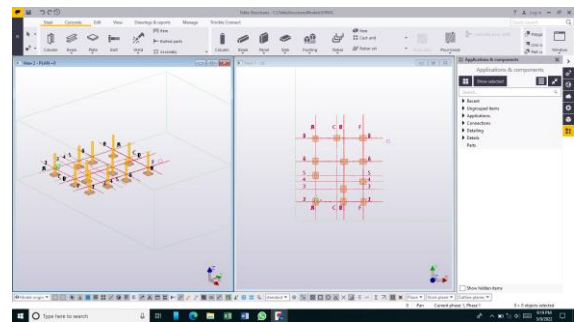


Fig :2.8 Footing in 2D and 3D View.

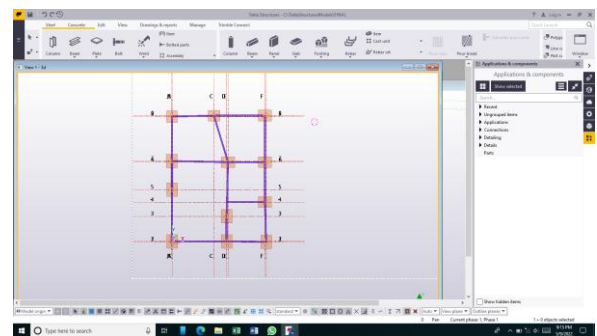


Fig :2.9 Placing Beams in 2D view.

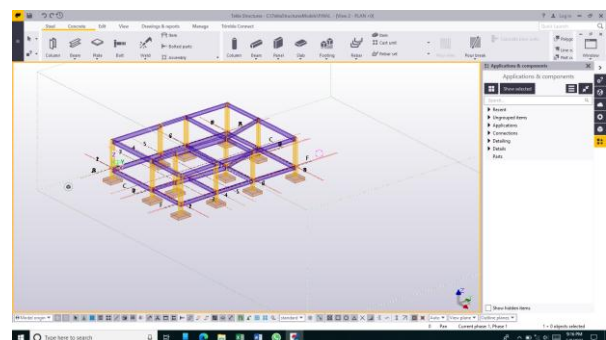


Fig :2.10 View of Beams

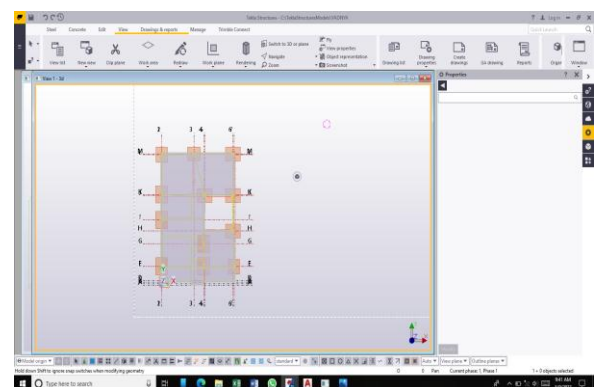


Fig :2.11 2D View of Slab

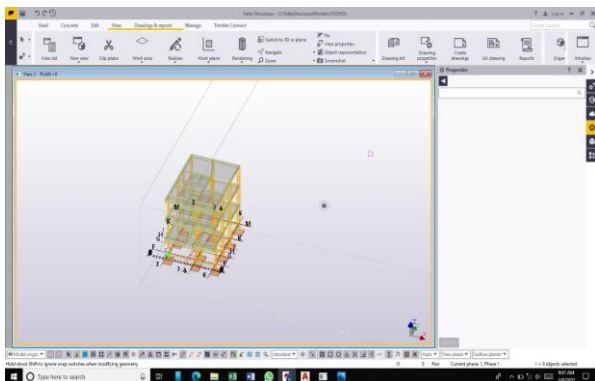


Fig :2.12 3D View of Floors

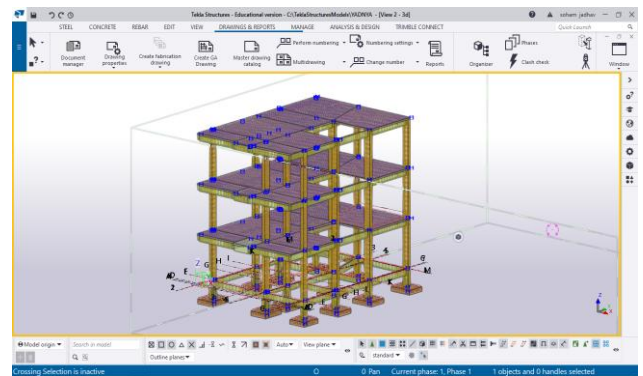


Fig :2.14 3D model of G+2 structure with detailing.

2.4 Placing the reinforcement for each component

At the point when you make a support, Tekla Structures consequently appends the support to the part for which you are making the support. If necessary, you can connect a support to a substantial part additionally physically. The connected supporting bars follow the part or cast unit when it is moved, replicated, or erased. Shaft support (63) makes support for a cement footer. Select the cement footer. The support is made consequently when you select the shaft. Bars made in Tekla. Section Reinforcement Tool makes support to unpredictably formed substantial pieces.

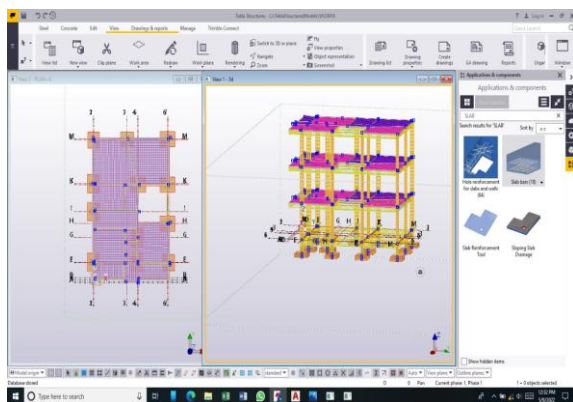


Fig :2.13 Reinforcement in 3D and 2D view

2.5 Generating drawing

Create drawings using the various master drawing types in the Master Drawing Catalog. Using rule sets is a highly automated process of creating several drawings of different type in one go.

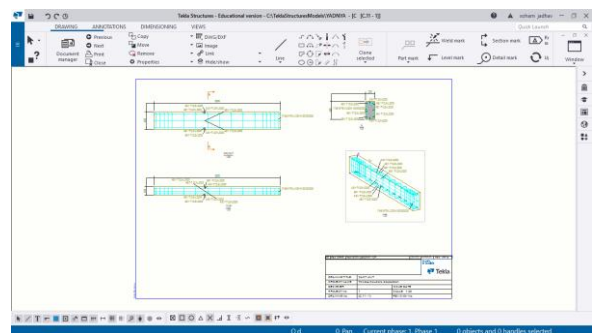


Fig :2.15 Column 1 Fabrication Drawing.

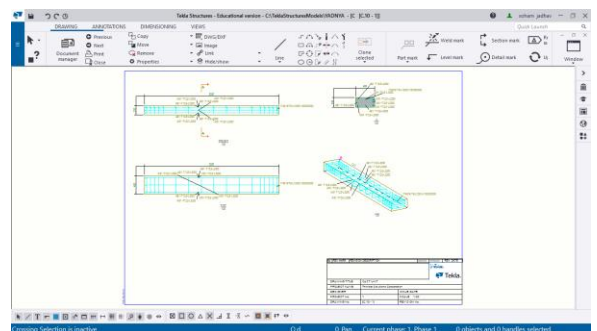


Fig :2.16 Column 2 Fabrication Drawing.

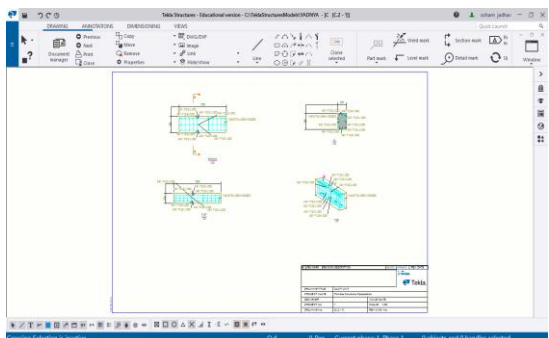


Fig :2.17 Column 3 Fabrication Drawing.

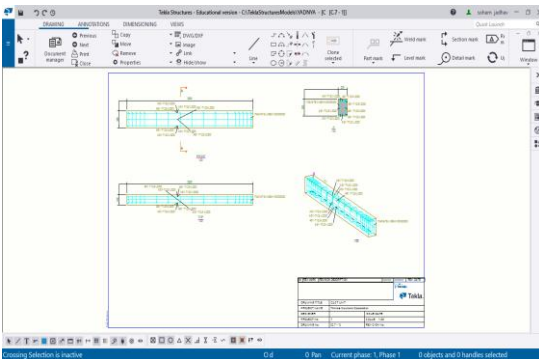


Fig :2.18 Column 4 Fabrication drawing.

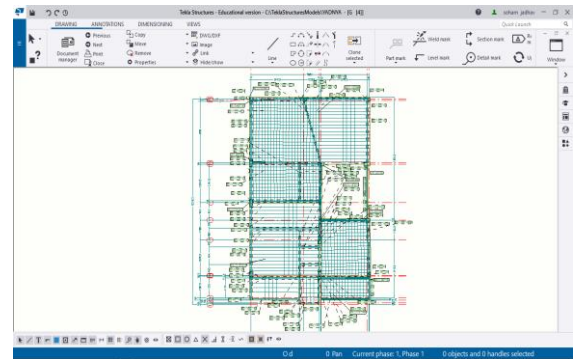


Fig :2.22 GA Drawing 2

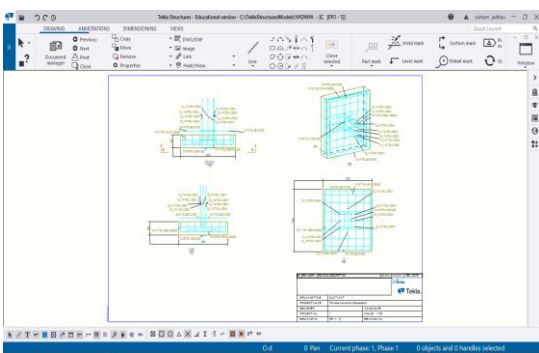


Fig :2.19 Footing 1 Fabrication Drawing.

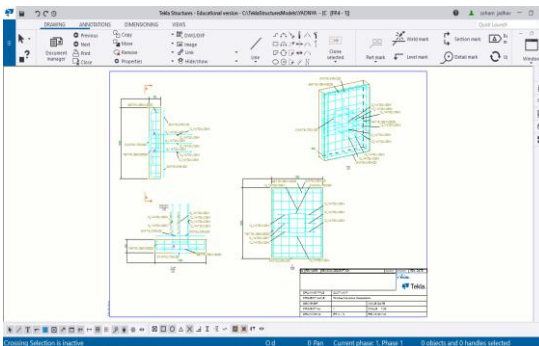


Fig :2.20 Footing 2 Fabrication Drawing.

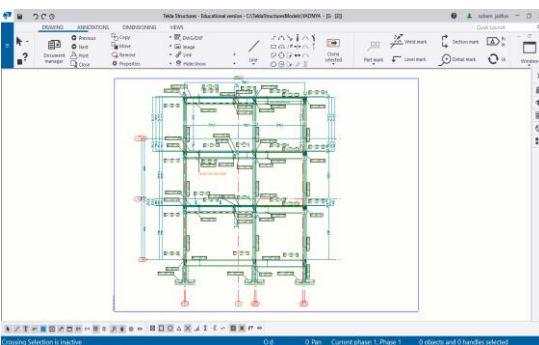


Fig :2.21 GA Drawing 1

Engineers have utilized Tekla Structures to demonstrate arenas, seaward designs, pipe rack structures, plants, production lines, private structures, scaffolds and high rises. Tekla Structures was utilized in the development plan for different undertakings all over the planet, including:

1. Show off Replacement, Daytona International Speedway (USA)
2. Frontstretch Grandstands, Daytona International Speedway (USA)
3. Denver International Airport Expansion (USA)
4. San Jose Earthquakes Stadium (USA)
5. BB&T Ballpark (Charlotte, USA)
6. Spillway Replacement, Manitoba Hydro (USA)
7. Public Stadium Roof, Singapore Sports Hub (Singapore)
8. Red Bear Student Center (Canada)
9. Troja Bridge (Prague)
10. Tesco Supermarket (Sheringham, UK)
11. Baylor University Stadium (Australia)
12. Sutter Medical Center (California, USA)
13. Development, Chennai International Airport (India)
14. Dongdaemun Design Plaza (Seoul)
15. Capital Gate (Abu Dhabi)
16. Lord Abdullah Financial District (Saudi Arabia)
17. Lord Abdulaziz Center for World Culture (Saudi Arabia)
18. Public Museum of Qatar (Qatar)
19. Hilton Garden Inn (UAE)
20. Puuvilla Shopping Center (Finland)

3. CONCLUSIONS

Tekla structures is a vast product that covers the entire structural designs process in a single environment. It enables a single BIM model to be used from the conceptual stages right through to fabrication and beyond its ability to reuse data through design, analysis and detailing phases and model in steel, concrete and timber is somewhat unique in the industry. In terms of modeling this software is extremely powerful. This software does an excellent job of bridging the gap between design and fabrication and through its single environment provides the perfect conduit for data to flow smoothly from engineer to detailer. Most importantly, through it has been potential to simplify the management of an often-fragmented process, leading to enhanced collaboration, better designs, reduce times, and of course the lower cost.

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