Thomasson Industrial Services

Qualifications

with emphasis on ***Aerospace***

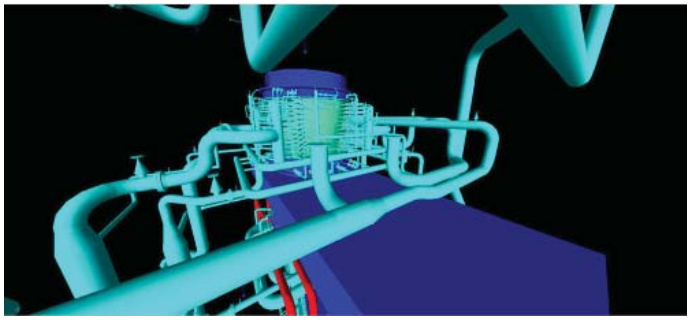


Table of Contents

Overview

TIS has senior professionals in key leadership roles in the major disciplines and has strategic alliance firms that provide additional capacity and specialized capabilities to suit the requirements of specific project types and localities.

Thomasson Industrial Services (TIS) is a full service professional planning, design and consulting firm that provides all disciplines required for planning and design of industrial site and facilities, manufacturing and industrial processes, and power generation and energy-related projects.

TIS is an alliance of I. C. Thomasson Associates, Inc. (ICT), a consulting engineering firm headquartered in Nashville, Tennessee, with prominent design firms Design Innovation Architects, Manous Design, and Carpenter Wright Engineers. ICT has provided consulting engineering services across the USA and abroad for decades in a wide range of market sectors. TIS offers planning, consulting, design, construction/start-up support and program/project management services to our clientele in the industrial, process and power generation and utilities market sectors:

- Master Site, Infrastructure and Facility Planning
- Facilities Assessments
- Building Information Modeling (BIM)/3D Design
- Site/Civil Surveying and Engineering/Landscape Architecture
- Architecture/Life Safety & Codes Analyses
- Sustainability Consulting Services/Renewable Engergy Design
- Structural Engineering/Integrated Steel Design
- Mechanical Engineering (HVAC, Plumbing, Piping)
- Fire Protection Engineering/Explusion Protection & Prevention
- Refrigeration Engineering (Central plants and split systems; distribution systems; cool rooms; cold storage)
- Electrical Engineering (Power, Lighting, Low Voltage/Specialty systems)
- Electrical Distribution Systems Engineering
- Process/Mechanical Engineering (Planning Studies, Equipment Layout, General Arragnement, Equipment Installation Packages, P&IDs, Utilities Capacity Analysis and Design)
- Industrial Systems Engineering/Layout and Workflow Optimization
- Material Handling Systems
- Lean/Continuous Improvement Strategies and Impementation
- Controls & Instrumentation Engineering (Real-time Automation, Data Acquisition, Custom Controls/ Operator interface, Analytical Instrumentation and Environmental Monitoring)
- Energy Engineering and Consulting/Energy Assessments
- Environmental Engineering, Permitting and Consulting Services
- Water/Waste Water Treatment and Distribution Systems Engineering
- Intelligent Transport Systems (fiber/broadband, data/comm, IT)
- Construction Start-up Support/Field and Commissioning Services
- LEED Commissioning, and Measurement & Verification services
- Bidding/Negotiation/Procurement Phase SUpport Services
- Construction Phase Support Services
- Program and Project Management Services

I. C. Thomasson Associates, Inc.

- Founded in 1942
- Employee owned
- Over 200 professional employees
- 69 Professional Engineers
- 14 LEED accredited professionals
- Corporate Headquarters - Nashville, TN
- Over 600 projects each year, large and small
- Many projects from repeat clients

I. C. Thomasson Associates, Inc.

Thomasson
Industrial Services

Our Alliance Partners

Carpenter Wright Engineers
Structural Consultants

- Established: 1976 (44 yrs. in business) with offices in Nashville, TN & Knoxville, TN
- Sectors: Industrial, Institutional, Commercial, Residential and Infrastructure Structures
- Specialties: Manufacturing Facilities for steel, automobiles, tires, plastics and food
- Specialty Skills: Mission-critical Data Centers and Long-Span Aircraft Hangers
- Unique procedures to accelerate the design, fabrication and delivery of steel framing systems.

DIA
Design Innovation
ARCHITECTS + INTERIORS + PLANNING

- Established: 1989 (30 yrs. in business) based in Knoxville, TN
- Services include: architecture, interior design, land planning, and project management
- Sectors: Multi-Family & Single- Family Residential, Corporate, Commercial, Hospitality & Theaters, Retail, Food Service, Industrial / Manufacturing, Religious, Educational, and Health Care
- Project Size from 2,000 sq. ft. to over 1,000,000 sq. ft. with budgets from $50k to upwards of $200m

MANOUS DESIGN

- Established: 1992 (over 25 yrs. in business) based in Lebanon, TN
- Services include: Architectural Design, Life Safety, Master Planning, Civil Engineering, Structural Engineering, Interior Architecture & Design, Landscape Design, 2D and 3D Computer-Aided Designs
- Budgets have ranged from $250,000 to more than $250 million
- Projects include everything from private residences to master-planned projects, from historic restorations to mixed-use retail centers, and from commercial distribution centers and industrial facilities to country clubs.

LEED® NC Silver

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing and Fire Protection

NASA Building 4221
Marshall Space Flight Center, AL

ICT provided mechanical, electrical, plumbing and fire protection design for a new 140,000 SF, five-story office building housing NASA engineers, scientists and support staff.

Electrical infrastructure includes an extensive submetering platform which communicates directly with the NASA UCS system. Metering results shall be incorporated into NASA's energy reduction program and shall be utilized in a future LEED EB certification.

Commissioning services and an energy analysis were performed for this facility.

LEED® NC Silver

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing and Fire Protection

NASA Building 4220
Marshall Space Flight Center, AL

ICT provided mechanical, electrical, plumbing and fire protection design for a new 140,000 SF, Class A, five-story office building housing NASA engineers, scientists and support staff. Features included atrium, office space, conference rooms and computer rooms.

Electrical infrastructure includes an extensive submetering platform which communicates directly with the NASA UCS system. Metering results shall be incorporated into NASA's energy reduction program and shall be utilized in a future LEED EB certification.

Hankook Tire Manufacturing Plant
Phase 2
Clarksville, TN

DBS and Associates Engineering, Inc.
Civil

Carpenter Wright Engineers
Structural

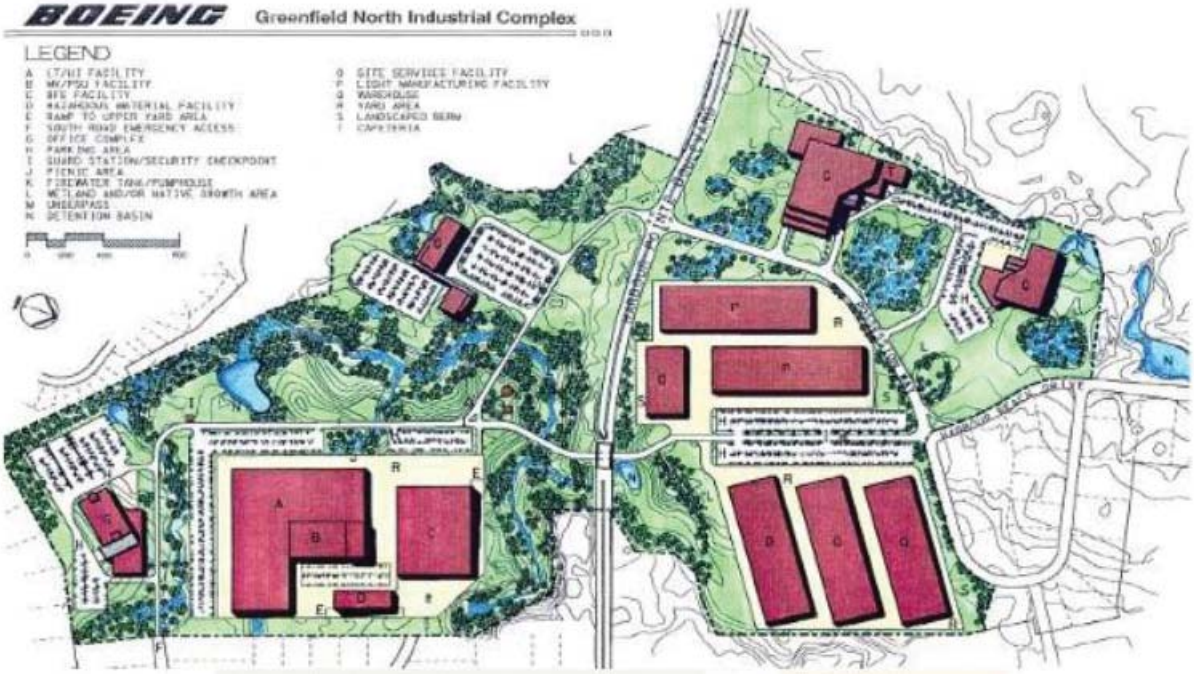
I. C. Thomasson Associates, Inc.
Process Utilities, Mechanical, Electrical, and Fire Protection Design

Design Innovation Architects
Architect

Manous Design
Architect

Full A/E Services were provided by the Thomasson planning and design team, teaming with a Construction Management firm, acting as the Owner's Representative / Project Manager for the Phase 2 expansion design-build contract of the 1,060,000 SF main plant and ancillary buildings. The Project Management team developed the RFP and Design Bridging Documents used to secure final Design-Build proposals from select, invited bidders.

Boeing Commercial Aircraft
Greenfield North Industrial Complex
777 Sub-Assembly Complex and Land Plan



Manous Design
Concept Design and Land Planning

Size: 1,050,000 SF

Budget: Investment in excess of $150,000,000

Michael Manous served as lead planner for the facility. He provided all land planning for the assembly, component warehousing, corporate office, and employee amenity center. Concept design was completed for the 777 sub-assembly facility constructed in 1992.

GE Aviation
Project Badge
Huntsville, AL

Design Build

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing, Fire Protection, IT and Process (Mechanical and Electrical) Design

This project included MEP, FP and IT, as well as Process Mechanical and Electrical Design services, for two buildings joined by a connecting administrative office totaling approximately 400,000 SF. ICT was responsible for generating design drawings and specifications to assist the general contractor in constructing the building shell and internal infrastructure to support the owners process requirements.

The project included two separated compressed air plants that serviced the tow-tape and fiber facilities respectively. The tow-tape plant included two (2) 350 HP Oil-free rotary screw, water-cooled, air compressors with provisions for a third future 350 HP air compressor of similar make and model. Each air compressor in the tow-tape plant was also paired with a 1500 scfm heated blower desiccant dryer system, filters, and BACnet based controls system. The fiber plant included two (2) 100 HP two stage rotary screw, water-cooled, air compressors. Each air compressor in the fiber plant was also paired with a 500 scfm heated blower desiccant dryer system, filters and BACnet based controls system. The primary compressed air piping systems were designed and coordinated with the process requirements. The tow-tape plant consists of an 8" compressed air header that is distributed out to the process areas, and the fiber plant consists of a 3" compressed air header.

The project consisted of designing exterior tank farms for flammable and combustible liquids which were also regulated by the OSHA 1910.119 Process Safety Management regulations. ICT helped the Owner by designing the campus pipe routing such that periodic non-destructive ultrasonic thickness testing of piping (required by the PSM mechanical integrity subpart) could be more easily accomplished.

ICT provided codes review services for a process building which would have required explosion relief panels to vent potential deflagrations. Through our guidance, the Owner was able to implement a performance-based design alternative which allowed the hazards to be managed by administrative procedures.

GE Aviation
Structure and Machining Plant
Auburn University West Technology Park
Auburn, AL

Design Build

LEED® NC Silver

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing and Fire Protection

ICT provided mechanical, electrical, plumbing and fire protection design, and construction administration for a 300,000 SF advanced manufacturing plant that produces precision, super-alloy machined parts for GE jet engines that power future commercial and military aircraft and support the vast fleet of GE jet engines already in service.

Features

- 280,000 SF shell production space
- 24,000 SF two-story office space
- Utility/process piping and equipment
- Centralized compressed air system
- Centralized cooling tower system

Confidential Aerospace Client, SC

I. C. Thomasson Associates, Inc.
Mechanical, Plumbing, Fire Protection and Electrical Design

ICT was contracted to conduct a detailed evaluation of the current operating conditions for the HVAC systems for a major supplier to a major commercial aircraft manufacturer. The existing plant is well over 100,000 sf in size and plant operations include forming, machining, heat treatment, coating, washing, et al among other processing functions.

The plant air handling/ventilation, cooling and heating systems as they interact with the on-going manufacturing / processes within the plant were studied to help mitigate issues and improve the operating environment for both the process and employees.

Review and conceptual design improvements and evaluations of the systems were conducted related to the HVAC systems and plant operations. Air balance diagrams, HVAC load calculations / energy modeling was produced to aid in a better understanding of process related requirements versus plant infrastructure capabilities. Process-related fumes/particulate capture and control; internal and outdoor/intake air humidity level concerns; filtration/cleanliness level concerns, and air balance, movement and isolation/pressurization of distinct spaces for improved containment and quality control were studied and evaluated for their impact and potential improvement/optimization.

Further testing activities are planned to develop the optimal path forward to improve these operations, leading to final design and construction activities for implementation of the recommended plant improvements.

Wonder Porcelain
Lebanon, TN

Design Innovation Architects
Architect

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing and Fire Protection

Carpenter Wright Engineers
Structural

Civil Site Design Group
Site/Civil

Construction Cost
$60,000,000

Completion Date
05/2017

Our team (DIA, ICT, CWE and CSDG) provided full planning and design services, including architectural, site/civil, structural, mechanical, electrical, plumbing and fire protection design services for a new 750,000 SF single-story pre-engineered metal building for a tile manufacturing and storage facility.

The project includes the manufacturing plant / warehouse; an office building which includes corporate offices, showroom and R&D facilities.

The Master Plan for the project looked at multiple building configurations and an ultimate planned build-out of potentially 2.25 million SF under roof, on an approximately 150 acre site.

Daltile
Dickson, TN

Manous Design
Architect

I. C. Thomasson Associates, Inc.
Mechanical

Carpenter Wright Engineers
Structural

Architectural, structural, preliminary mechanical and project management services were provided for a new 1.2 million SF porcelain tile manufacturing facility. Six primary functional areas of the facility are raw material storage, body prep and spray drying, glazing, kiln, packing, and warehouse storage.

Arnold Engineering Development Complex
Arnold AFB, TN

Design Build

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing, and Fire Protection Design

Facilities Acquisitions for Restoration and Modernization (FARM) Solicitation FA9101-16-R-0100

The FARM Indefinite Delivery Indefinite Quantity (IDIQ) contract is a multiple award contract for mechanical, electrical and controls design and construction. The Statement of Work (SOW) sets forth basic requirements for construction and engineering activities supporting the Facilities Acquisitions for Restoration and Modernization (FARM). The SOW is organized and developed to provide maximum flexibility in the use of the contract vehicle. Basic requirements are further refined through the use of individual protect Task Order (TO). TOs define the project requirements in terms of performance, appearance, criteria, and/or specification with sufficient detail that permits a contractor to provide a proposal with reasonable performance, cost and schedule risk. TOs are issued for projects at various stages of design and construction. ICT provided mechanical, electrical and controls design for this contract.

16S Nozzle / Diffuser Return to Service

The 16S Wind Tunnel complex is a supersonic tunnel with Mach range up to 4.75. Currently, the existing nozzles uses a series of jacks to adjusts the nozzle plate profile. The existing jacks are driven by hydraulic motors. Design services were provided for replacement of the hydraulic motors with electric water cooled motors. Key 16S Diffuser systems are located in the 16S Plenum Chamber, which range up to 300 F and .003 to 14.2 PSIA A new cooling water plant, distribution system and controls were provided to produce a variable flow system in response to motor needs.

The scope of this effort included modifying the diffuser drive system; providing a system for motor cooling; ; providing and routing the required electrical power for diffuser systems; replacing drive motors; providing mechanical safety limits; providing wall position measurement; and providing a new control system for the required system maintenance and operational tasks. Demolition and removal of the existing PWT 16S Diffuser Control System was required.

Propulsion Wind Tunnel 16S, Raw Water and Seal Air

ICT provided design and construction administration services for raw water and seal air system piping replacements and upgrades at the AEDC Propulsion Wind Tunnel (PWT) 16 foot supersonic (16s) Test Unit. The project consisted of two parts: 1. Demolition and upgrades of supply and return raw water piping, emergency water piping, and control valves to provide cooling water to bearing skids for the 16S wind tunnel fan drive. 2. Demolition and upgrades of a compressed air system (seal air) and seal air control valves to individual bearing housing shaft seals and a drive shaft seal for the same 16S wind tunnel fan drive.

Arnold Engineering Development Complex
Arnold AFB, TN

Design Build

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing, Fire Protection Design and Commissioning

Repair/Upgrade VKF Dryers W15-W18

ICT designed replacement gas-fired regeneration systems for existing low pressure and high pressure desiccant dryers at the Von Karmen Facility (VKF) Plant at AEDC. The VKF Plant continuous air supply system delivers high-pressure process air to various wind tunnels that operate from Mach 1.5 to Mach 10. These desiccant dryers are used to dry the process air to very low dewpoint temperatures required to attain supersonic and hypersonic wind tunnel flows free from water vapor condensation.

The design included regeneration air, gas burner, chilled water, and raw water systems that were fully integrated with a PLC for single operator control. ICT also provided construction phase and Commissioning services for this project. The project was deemed a success and achieved the target space temperatures and dewpoint temperatures within the required times stipulated by the Government.

I. C. Thomasson Associates, Inc.
Mechanical Design

T-11 Cold Supply Leg Addition

ICT provided engineering design services for the installation of a cold supply ducting leg from the TJ turbine leg to the cold supply leg of the T11/T12 header. ICT provided mechanical design and stress analysis of high volume cryogenic process air piping for turbine engine testing.

Arnold Engineering Development Complex
Arnold AFB, TN

Heater Cooling Building and Electrical Duct Bank

ICT provided full design services for a new Heater Cooling Building that was located adjacent to the High Temperature Lab Building 722. ICT provided construction drawings for the steel building, heavy slab foundation, and electrical duct bank for the new heater cooling building. Heavy coordination of existing storm and sanitary infrastructure and some minor utility relocation was necessary to provide design direction to our design/build contractor for the new building. The heater cooling building was designed to house four (4) new medium voltage (MV) electrical loads including three (3) 3000-HP pump motors and one new 1500-kVA unit substation. The new power feed was provided to the new building from an existing unit substation nearby. The steel framed building design was coordinated closely with the contractor's pre-engineered metal building vendor including all roll-up doors, manned entry/egress doors, the openings for mechanical ventilation systems, and lighting protection system. The building was fully sprinkled by an automatic wet system in accordance with all unified facilities criteria. This project was largely supporting large motors and the electrical infrastructure required to be installed in slab to accommodate the user equipment. Electrical load studies, Underground Utility coordination, Grounding System design and process mechanical support were all key components to this project and how we provided design direction to our design/build contractor to construct this new heater cooling building facility.

As part of continuous flexibility and changes that the user with Arnold Engineering Development Center (AEDC) needed, the contract was also adjusted to provide an additional lean-to storage space off the rear of the new facility. The original slab foundation slab was extended and the pre-engineering building was also adjusted to accommodate the additional square footage of semi-heated and ventilated area for storage purposes.

Office Area Renovation

The work consists of demolition and replacement of the HVAC system and associated piping, ceiling, lighting, and interior finishes. A fire suppression system was provided for the Local Electronics Building (LEB) 531 as well as the supervisor's office area at the J5 Hypersonic Clean air Test Facility Building 522. Work included interior finishes and installation of a mass notification system for the building.

Arnold Engineering Development Complex
Arnold AFB, TN

Replace A-Plant and B-Plant Exhaust Motors

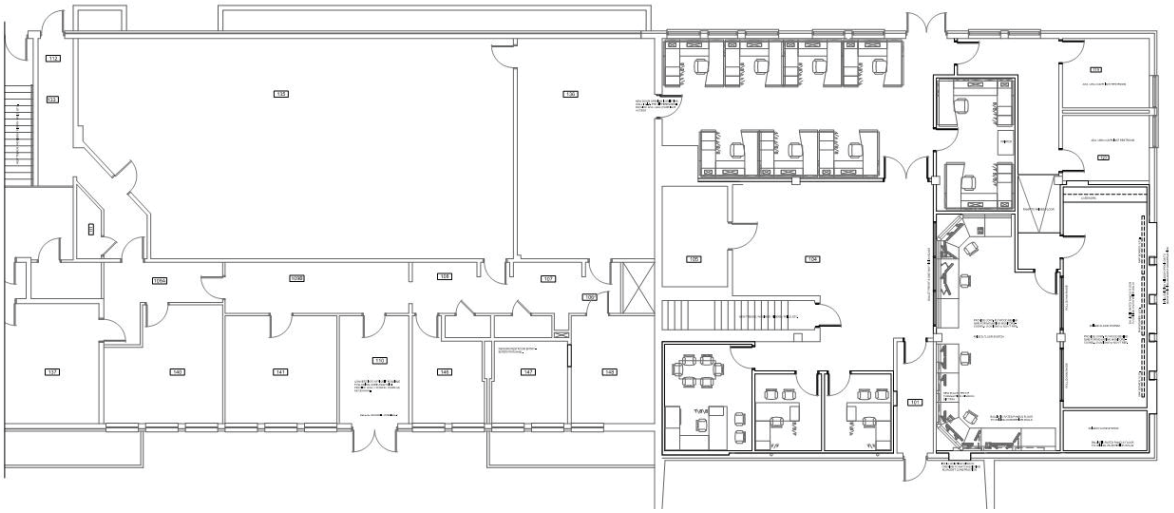
Replace A-Plant Exhaust Motors

The A plant exhaust is an exhaust air service primarily in support of Turbine cells, J1, J2 and J6. The exhaust plant consists of 2 compressor drives (XS1, and XS2). These drives can be used in various configurations to set altitude conditions for turbine and rocket engine testing. The existing drive assembly is replaced with a single variable speed, electric driven, medium voltage 34,196 HP (25,500 KW) motor provided by Siemens Corporation. The motor drive shaft directly couples to the existing gear speed increaser with a shaft coupling provided by the manufacturer. The replacement motor and VFD start the compressor drive train to synchronous speed at local atmospheric pressure (14.4 PSIA). This operation is termed a “full load” start. When both compressor drive trains are required, they start simultaneously in parallel (due to the configuration of the process air ducting and valves). The scope of this effort included extension of the lubricating oil and raw water systems, structural and electrical modifications for the new equipment and demolition of the existing systems.

Replace B-Plant Exhaust Motors

The B plant exhaust is an exhaust air service primarily in support of Turbine cells T3, T4, T11, J1 and J2. The exhaust plant consists of six compressor drives (L1, M1, H1 and L2, M2, H2). These drives are used in various configurations to set altitude conditions for turbine and rocket engine testing. The project consists of design, demolition and replacement of five medium voltage wound rotor motors, five liquid rheostats and associated equipment. The new motors were rated at 10,000 HP and provided with variable frequency drive system. The scope of this effort included extension of the lubricating oil system, structural and electrical modifications for the new equipment and demolition of the existing systems.

Arnold Engineering Development Complex
Arnold AFB, TN



Fire, Police & Communications (FP&C) Base Defense Operations Center (BDOC) and Basement / Communications Offices Facility 251

Design Build

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing, Fire Protection and Communications Design

An Emergency Communications Center (ECC) was constructed by renovating existing spaces to provide a larger Base Defense Operations Center (BDOC). Space was provided for two police and two fire dispatch personnel, plus associated equipment and furniture, for use during peak business times and during emergency responses. New office spaces were created for displaced personnel and the existing BDOC area was repurposed. Adjoining basement and communications wings of the facility were renovated. Internal access between communications and security first floor was designed. The project is located in the basement and first floor of the FP&C Facility 251. A temporary trailer was designed for six employees with utility hookups. Sump and dewater system repair was designed by replacement for basement.

Arnold Engineering Development Complex
Arnold AFB, TN

Design Build

I. C. Thomasson Associates, Inc.
Mechanical and Electrical Design

Chiller RC22.2 Refrigeration System Building 929, AEDC Phase V

ICT provided engineering design services for the installation of one 4,250 ton York YD chiller. Piping plans, piping and instrumentation diagrams (P&IDs), and specifications were provided to the Owner. Piping plans showed the location of the new chiller, location of the new chiller starter, brine piping to the chillers, condenser water piping to the chillers, flow control to condenser water, refrigerant vent piping from the chillers, and pipe supports. The P&IDs showed the brine piping, condenser water piping, refrigerant vent piping, equipment, and instrument connections. Specifications were provided for pipe insulation, chiller insulation, piping, pipe fittings, pipe supports, and valves. Power connections and locations of the equipment were coordinated with the electrical contractor. Submittal review, RFI answers, and as-builts from contractors redlines were included in the construction administration.

Design Build

I. C. Thomasson Associates, Inc.
Mechanical and Electrical Design

Chiller RC12.1 Refrigeration System, C-Plant, AEDC Phase IV

Engineering design services including piping plans, piping and instrumentation diagrams (P&IDs) and specifications were provided for the installation of one 4,250 ton York YD chiller.

Piping plans included location of new chiller and new chiller starter, brine piping to the chillers, condenser water piping to the chillers, flow control to condenser water, refrigerant vent piping from the chillers, and pipe supports. P&IDs included brine piping, condenser water piping, refrigerant vent piping, equipment and instrument connections Specifications were provided for pipe insulation, chiller insulation, piping, pipe fittings, pipe supports and valves.

Power connections and location of equipment were coordinated with the electrical contractor. Submittal review, RFI answers, and as-builts from contractor's redlines were included in construction administration.

P465 Aircraft Maintenance Hangar
Marine Corps Air Station
Beaufort, SC

Design Build

The combination of a hangar, along with shops and administrative areas, provides for a challenging combination of occupancy types which requires careful air balancing, electrical loading as well as fire and life safety considerations.

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing and Low Voltage

ICT provided mechanical, electrical, plumbing and low voltage design services for a new 55,000 SF maintenance hangar that can house six F-35 for maintenance at the same time.

- Foam Based Fire Protection with a trench drain system equipped with an underground AFFF collection tank and diversion pit between the collection tank and sanitary sewer
- Compressed Air
- Overhead Crane
- Fall protection
- 400 volt system
- Dedicated Underground Cockpit Cooling System
- Plane Grounding

A two-story administrative and shop facility is attached to the hangar which is equipped with the following maintenance shops: Aviation Ordinance, Avionics, Seat, Life Support, Airframe and Power Line. The maintenance portion of the administrative area is equipped with a tool room. The office portion of the administrative building is equipped with a secure SCIF area for flight plan and mission briefings and debriefings, helmet storage, charts and maps as well as flight surgeon, XO and other offices and conference rooms. The administrative portion of the building was equipped with specialty systems:

- Solar Domestic Water Heating
- Specialized Exhaust for bench top soldering and welding functions
- Arms Vault with specialized HVAC and dehumidification systems and security measures
- Shop Electrical Grounding System
- Explosion Resistant Areas for Ejection Seat Systems
- Access Control for security

The project included a 95,000 SF, three-story parking structure which housed a PV system on the top deck that supplemented the electrical load in the adjacent hangar/administrative building.

Thomasson
Industrial Services

Team / Individual Experience
Aviation / Aerospace

Aerophysics Research Center
Huntsville, AL

Project Manager/Mechanical Engineer: Equipment layout and design of ancillary and gas distribution systems involved with a major Aerophysics Research (two-stage “light gas gun”) Facility; relocated from GM Delco Electronics in Goleta, California to Redstone Arsenal, Alabama. The defunct system had been used for 30 years in NASA and DOD aerophysics research used for design input for programs ranging from space shuttle shielding to simulated planetary atmospheres. New and relocated mechanical support systems included vacuum, nitrogen, helium, hydrogen, compressed air, dehumidification, hydraulic, and dust collection systems. The Scope of Work included all equipment layout and structural, mechanical and electrical design requirements. The contract also included the final assembly, acceptance inspection, and proof firing (at projectile speeds up to 14,000 feet per second) of the 254 mm bore and 133 mm bore light gas guns. The 254 mm gas was over 1000-feet long. Two smaller gun ranges were relocated to Redstone Arsenal for use as scavenged parts; well over 100 tractor trailer loads of equipment was relocated.

Boeing Aerospace
Huntsville, AL

Mechanical Engineer/Industrial Team Manager: Full A/E design services for 100-K clean room and utilities to serve a new Electromagnetic Interference Facility, and for an owner-furnished autoclave used for skin-forming of panels for Space Station Freedom program. Mechanical Systems included heating and ventilation, plumbing, fire protection, gaseous nitrogen, and compressed air. Compressed gas requirements involved the distribution and regulation of high flow rates at pressures in excess of 4000 psi.

Boeing GDIL Facility Modification Design
Phases I & II
Madison, AL

Mechanical Engineer: Conducted HVAC design services to renovate an existing lab building to house a new clean area process in support of vital systems for the National Missile Defense Program..

Brunswick Defense
Marion, VA

Industrial Team/Project Manager: Design of new air conditioning system for filament winding area of missile and jet fighter nose cone production facility. Used total energy wheel to recover sensible and latent energy from fiberglass nose cone process exhaust; transferred to 100% outside air cooling system; supplemented and effectively reduced conventional chilled water system by 50%.

Embraer Aircraft Hangar
Mesa, AZ

Mechanical Engineer for design of new facilities to support maintenance operations. New hangar is 28,000 SF with 13,200 SF in shop support areas and an administrative area. Hangar was connected to existing airfield taxiways with a new ramp to accommodate aircraft traffic. Designed to include an under hung bridge crane to facilitate the removal of aircraft engines and other maintenance functions. The facility was designed to include a paint booth.

Team / Individual Experience
Aviation / Aerospace

Embraer Aircraft Hangar
Windsor, CT
Mechanical Engineer for design of new facilities to support maintenance operations. New hangar is 28,000 SF with 13,200 SF in shop support areas and an administrative area. Hangar was connected to existing airfield taxiways with a new ramp to accommodate aircraft traffic. Designed to include an under hung bridge crane to facilitate the removal of aircraft engines and other maintenance functions. The facility was designed to include a paint booth.

NASA Building 4705 Precision Cleaning Facility Marshall Space Flight Center, AL
Mechanical Engineer: Comprehensive HVAC and process upgrade to existing 4200 SF class 100,000 clean room facility used for cleaning of various mechanical and electrical components.

NASA Advanced Propulsion Research Facility Marshall Space Flight Center, AL
Mechanical Engineer: Provided comprehensive HVAC upgrades to the 35000 SF building, including new chilled water, hot water, and air handling systems.

Textron Aerostructures (formerly Avco)
Nashville, TN
Mechanical Engineer: Concept study of alternative air conditioning systems for Building 38.

Detrex Corp.
Franklin, KY
Industrial Team Manager/Project Manager: Development of process concept and design of specialty machine to clean the interior and exterior of various diameter configurations and lengths of tubing to be used for the life support systems to be installed in the Space Station Freedom under development by Boeing. Services included design of machine enclosure, access door with air-activated lifting mechanism, flush and wash tank and pump systems, all piping and valving, instrumentation and controls, electrical power and interior lighting, and environmental system to maintain 100K "clean room" environmental within the machine. Also developed general arrangement drawings for operation station, control systems, hydrostatic test system (to 6000 psig test pressure) and Deionized Water System.

Carpenter Wright Engineers
Structural

Client
Covenant Building Systems

AH-64 Helicopter Hangar
Fort Rucker, AL

CWE provided structural design of the three 240 foot long box trusses and support trusses for the mega-doors for the military helicopter hangar, and the roof trusses and support columns for the juncture of the curved roof girders at the building height transition. Each box truss was designed for two spans of 120 foot each. The area of the helicopter hangar was approximately 80,000 SF. The facility includes numerous under-hung frames to service the aircraft.

Carpenter Wright Engineers
Structural

Client
Covenant Building Systems

Airbus Operations
FAL Hangar, Service Building, and Office Building
Mobile, AL

Structural design of the approximately 210,000 SF final assembly line hangar (FAL) for Airbus. Scope includes crane runway framing, building frames, laced columns, wind columns, roof framing, catwalk framing, roof bracing, and vertical bracing. Scope included structural design of the two story service building with four HVAC galleries and one four story office area for Airbus. The service building runs along side almost the entire length of the FAL Hangar. The structural system consists of steel moment frames in both directions supported with wide flange columns. The eave height of the main structured was 83 feet, and the building was designed for a wind speed of 141 mph (ASCE 7-05). The clear span of the curved roof was 245 feet.

Carpenter Wright Engineers
Structural

Client
Covenant Building Systems

VT Mobile Aerospace Engineering
MRO Hangar
Pensacola, FL

CWE designed the two-span box truss structure to support the pre-engineering building frames to construct a 530,000 SF aircraft maintenance and repair hangar at the Pensacola International Airport. The box truss was approximately 27 feet deep, and was designed for 2 spans of approximately 300 feet each. At the mid-span of each of the 300 foot spans, a notch in the bottom of the box truss was created for the tail of an aircraft. The clear height under the box truss was 51 feet.

Carpenter Wright Engineers
Structural

Client
Covenant Steel

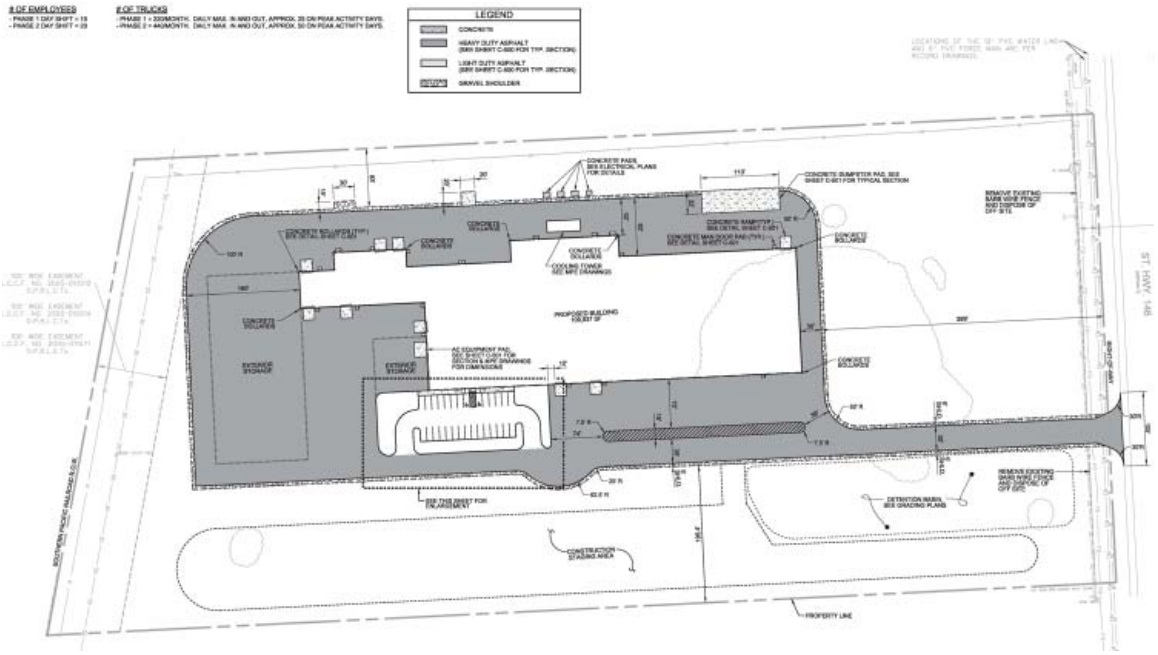
Contractor
Burns & McDonnell

West Virginia Air National Guard
C-5 Corrosion Control Hangar
Martinsburg, WV

Carpenter Wright Engineers provided the structural design for the approximately 80,000 square feet C-5 Corrosion Control Hangar facility. The corrosion control hangar facility consists of a high hangar bay for a C-5 aircraft and a lower bay for maintenance shops.

The high bay structure includes articulated long-span steel truss frames with tapered building columns. The roof steps up over the center section of the aircraft to maintain the required clearances and have a curved roof shape above the tail and fuselage area of the C-5 aircraft. The frames at the front of the hangar are designed to support a fabric type hangar door. The typical span of the steel truss frames is 296 feet.

Sumiden Wire Products Corporation
Manufacturing Facility
Dayton, TX



Design Innovation Architects
Architect

I. C. Thomasson Associates, Inc.
Mechanical, Electrical, Plumbing and Fire Protection

Carpenter Wright Engineers
Structural

James + Associates
Site/Civil

The TIS team provided full planning and design services, including architectural, site/civil, structural, mechanical, electrical, plumbing and fire protection design services for a new 115,000 SF light manufacturing (pickling, drawing, stranding of structural wire) and warehouse facility with interior office and employee amenities area. The construction is a Pre-Engineered Metal Building (PEMB) structure.

The project is located on approximately 22 acres and includes paved areas for the Rod Storage Yard (raw materials) and Rod Unloading/ Pickling area, the shipping and receiving dock areas, traffic aisles, new access bridge and road, and employee/visitor parking lot.

Kobalt
Can Manufacturing Facility
Roanoke, VA

I. C. Thomasson Associates, Inc.
Mechanical, Plumbing, Fire Protection and Electrical Design

Carpenter Wright Engineers
Structural

The renovation of an existing 530,000 SF building on an industrial site included improvements for use as a food-grade steel can stamping, manufacturing and warehouse operation.

TIS provided structural, mechanical (HVAC), electrical power and lighting, low-voltage (rough-in) systems, fire protection and piping / plumbing design engineering services.

The structural scope of work included design and construction documents for the new 75,000 SF mezzanine, incorporation of new mezzanine into existing building structure for lateral resistance, localized reinforcement of existing roof structure for new heavy duct and process piping loads, and the process equipment foundations and trenches.

Mechanical work includes HVAC / Plumbing design for office and support areas for comfort air conditioning and heating and ventilation including building pressurization control in manufacturing, hazardous storage, and warehouse areas and containment for tank filling and storage.

Fire Protection work included the design of a sprinkler system for the manufacturing area and palletized storage and a wet pipe foam fire suppression system for hazardous storage.

Electrical work includes upgrade to the site electrical service (working in coordination with the local utility provider), site lighting and interior lighting upgrades, general building power, and power for HVAC equipment.

Post-Design phase services included shop drawings and submittals reviews and construction observation services.

Where We Have Worked

Thomasson Industrial Services

Thomasson
Industrial Services


Integrated Steel Design and Delivery
3D / Building & Process Modeling of Process Equipment
Unique Team Capabilities
In-house Industrial Systems Engineering
Life Safety Code Analysis / Fire Protection

3D / Building & Process Modeling

Building Information Modeling

Software Platforms

- Revit
- CAD Works
- Navis Works

Benefits

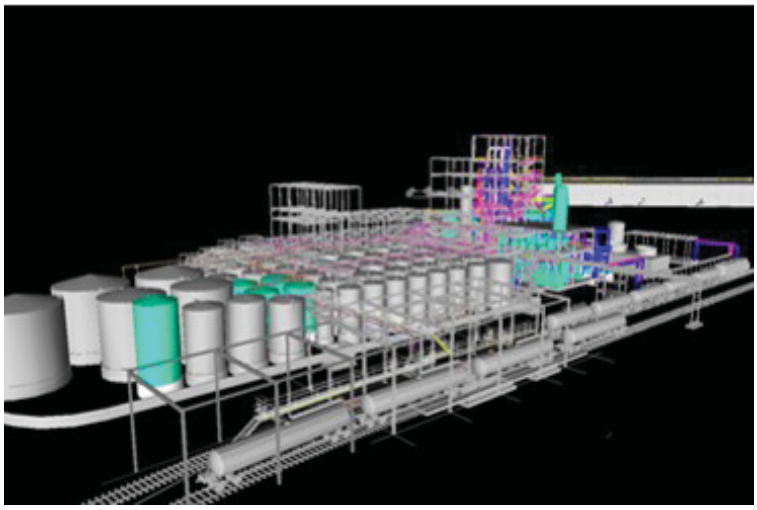
- Coordination
- Clash Detection

Construction Aids

- Spool Piece Drawings
- Bill of Materials

Refinery Expansion

Bunge North America, Decatur, AL



I. C. Thomasson Associates, Inc.

Life Safety Code Analysis / Fire Protection

Life Safety Codes Analysis

Means of Egress

Fire Protection

- Protection Analysis
- Design Management
- Fire Science Human Behavior
- Explosion Protection & Prevention

Thomasson
Industrial Services

Industrial Systems Engineering

Facilities Planning & Layout

Work Cell / Station Design

Automation

Warehouse Optimization

- Racking Design and Layout
- Floor Space Maximization
- Logistics
- Inventory Planning and Capacity Studies

Operations Research & Simulation Modeling

Process Design and Optimization

Preventative Maintenance

Ergonomics & Safety

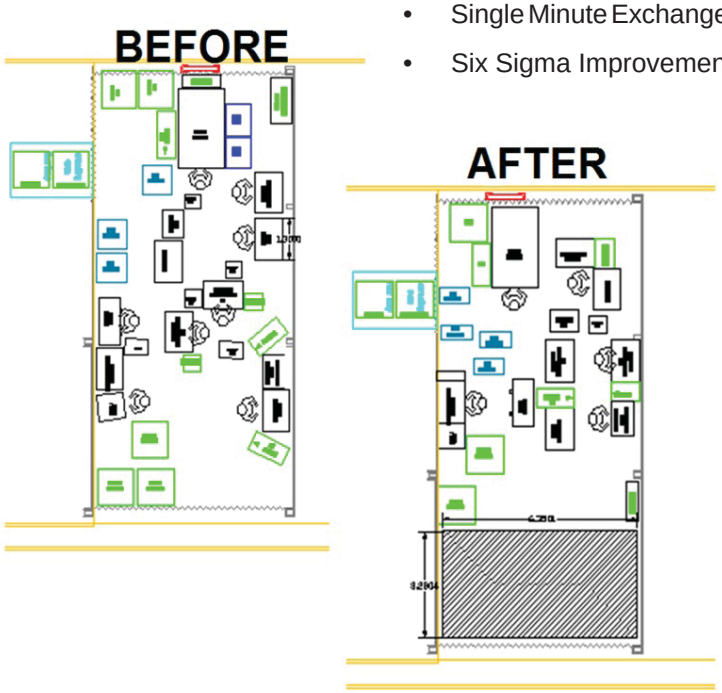
Time Studies / Methods Analysis

Value Added Engineering

Cost / Benefit Analysis

Continuous Improvement

- Cost and Cash Flow Improvements
- Error Proofing (Poke Yoke)
- Just-In-Time Inventory Systems (JIT)
- Lean Construction & Design
- Material Flow Analysis
- Process Improvement
- Model Determination
- Pull Production System (Kanban)
- Single Minute Exchange of Dies
- Six Sigma Improvements



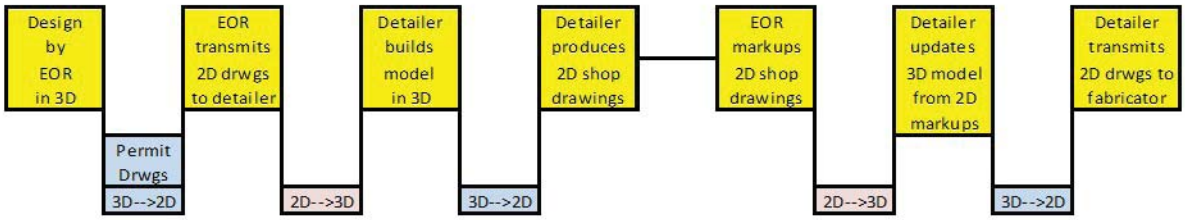
Thomasson
Industrial Services

Integrated Steel Design and Delivery

- CWE builds the 3D BIM model to use in analysis and design of structure.
- As sections of the structure are completed, the BIM model is shared with our steel detailing partner and imported into Tekla Structures.
- Review of steel detailing is expedited using on-screen review available to the entire team (Owner, General Contractors or CM's, Sub-Contractors, Erector, Architect and Engineers).
- Eliminates multiple printings of the 2D drawings for review. Usually only printed for submission for Permit, and final record drawings.
- Connection design for both erection transfer forces and final forces performed by both CWE and detailing partner.
- Erection sheets (E-Sheets) and detail sheets produced by detailing partner are stamped by EOR (CWE), and submitted for permitting.
- Steel detailing services can also include material lists, material tracking, CNC coding, fabrication shop and jobsite observations, and steel brokerage

Flow Chart of 2D/3D Conversions

Conventional Delivery:



Collaborative Delivery: