

CAPABILITY DOCUMENT

**CAPABILITY DOCUMENT
AND COMPANY PROFILE
MARCH 2024**



CAPABILITY DOCUMENT AND COMPANY PROFILE

EXECUTIVE SUMMARY

Safe Consultants and its team is committed to adhere to ensuring following:

- Quality of Services
- Environment
- Ethics
- Health and Safety
- Customer care
- Knowledge sharing & Research Management

Our mission statement is to **PERFORM**, and that covers above policies. **PERFORM** is abbreviation of

P – Providing Engineering Solution

E – Ethical Business

R – Research Management & Knowledge Sharing (KSRM)

F – Following Sustainable Footprints

O – Observing Quality Assurance

R – Responsible Approach

M – Mission Client Satisfaction

Our commitment, awareness and approach towards each policies sensitively, helps us to achieve our mission. We continually research and analyze, innovate and recreate, best practices & future trends and use this knowledge to inform and inspire our designs, and in turn our services.

It is duty of each individual of Safe Consultant's team to follow these policies, defined in this document, but not limited to, for achieving our vision.

Our Vision

“Providing comprehensive solutions engineered with innovative and futuristic approach to exceed client satisfaction.”

ABOUT FOUNDER



Er. Jigar Rana

Founder and Director

Safe Consultants was founded by **Er. Jigar Rana** in 2006. He has evolved all through his professional career of 17+ years, to become a profound engineering professional with a great intuition and vision for the engineering he deals with.

During his journey as an Engineering Professional, he has worked for various projects and has got immense appreciation for his contribution and value engineering from the project team and Clients. His dynamic and proactive approach makes him the important part of Project team.

His domain versatility is justified by his profile which showcases projects in areas like power plant sector, water supply sector, Oil and Gas Sector, Water treatment and Effluent treatment sectors, Industrial structures – Plant and Non-plant facilities, refurbishment assignments, Building Information Modelling and Sustainability, and research & development works. Adopting and implementing BIM, introducing Sustainability aspect in Structural Engineering design and at Project level, use of latest Technology and software framework are the key aspects of his vision which makes him an exciting team and project leader.

He has lead in projects like Kevadiya Railway Station, India's First Rail University "National Rail and Transportation Institute", one of the largest Bird Aviary at Sayajibaug, Design of Shake table and 10 working models for an Earthquake Laboratory at LD. College of Engineering, Masterplanning of Multi-model Integrated planning at Vadodara for National high Speed Rail Corporation Limited as his key portfolio.

He has also guided 3 Research scholars of Post graduation thesis and pursuing Ph. D in Civil Engineering.

OUR SERVICES



- **INFRASTRUCTURE DESIGN**
- **BIM AND 3D MODELLING** – ARCHITECTURE, STRUCTURE, MEP
- **REFURBISHMENT** – RETROFITTING & RESTORATION
- **BUILDING DESIGN** – RESIDENTIAL & COMMERCIAL
- **DESIGNING HOME** – ARCHITECTURE & INTERIOR

 <p>Designing Home</p>	<ul style="list-style-type: none"> ➤ Architectural planning and Interior design ➤ Climate responsive design ➤ Landscaping ➤ Elevation treatment and façade design ➤ Design of masonry & composite structures ➤ Green Building design
 <p>Building Design</p>	<ul style="list-style-type: none"> ➤ Analysis & design of Concrete & Steel structures ➤ Geotechnical investigation & Foundation design ➤ Seismic Evaluation and Retrofitting measures ➤ Damage assessment & Refurbishment measures ➤ Building Information Modelling (<i>BIM</i>) ➤ Bar Bending Schedules, Estimations, Fabrication
 <p>Infrastructure Design</p>	<ul style="list-style-type: none"> ➤ Civil & Structural Engineering ➤ Industrial steel structure designs ➤ Machine foundation ➤ Bridge Engineering ➤ Water retaining & containing structures ➤ Geotechnical, Embankment & Foundation design
 <p>BIM and 3D Modelling</p>	<ul style="list-style-type: none"> ➤ 3D analytical model in Staad, ETABS, SAP & ROBOT ➤ Revit Architectural, Structural & MEP modelling ➤ BIM 3D, 4D, 5D modelling, As-built modelling ➤ Preparation of Erection and Fabrication model ➤ Preparation of Conceptual Model for overall plant ➤ Site planning & design using Infracore, Civil 3D
 <p>Refurbishment</p>	<ul style="list-style-type: none"> ➤ Renovation, restoration & refurbishment ➤ Strengthening of Existing structures ➤ Failure analysis & Retrofitting measures ➤ Vibration testing of structures ➤ Non-Destructive Testing ➤ Conditional Assessment and Visual Screening

OUR EXPERIENCE



- Building Design
- Water Sector
- Geotechnical Engineering
- Stress Analysis
- Bridge Engineering
- Industrial Design
- Refurbishment and Rehabilitation
- Sustainability
- Building Information Modelling (BIM)
- Architectural Design and Interior design

Environment, Social Governance (ESG) Consultation is also one of our key services that we are willing to look into.

PROJECTS EXPERIENCE

YEAR 2023
LOCATION: KEDARNATH

PROJECT: AUM SCULPTURE – KEDARNATH RESTORATION & REDEVELOPMENT PROJECT
CLIENT: INFINE ART LLP



ACTUAL PHOTOGRAPH OF COMPLETED SCULPTURE INSTALLATION

MAIN PROJECT FEATURES

- Project scope covers Structure design of Aum Sculpture, fabrication drawings and installation & transportation scheme
- The overall structure design was done using Staad pro software & its fabrication was done using 3D BIM using Revit
- Total size of Sculpture is 5m wide and 5 m height and it was weighing 5 Mton.
- The internal frame material was Stainless steel and façade skin was brass.



YEAR 2021
LOCATION: KEVADIYA

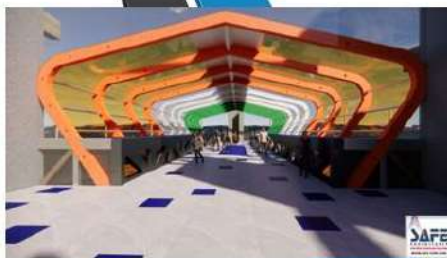
PROJECT: RAILWAY STATION AT KEVADIYA, GUJARAT
CLIENT: WESTERN RAILWAY, VADODARA DIVISION



RENDERED PHOTOGRAPH OF COMPLETED BUILDING AND CIRCULATING AREA

MAIN PROJECT FEATURES

- Project scope covers Architecture, Structure and Circulating area design including Horticulture and master planning
- Space truss design of Roof covering both platforms about 3500 sqm area and 550 Mton Structural steel.
- Received Provisional Platinum rating certification from Indian Green Building Council



YEAR 2022
LOCATION: UJJAIN, M.P

PROJECT: CULTURAL IMPORTANCE COMMERCIAL BUILDING "AVANTIKA" AT
UJJAIN RAILWAY STATION
CLIENT: BUILDWELL ENGINEERS AND WESTERN RAILWAY



ACTUAL PHOTOGRAPH OF COMPLETED BUILDING AND CIRCULATING AREA

MAIN PROJECT FEATURES

- Soil investigation
- Architectural Design and planning
- Circulating area Design with Hardscape, Landscape and Fountain design
- Preparation of working drawings – Architectural and Structural
- Approval from Railway Authority
- Fountain represents the Shivalinga and Building façade replicates existing Station building and Temple resemblance



INDIA'S FIRST RAIL AND TRANSPORTATION UNIVERSITY



Actual
Photo



Rendered
Photo



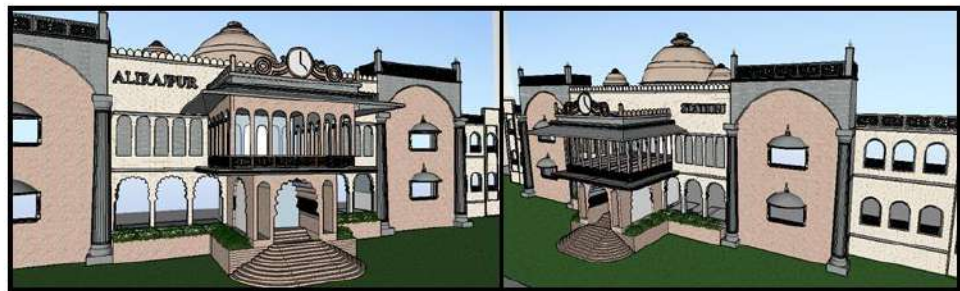
- Refurbishment of existing structure for Façade Uplifting and Vertical Extension.
- Design and Construction time was limited to 2 Months and the same was achieved using Structural Steel framework.
- Use of Building Information Modelling for Coordination and Decision was adopted.
- Project was given recognition by Ministry of Railways for Best Executed project in Civil Engineering 2018.

YEAR 2016
LOCATION: ALIRAJPUR, MP

PROJECT: ALIRAJPUR RAILWAY STATION
CLIENT: WESTERN RAILWAY, VADODARA DIVISION



3D BIM SKETCHUP MODEL



MAIN PROJECT FEATURES

- Architectural and Façade design
- Landscape design for Circulating area of Station building
- Storm water drain design for circulating area
- Master planning of Railway station, Railway colony and circulating area
- 3D BIM model prepared in Autodesk Revit
- Storm water drain design using Civil 3D

YEAR 2018
LOCATION: Dholera, Gujarat

PROJECT: WTP AND CLEAR WATER RESERVOIR AT TP1 AND MASTER
BALANCING RESERVOIR IN TP2E IN DHOLERA SPECIAL INVESTMENT REGION
CLIENT: SPML INFRA LIMITED



ACTUAL PHOTOGRAPH

MAIN PROJECT FEATURES

- Performed Structural designs for all components of WTP and MBR including pumping station and clear water reservoir
- Foundation design using pile foundation
- Scope also included preparation of various Building Information Modelling models for overall project components
 - The level of detailing for model preparation was LOD 350
 - Use of BIM was done using Autodesk Framework
 - Proof checking of designs by STUP Consultants
 - Project Management Consultant: AECOM

YEAR 2017
LOCATION: VADODARA

PROJECT: WIDENING OF EXISTING ROAD OVER-BRIDGE AT KM 397-397A ON AHMEDABAD-MUMBAI BROAD GAUGE RAILWAY LINE AT VADODARA
CLIENT: WESTERN RAILWAY – CONSTRUCTION DEPARTMENT.



ACTUAL SITE PHOTOGRAPHS OF ROB EXTENSION

MAIN PROJECT FEATURES

- Soil investigation
- Foundation design – Pile foundation in constrained area
- Super structure design – Pier and pier cap as per Limit state method IRC code.
- Non-Standard RDSO span design as per limit state method IRC code
- Preparation of working drawings for foundation, pier, pier cap and non-standard RDSO span

YEAR 2017
LOCATION: ANKLESHWAR

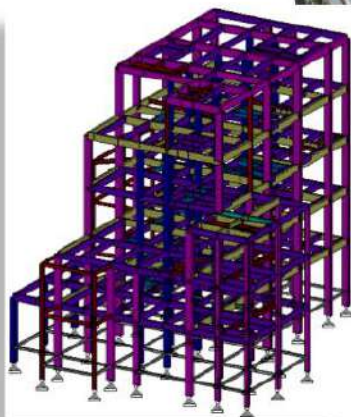
PROJECT: STRUCTURAL ASSESSMENT OF S3 PLANT AND S2
PLANT STRUCTURE
OUR CLIENT: SONGWON SPECIALTY CHEMICALS INDIA PVT. LTD.



REBOUND HAMMER TEST



UPV TEST



STAAD ANALYTICAL MODEL OF S3 PLANT



CORE CUTTING TEST

MAIN PROJECT FEATURES

- Non-destructive testing of S3 and S2 plant
- To perform visual assessment and capture existing layout
- To perform condition assessment based on NDT result
- Provide structural stability
- To prepare 3D analytical model

YEAR 2016
LOCATION: NADIAD

PROJECT: RAIL OVER BRIDGE AT LC 269 AT NADIAD
CLIENT: WESTERN RAILWAY – CONSTRUCTION DEPARTMENT



MAIN PROJECT FEATURES

- Soil investigation, Foundation design and super structure design as per LSM IRC
- 3D BIM model was prepared in Revit model for bridge structure.
- Bridge model was located at actual site using Infracore

YEAR 2019
LOCATION: VADODARA

PROJECT: REDEVELOPMENT OF ZOO – BIRD'S AVIARY AT SAYAJIBAUG, VADODARA



MAIN PROJECT FEATURES

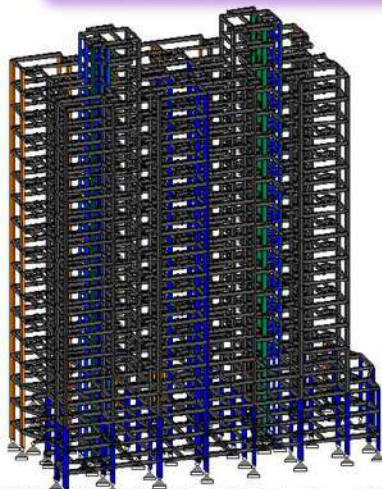
- To perform Structural Analysis and design of Bird's Aviary Structure
- To prepare Good For Construction drawings
- To perform Civil Foundation design



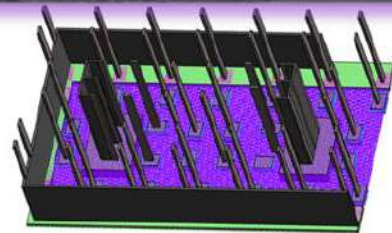
YEAR 2018
LOCATION: VADODARA

PROJECT: HIGHRISE LOW COST RESIDENTIAL PROJECT
CLIENT: ATMIYA GROUP, VADODARA

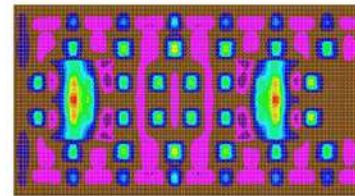
ACTUAL SITE PHOTO



ANALYTICAL MODEL - BUILDING AND RAFT IN STAAD PRO v8i



CONSTRUCTION MODEL - REVIT



MAIN PROJECT FEATURES

- To perform Structural Analysis and design of 2 Basement + Ground + 13 high rise structure
- By providing Raft against combined footing, 200 m³ of Concrete and 30 Mton of Steel was saved making it a ***Sustainable project.***
- Design Proof Checking was done by ***Narendra Patel & Associates.***

YEAR 2023
LOCATION: VATRA, GUJARAT

PROJECT: INDUSTRIAL FACILITY FOR TEXTILE INDUSTRY AT VATRA,
GUJARAT
CLIENT: CAMBAY INDIA LIMITED



ACTUAL PHOTOGRAPH

MAIN PROJECT FEATURES

- Architecture, Structure, Interior and Master planning
- Structural Designs for Main Plant using Tubular Steel Structure and Mezzanine Deck Slab system
- Use of Glass Fibre Reinforced Polymers in lieu of Mild Steel Reinforcement in Grade Slab, Circulating roads, Deck slab
- Overall project value 10 crore Indian Rupees

YEAR 2016
LOCATION: DEWAS, MP

PROJECT: 22 MLD STP AT DEWAS FOR MUNICIPAL CORPORATION
CLIENT: RADICAL ENGINEERING



3D BIM NAVISWORKS MODEL OF OVERALL STP SITE

MAIN PROJECT FEATURES

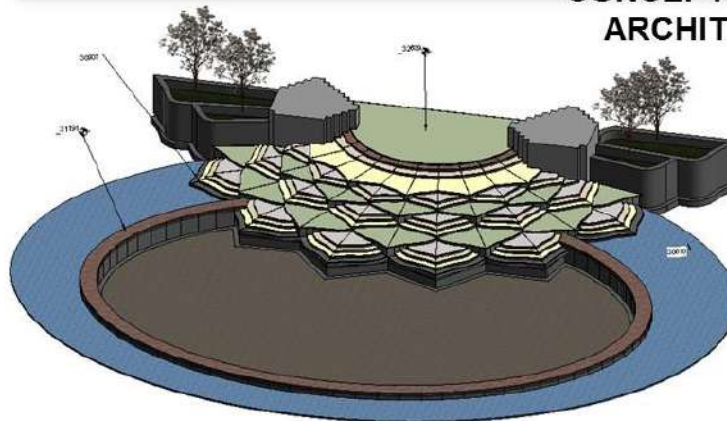
- To prepare 3D BIM Revit Structure model for various components of STP
- To create 3D structure model with reinforcement
- To integrate & check Clash detection for various model & components
- To prepare overall site along with civil and piping component in Navisworks
- To prepare Bill of material for concrete & steel of civil components

YEAR 2018
LOCATION: TAMPA, FLORIDA

PROJECT: ROTUNDA STRUCTURE FOR SKP ESTATE
MAIN CLIENT: SYNERGY BUILD & CAST LLP
OUR CLIENT: SHIV AUM CONSULTANTS



CONCEPTUAL IMAGE -
ARCHITECTURAL



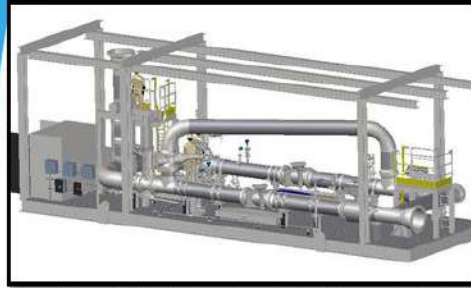
3D BIM MODEL - ARCHITECTURAL

MAIN PROJECT FEATURES

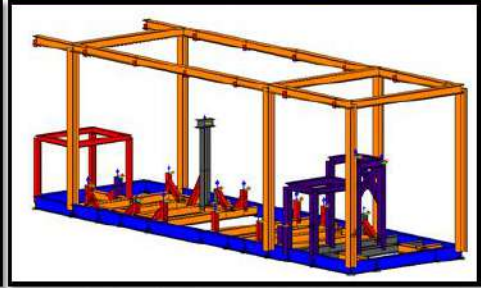
- Analysis and design Infinity Fountain structure, pool and Lotus step structure as per **ACI** and **Florida Building Code**
- Preparation of 3D BIM model for fabrication of Stone finishes and Precast concrete steps
- Preparation of 3D BIM model for HARDSCAPE including Architectural, Structure and MEP
- Execution model to be prepared in Navisworks

YEAR 2015
LOCATION: NETHERLAND

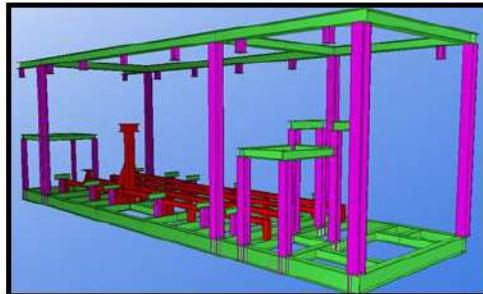
**PROJECT: OIL AND GAS METERING SKID FOR FPSO
CLIENT: NON-DISCLOSURE AGREEMENT**



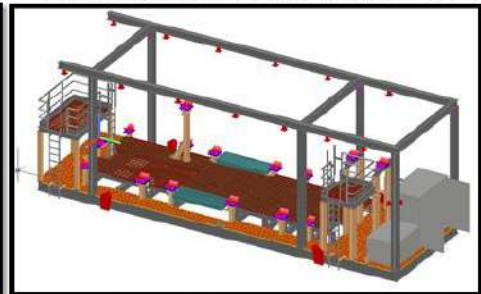
CAD WORKS INPUT MODEL



STAAD ANALYTICAL MODEL



3D BIM FABRICATION MODEL



OUTPUT IN CADWORKS



ACTUAL IMAGE OF SKID



LIFTING OF SKID - ACTUAL

MAIN PROJECT FEATURES

- Analysis & design of Oil & Gas metering skid as per project specs and DNV standards
- Lifting analysis, blast analysis, Vessel acceleration and Fatigue analysis
- Inventor, Navisworks, Staad, Tekla, Cad works were used for this complete 3D BIM integration project

YEAR 2017
LOCATION: ANAND, NADIAD

PROJECT: 4 NOS. 4 LANE ROAD OVER BRIDGE DESIGN FOR WESTERN RAILWAY, CONSTRUCTION DEPARTMENT - VADODARA SECTION



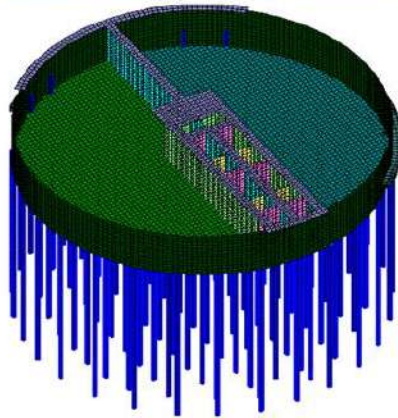
BRIDGE 3D MODEL INSERTED AT ACTUAL SITE LOCATION IN INFRAWORKS

MAIN PROJECT FEATURES

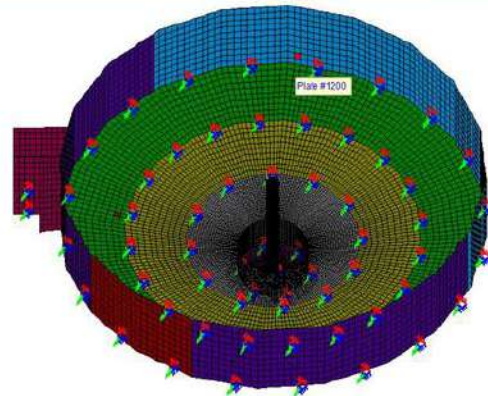
- Soil investigation
- Foundation design as per latest IRC code
- Use of RDSO Standards for substructure and pier design
- Preparation of working drawings and Bar bending schedule
- Approval from Railway Authority

YEAR 2015
LOCATION: CHENNAI

PROJECT: WATER TREATMENT PACKAGE FOR DM & ETP, CPCL
MAIN CLIENT: CHENNAI PETROLEUM CORPORATION LIMITED
OUR CLIENT: PARAMOUNT LIMITED
PROOF CONSULTANT: JACOBS ENGINEERING, MUMBAI



ANALYTICAL MODEL OF SEQUENTIAL BATCH REACTOR



ANALYTICAL MODEL OF HIGH RATE SOLID CLARIFIER

MAIN PROJECT FEATURES

- Structural design of various components of DM & ETP units in Staad Pro as per IS 3370 LSM
- Preparation of Design document for approval
- Preparation of Pile layout and Foundation design as piled Raft
- Preparation of Working drawings for various components

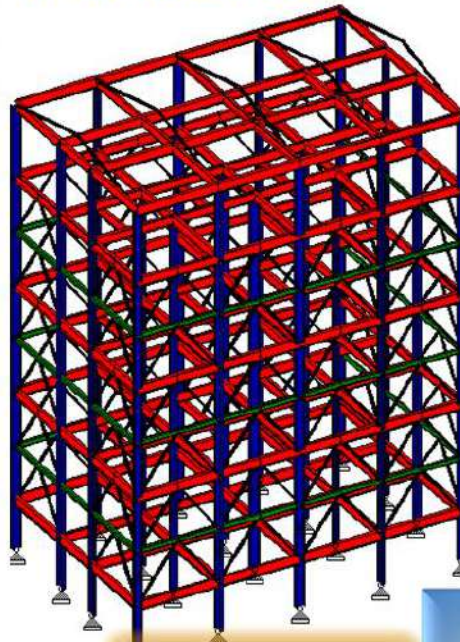
COMPONENTS OF DM PLANT
UF PERMEATE TANK
DEGASER TANK
RO PERMEATE TANK
DESAL WATER TANK
RO REJECT TANK
FILTER WATER/ BACK WASH TANK
DEGASER TOWER
RO PRODUCT WATER STORAGE TANK
DM WATER BUFFER TANK
EFFLUENT COLLECTIN TANK

COMPONENTS OF ETP PLANT
PROCESS EFFLUENT COLLECTION TANK
FLASH MIXER & FLOCCULATION TANK
DISSOLVED AIR FLOATATION TANK
SEQUENTIAL BIO REACTORS
SBR TREATED WATER SUMP
BIOLOGICAL TREATED EFFLUENT COLLECTION TANKS
HIGH RATE SOLID CONTACT CLARIFIER
UTILITIES EFFLUENT COLLECTION TANK
HIGH RATE SOLID CONTACT CLARIFIER
FILTER FEED TANK
FILTERED EFFLUENT TANK
HRSCC SLUDGE THICKNER
INTERMEDIATE SUMP
AMERICAN PETROLEUM INSTITUTE (API) & TPI UNIT
PROCESS FILTERATE SUMP

YEAR 2017
LOCATION: ANKLESHWAR

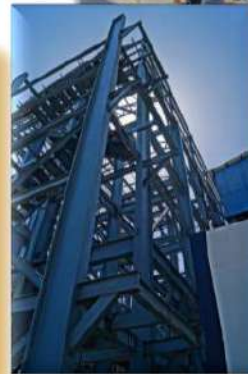
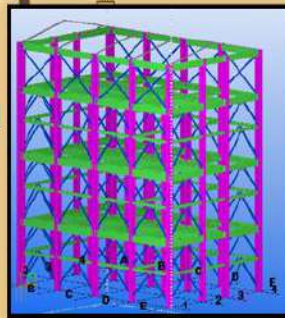
PROJECT: EDOT PLANT STEEL STRUCTURE
CLIENT: SONGWON SPECIALTY CHEMICALS INDIA PVT. LD.

ANALYTICAL MODEL



ACTUAL PHOTOGRAPH

FABRICATION MODEL

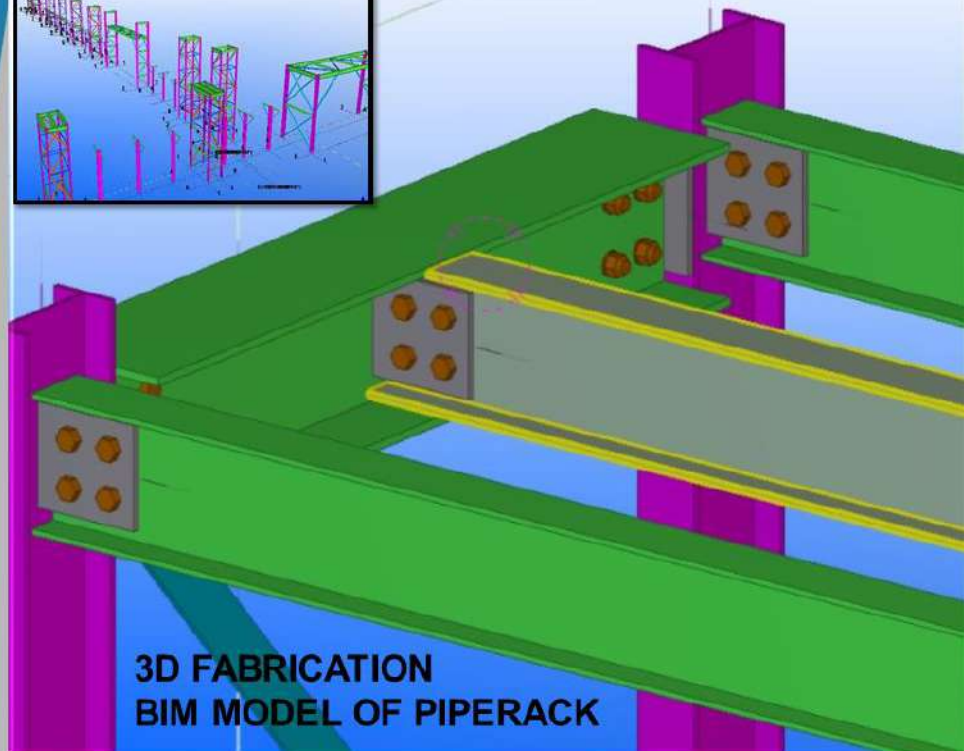
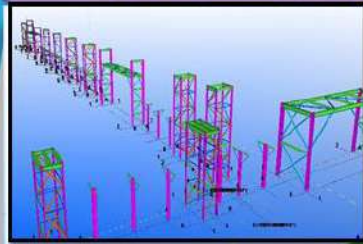


MAIN PROJECT FEATURES

- Raft foundation analysis in constrained area avoiding existing pipe rack foundation
- Analysis and design of Steel superstructure in Staad pro as per IS 800
- To prepare Fabrication shop drawings and bill of material using 3D BIM software
- To provide interconnection between existing plant and designed steel plant

YEAR 2015
LOCATION: ALGERIA

PROJECT: COMPRESSION STATION GR5 HRM
MAIN CLIENT: SONATRACH.
OUR CLIENT: STEEL KONNECT (INDIA) PVT. LTD.



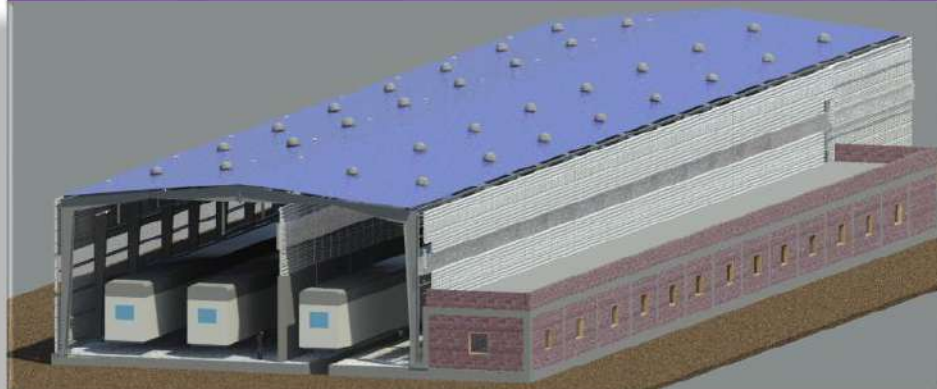
**3D FABRICATION
BIM MODEL OF PIPERACK**

MAIN PROJECT FEATURES

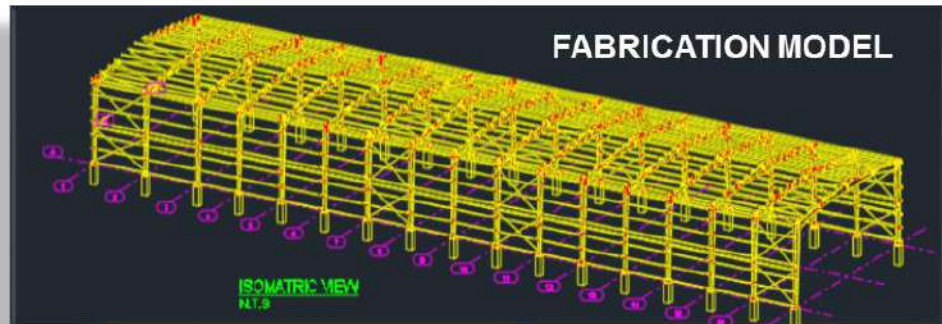
- Capacity based connection design for pipe rack, shelter structure and various platform
- Algerian codal guideline was used for connection design
- Fabrication model using 3D BIM modelling was used
- Preparation of Assembly drawings as per Transportation/ Shipping strategy
- Dodsal Engineering and Construction FZE were proof checker for design

YEAR 2017
LOCATION: VADODARA

PROJECT: PAINT SHOP SHED AND INSPECTION PIT FOR OVERHEARING OF 200 BCHNL WAGONS PER MONTH FOR WESTERN RAILWAY
CLIENT: NEUMAT ENGINEERS (INDIA) PVT. LTD.



3D BIM CONCEPTUAL REVIT MODEL



FABRICATION MODEL



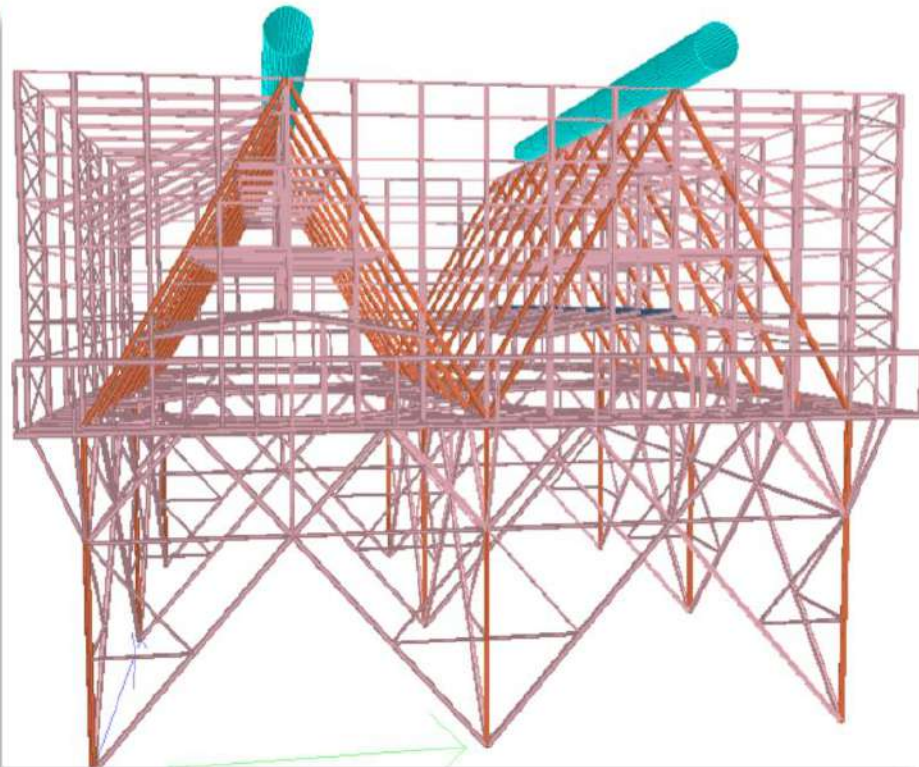
ACTUAL IMAGE OF COMPLETED PROJECT

MAIN PROJECT FEATURES

- Analysis & Design of PEB shed using Cold form section as per IS 800
- Foundation design, Structure design and Generation of fabrication drawing was part of scope

YEAR 2014
LOCATION: DELHI

PROJECT: AIR COOLED CONDENSER SYSTEM
CLIENT: C DOCTOR INDIA PVT. LTD.

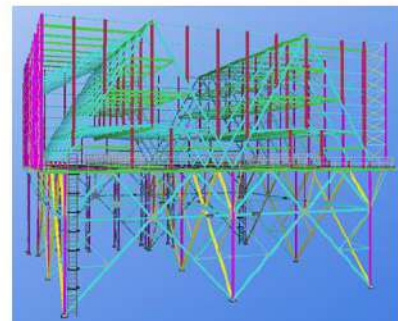


ANALYTICAL MODEL OF AIR COOLED CONDENSOR IN STAAD PRO

MAIN PROJECT FEATURES

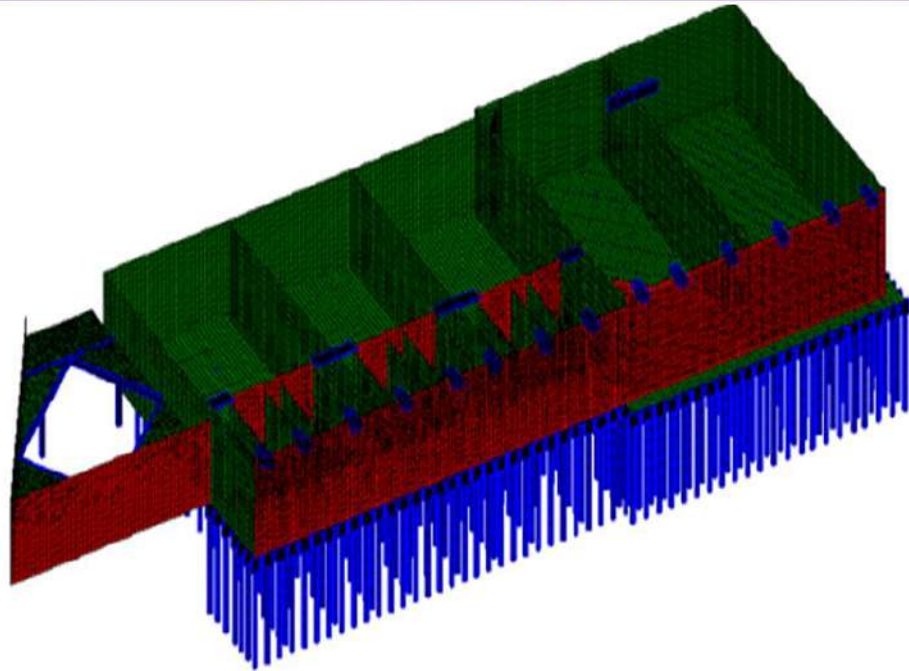
- Analysis & design of Air cooled condenser & pipe rack system as per IS 800 WSM
- Connection design for ACC & Pipe rack
- Preparation of 3D BIM Fabrication model
- Fabrication shop drawings and bill of material

FABRICATION MODEL



YEAR 2014
LOCATION: KOCHI

PROJECT: ETPFOR IREP OF BPCL AT KOCHI REFINERY
PROOF CHECKING CONSULTANT: ENGINEERS INDIA LIMITED
CLIENT: PARAMOUNT LIMITED



ANALYTICAL 3D BIM MODEL WITH PILE SOIL INTERACTION

MAIN PROJECT FEATURES

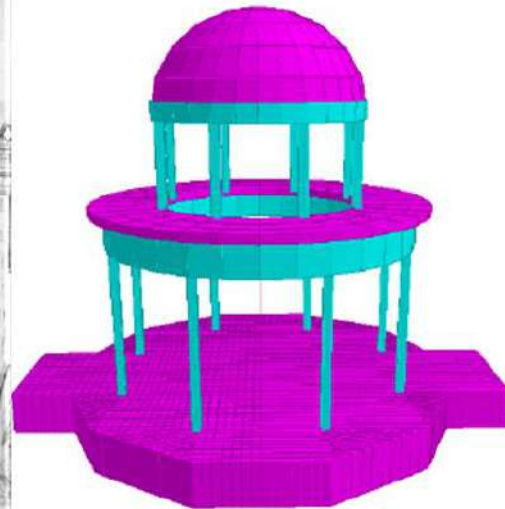
- 100 m x 33 m x 8m SBR, ACT, TWT RCC structure
- Total number of piles 600 under structure
- Longer side was having earth retention on one side and other side was without earth
- Structure was critical for stability against sliding due to earth retention on longer side and no balancing backfill on opposite side
- Lateral capacity of piles along with passive pressure from raft was considered to stabilize sliding
- Design of RC wall structure and base slab was done using IS 3370 LSM for 0.2mm crack width

YEAR 2016
LOCATION: TAMPA, FLORIDA

PROJECT: ROTUNDA STRUCTURE FOR SKP ESTATE
MAIN CLIENT: SYNERGY BUILD & CAST LLP
OUR CLIENT: SHIV AUM CONSULTANTS



CONCEPTUAL IMAGES



ANALYTICAL MODEL



MAIN PROJECT FEATURES

- Composite structure of RCC foundation, Steel Columns, RCC slab, and RCC dome, all elements cladded with Stone
- Analysis & design of Rotunda Structure as per ACI & AISC code.
- Analytical Software was prepared in Staad Pro
- Proof checking of design & drawing was done by Principal Engineer



Name of assignment or project: WTP and Clear Water Reservoir at TP1 and MBR at TP2E in DSIR

Year : 2018 -2020

Location : Dholera SIR

Client : SPML Infra Limited

Third Party Approver: Stup

Consultants

Project Management Consultant:

AECOM

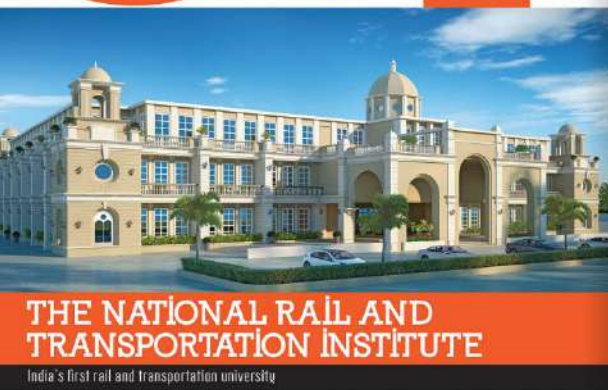
Main project features: Performed Structure design for WTP and MBR units and foundation design with pile foundation.

The scope also included providing BIM model for overall project with Level of Detailing 400 and covering 4th and 5th Dimension i.e. Scheduling and Estimation. BIM was done using Autodesk framework.



FACT FILE
Client: Western Railway, Construction Department, Vadodra
Client/Project/Contractor: Aum Structbuild Private Limited
Architect & P.M.C.: Safe Consultants.

RENAISSANCE ARCHITECTURE



THE NATIONAL RAIL AND TRANSPORTATION INSTITUTE
India's first rail and transportation university

The National Rail and Transportation Institute (NRTI) is a vision of the Honorable Prime Minister Shri Narendra Modi in India's first university focused on transport-related education, multidisciplinary research and training. NRTI is specifically established to create a resource pool of best-in-class professionals for the railway and transportation sector.

In line with University requirement both architecturally and structurally for vertical expansion. The project was headed by Western Railway Construction department, Vadodra. Safe Consultants were provided with opportunity to lead the project as Architectural and Structural Consultant.

Structural Details
The existing building was 50 m x 52 m in plan. Its structure which was 20 years old building. As per record provided by construction department, the structure was designed for 542 kN/m² and hence there was no issue in having a vertical extension. The existing building was utilized by NAR, occupants with Cyber and Library department. Their convenience during execution was also part of design recommendation as zero down time was provided. The routine functioning of respective departments needed to be continued and major operations were shifted to weekend holidays.

Features
Salient feature of this project design aspect was to design facade in line with language of existing building within the premises of NAR, which is "Tirupathi Veda Palace". It was named after the last ruler of Baroda State, Pratapsinh Rao Gaekwad. Its construction started on 15 February 1908. It was completed on 30 July 1916, which was then furnished by 1918. It was designed by Charles F. Stevens, son of P.W. Stevens, a British Architect who designed famous Victoria Terminus of Bombay.

“Focused on transport related education, research and training, National Rail and Transportation Institute is India's first Rail and Transportation university which is vision project of Prime Minister Shri Narendra Modi. The project scope was to design facade and vertical extension of existing building as per Architectural requirements. The existing Building was utilized as computer and Data center by National Academy of Indian Railways (NAIR). The challenges in structural aspects of this project was to go for vertical extension, and providing architectural effect to front facade using steel structure. The timeline for executing the project was only two months initially and along with internal loading work, it was extended to two months further. Similarly, project was always challenging, conceiving non-availability of existing structural drawings and hidden surprises. The design also required to include strategy of execution so that internal working of building was not disturbed. There was no down time available during the entire course of project. The project won accolades from Ministry of Railway and the team was associated with "Special Service Certificate" by Ministry of Railway.



JIGAR RANA, Director, Safe Consultants

The Palace is designed in Renaissance architecture. The entrance is adorned by exquisite carvings and the palace is noted for its architectural grandeur highlighted with columns and arches. Carvings of creepers, flowers, leaves, birds and animals on the columns make the palace lively. It has columns and arches drawn from South India, Central India, North India and Islamic tradition. To achieve this language in architectural facade was a challenging task. However, we had designed the architectural language in line with this. This created challenge for structural team in terms of loading, forms required for Architectural requirement and at the same time addressing challenges of refurbishment of an old building.

With the use of structural steel, these challenges were taken up and overall facade was created using combination of Structural steel, camouflaged with cement sheet applied with stone veneer as cladding companion to give stone cladding effect. This effectively helped to reduce time and efforts along with cost control. The sample for this system was tested with heat and water penetration test. Once approved by the authority, the same system was applied in overall facade and has come out well.

The front facade was designed in such a manner that structurally, existing beams and columns were used to anchor facade structural members by anchor fasteners. However, care was taken during design that major load was transferred to its individual foundation and load on existing structure was least transferred. The same fundamental was considered in vertical one floor extension. Instead of going with concrete column extension, the steel columns were erected from concrete columns with required anchor fasteners along with composite deck slab system as slab system. Composite deck slab system ensured that the formwork is self-supported and provided quick execution of slab. This also allowed space below to be free during slab casting for various utilities and finishing works.

Further, the dome was also a part of design as entire element over the extended slab instead of casting overall dome support and dome itself in RCC, a steel structural supporting frame along with fiber reinforced polymer sheet as scaffolding formwork was used for casting, superior concrete layer over it. This ensured the overall work is done fast and eliminating formwork and curing time required for RCC works. One more advantage steel structural components and composite deck system gives it, it reduce tremendous dead weight in comparison to RCC. This has a value addition in terms that although the building was designed for 542, the building was 20 years old and thus, loading with heavy masses will not be advisable.

To ensure ease of procurement and fabrication, the structural team designed the front facade elements along with slab extension elements in such a way that few variations of structural steel sizes were done. Hollow square sections having size 105 x 300 x 300 and HSS 150 x 50 were mainly used in overall project along with other section sizes. The balusters were of marble which were inserted in steel structure platform which formed standing balcony in front facade.

The cornice architectural details were achieved by using various steel structural sections fabrication and later on applying paint. The finished product showed very good results and helped again in reducing time and efforts. The overall refurbishment activities along with execution took 4 months to complete. The project will form one of the most challenging projects for all the stakeholders as the response time from each of them was excellent considering the conventional and routine mindset of various departments.

There is a central open to sky area in existing building. This area was beautifully refurbished along with inclusion of water body giving a grandeur feeling while entering the building. To provide air circulation in this open to sky area, a tensile fabric structure was introduced covering OTS. The structural columns for supporting tensile fabric were considered structural steel columns to integrate easily with tensile fabric structure design. As a consultant, to ensure easy and collaborative work between various agencies and disciplines, building information modeling was used by preparing a Revit Architectural model. This BIM model ensured all the database is available and accordingly all decisions considering multidisciplinary aspects were taken timely. The model also helped execution team to understand and visualize architectural and structural details.

The project won accolades from Ministry of Railway and the team was appreciated with "Special Service Certificate" by Ministry of Railway. The project was inaugurated by Chief Minister Shri Vijay Rupani and Rail Minister Shri Piyush Goel on 15th December 2018.

ANNIVERSARY SPECIAL



JIGAR RANA
DIRECTOR
SAFE CONSULTANTS

Focused on transport related education, research and training, "National Rail and Transport Institute" is India's first Rail and Transportation university which is vision project of Prime Minister Shri Narendra Modi. The project scope was to design façade and vertical extension of existing building in line with Architectural requirement. The challenges in structural aspects of this project was to perform vertical extension, and, providing architectural effect to Front façade using steel structure. There was no down time available during the entire course of project. The project won accolades from Ministry of Railway and the team was appreciated with "Special Service Certificate" by Ministry of Railways.

THE NATIONAL RAIL AND TRANSPORTATION INSTITUTE, AHMEDABAD

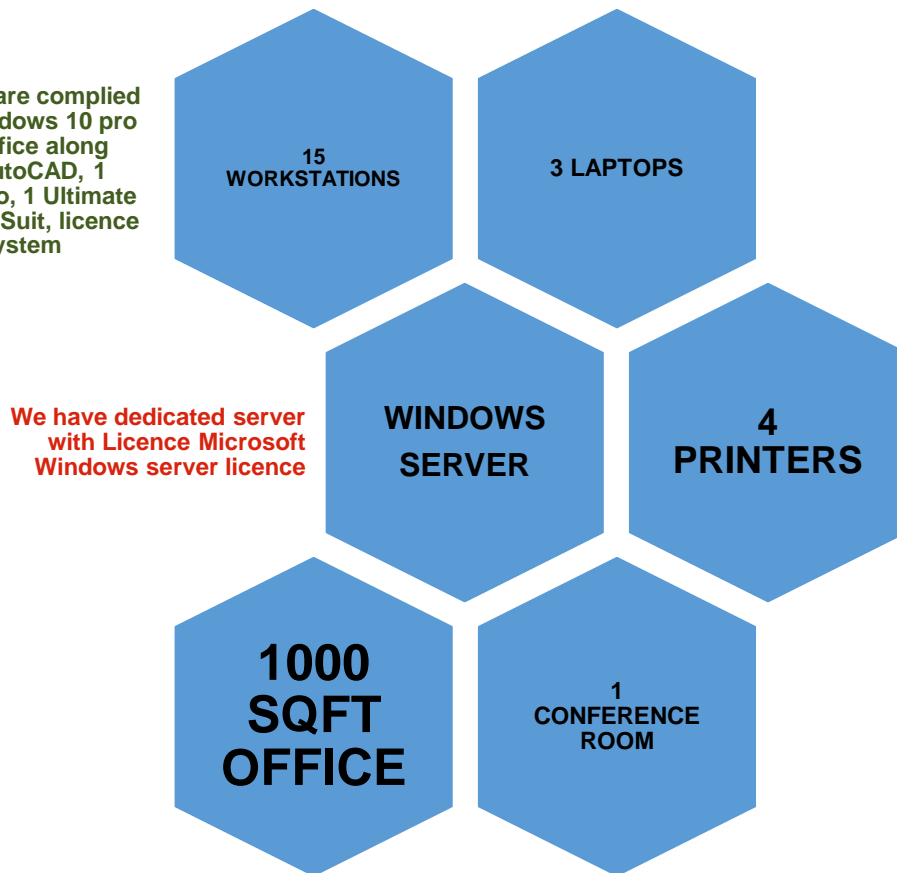


The existing Cybrary Building required to be refurbished in line with University requirement both architecturally and structurally for vertical expansion. The existing building was 50 m x 52 m in plan G+1 structure which was 20 years old building. As per record provided by construction department, the structure was designed for G+2 facility and hence there was no issue in having a vertical extension. The existing building was utilized by NAIR occupants with Cyber and library department. Their convenience during execution was also part of design recommendation as zero down time was provided.



INFRASTRUCTURE FRAMEWORK

All Workstation are complied with licence Windows 10 pro and Microsoft office along with 5 licence AutoCAD, 1 licence Staad pro, 1 Ultimate Building Design Suit, licence antivirus in all system



OUR FOOTPRINTS

OUR TEAM AND STRENGTH

OUR TEAM TOGETHER EVERYONE ACHIEVES MORE



Team Leader:

Er. Jigar Rana - Founder & Team Leader, M.E. Civil CASAD, Pursuing PhD in 7D BIM for Refurbished Structure and its FM

Team:

- Er. Jigar Rana, Technical Director, Structural Expert – 20 years of Experience
- Er. Devang Prajapati, Water Expert, Principal Engineer – 20 years of Experience
- Ar. Tanushree Gaekwad, Sr. Architect and Landscape Designer
COA no: CA/2015/72820 – 8 years of Experience
- Ar. Jaimina Shah, Senior Architect and Urban Planner
COA no: CA/2015/69482 – 8 years of Experience
- Er. Allen Francis, Associate Green Design Consultant – 4 years of Experience
- Er. Mansi Shah, Mtech Structure, Senior Structural Engineer – 5 years of Experience
- Er. Sahid Jariwala, Mtech Structure, Structural Engineer – 2.5 years of Experience
- Er. Krishnakant Patel, Diploma Civil Engineer, CAD Technician – 13 years of Experience
- Sandip Parmar – BIM Modeler – 5 years of Experience

OUR STRENGTH - SOFTWARE SKILLS



Staad Pro
ROBOT
AutoCAD
REVIT Architecture
REVIT Structure
REVIT MEP
Inventor
Navisworks
ReCap
InfraWorks
3D Max Design
ShowCase
Structural Detailing
Raster Design