Composite Wood Product Solutions

Stantec is an industry leader in the planning engineering and integration of composite wood product manufacturing facilities, including oriented strand board (OSB), medium-density fiberboard (MDF), and wood fuel pellet plants. Stantec (NGM International) has a long history in the industry which began in the pioneering days of waferboard, the predecessor of OSB.

With over 30 years experience in the wood composite industry and over 45 years in the power, utilities, and pulp industries, Stantec brings a unique combination of Oriented Strand Board (OSB) specific process knowledge and peripheral industry practices. Our experience with Greenfield projects as well as capacity upgrades/ modification projects in existing facilities allows us to fully understand the requirements for successful projects. Stantec offers experienced project managers, designers, site supervisors, and start-up personnel.

The value of Stantec’s core values and experienced design team in understood by our clients, as evident by an impressive record of repeat business.
Stantec strives for excellence, consistency, and efficiency in our projects. We have a comprehensive portfolio of Mass Balance, Process Flow, General Arrangement and Balance of Plant design to support the manufacturing processes for diverse product lines including oriented strand lumber (OSL), OSB, MDF and wood pellets. Our experienced process, civil, electrical controls and mechanical engineers offer a full array of design services and can provide complete engineering including equipment specification and integration.

The following is a representative list of services provided by Stantec to our customers in the Composite Panel Products Industry.

**Project Support Services**
- Scheduling
- Estimating
- Technical Procurement
- Training Materials
- Documentation

**Construction Management**
- Budgeting and Cost Estimating
- Reporting
- Supplier Coordination
- Scheduling

**Mechanical and Process**
- Process Studies and Economic Analysis
- Process Flow Diagrams
- Equipment and Facilities Layouts
- Equipment Specification
- Process Modeling (Mass and Energy Balances)
- Fiber Utilization Studies
- Cogeneration Systems
- Mill Capacity and Performance Upgrades
- Fines Recovery Systems
- Material Handling and Storage Systems
- Machine Design
- General Building Heating and Ventilating
- Electric Room/Test Lab/Control Room Air Systems
- High Temperature/Pressure and Chemical Piping Systems
- Fuel Transport Piping Systems (natural gas, propane, fuel oils)
- Plant/Potable Water Systems
- Air/Vacuum Piping Systems
- Pipe Stress Analysis and Support Design
- Pressure Vessel Design to ASME Codes
- Fire Protection System
- Steam Plant/Water Treatment
- Process Safety Management/Lockout Tagout
- Training/Start-up Support
Process Controls, Automation and Instrumentation
- OSB/MDF pellet plant equipment interpretation
- OSB/MDF Finishing Line Upgrades
- Log Handling
- Dust Collection Systems Integration
- Finishing Line Upgrades
- Dryer Control Systems
- Blending Control Systems
- Plant Information Systems
- Process Automation and Information Management
- PLC/Distributed Process Control Systems
- PLC Computer Programming
- Equipment Instrumentation Specifications

Civil and Structural
- Site Survey
- Civil/Sitework
- Building Structures/Foundations
- Equipment Foundations

Electrical
- Power System Modeling (short circuit/coordination analysis)
- Power System Quality Analysis and Design
- High Voltage Power Transmission Systems
- Vibration Monitoring Systems
- Main Power Output Systems (generator exciters, step up transformers)
- Station Service System (transformers, motor control centers and cabling)
- SCADA Systems
- Communications Systems
- Electrical System Protection
- Control and Metering Design
- Conventional and Gas-Insulated Substations
- Overhead/Underground Transmission Systems
- Overhead/Underground Distribution Systems

Environmental
- Pollution Abatement Controls
- Spill Containment Systems
- Environmental Testing/Monitoring
- Hazardous Waste Handling/Storage/Disposal
- Combustion Source Retrofits
- Environmental Assessments and Audits
- Permitting/Licensing/MACT Analysis
- Waste Management Planning
- Leachate Treatment Systems and Settling Ponds
- Site Remediation
- Hydrogeological Engineering
- Water Supply
- Contaminated Assessment
- Risk Assessment
- Recycling/Landfill Facilities
Relevant Experience

Design

Stantec is proud of our well-earned reputation in the composite wood product industry. We have a diverse and impressive listing of successful projects. Below is a representative list of projects:

**Wood Fuel Pellet Plant**

**140,000 MT/Y Wood Fuel Pellet Plant - Langboard Inc. - Quitman, Georgia**

Stantec developed dynamic mass balance scenarios, process flow diagrams and general arrangement equipment drawings for a new wood pellet plant to be located at the Langboard OSB plant in Quitman Georgia. Stantec prepared equipment vendor specification, and received and reviewed equipment vendor proposals. Once the process flow diagrams and equipment list were complete an AACE Class 3 capital cost estimate was developed.

Stantec reviewed the existing available equipment and infrastructure to analyze potential process equipment capital cost savings. Stantec also led discussions with potential wood pellet brokers and rail car shipping interests to assist Longboard in the project feasibility analysis.

**200,000 MT/Y Wood Pellet Plant – Confidential Client - Florida**

Owner’s engineer for a new wood pellet manufacturing facility in Florida, utilizing plantation grown Eucalyptus. Pellet plant to be built and operated in conjunction with a 63 MW biomass fired power plant.

**Wood Pellet Plant Process and Automation – Mactara Limited – Upper Musquoboit, NS**

Detailed electrical and controls engineering design for the wood pellet plant process line. Services included design power supply to the plant, building electrical services, power to process equipment control design, PLC system design, HMI graphic design, programming, and start-up. Stantec provided the process flow diagram for the plant and general start-up assistance.

**Enviva-Ruby Torrefaction Pellet Plant Study - TC Group Inc. - Martinville, Virginia**

Process engineering subconsulting services for a desktop study to develop the probable cost for a pilot plant project. Services included: 1) Reviewing available process information, studies, balances and vendor information; 2) provide a certified PHA leader (MFM) to lead a preliminary hazard review; 3) assist with identifying safe design features; 4) identify action items to be addressed in next study phase; and assist with identifying scope and project cost allowances for safe design features.

**30 TPH Wood Pellet Manufacturing Facility**

Reviewed technical drawings and financial applications for capital draws. The overall project included wood acceptance and size processing systems (hogging), conveyors, screening, plant dryer, and biomass burner for steam generation, hammermills, pellet mills, finish product screening, storage, control and instrumentation, and fire suppression systems.
Selection

Oriented Strand Board (OSB) and Lumber (OSL)

OSB to OSL Mill Conversion (250 mmsf/yr -3/8” Basis OSL) – Louisiana Pacific Corporation – Houlton, ME

Preliminary, detailed, and site engineering for process, mechanical, civil, structural, electrical, instrumentation, and controls for the process line and balance of plant. Special provisions for minimizing interruptions to the existing OSB operation and maximizing the utilization of existing OSB equipment and infrastructure within the project schedule were provided. Process design included modified log conditioning ponds, ring debarkers, modified strander knife packs, OSL bins, continuous press, and finishing line with OSL and OSB capabilities.

OSL Line Addition (650 mmsf/yr -3/8” Basis OSL) – Ainsworth Lumber Company – Grande Prairie, AB

Preliminary and detailed process, mechanical, civil, and structural engineering for process line and balance of plant. Mechanical construction site services were included for the integration of the new OSL line to the existing OSB plant. Special provisions for optimized fiber utilization for OSL/OSB products, green end retrofit, and plant layout were provided. Process design included a rail mounted grapple loader, ring debarkers, ring stranders, OSL bins, tubulator, belt and flight conveyors, six (6) head forming line, mat preheater, continuous high pressure press, and finishing line with OSL and OSB capabilities.

Mill Modernization and Cogeneration - Langboard, Inc. – Quitman, GA

Detailed electrical engineering design and construction supervision services to increase plant production from 240 to 460 MMSF. Services included control system design, PLC programming, HMI graphic design, power system design, and start-up. A unique aspect to this plant was the 15 MW cogeneration unit with Stantec serving as the administrator of power sales contract.

Mill Line Rebuild (467 mmsf/yr – 3/8” Basis OSB) – Tembec - Timmins, ON

Detailed multi-discipline engineering design and construction supervision services for the reconstruction of the fire damaged Malette OSB mill. Scope of work included setting up a remote engineering office, selection of equipment, detailed design, commissioning and start-up assistance, existing system improvements where necessary to improve the production capabilities, and fire resistance. Circumstances required construction throughout the Northern Ontario winter and involved several innovative approaches to facilitate constructability through the winter period.
Relevant Experience

Process

**Mill Capacity Upgrade - Huber Engineered Woods, LLC – Commerce, GA**
Overall process review study to establish capacity upgrade opportunities. Detailed design services included complete new log in-feed system, upgrades to flake storage and blending systems, as well as modifications to the forming line and press. Installation and commissioning were supported by Stantec construction management and technical site staff.

**Mill Capacity Upgrade - Huber Engineered Woods, LLC – Crystal Hill, VA**
Overall process review study to establish opportunities for increased capacity. Detailed design services included major upgrades to the log in-feed systems, dryer replacements, resin system upgrades, and modifications to the forming line. Stantec staff are contracted to provide future services for construction management and technical site support.

**Greenfield Mill (145 TPD OSB) - Highland Forest Products, PLC – Inverness, Scotland**
Preliminary engineering and detailed civil, structural, process, mechanical, and electrical engineering design and field services. The mill process line utilized a caullless forming line with an 8 opening 8’ x 16’ press. This was the first OSB mill constructed in the United Kingdom and was challenged with the ground work for proving product standards and gaining acceptance in the UK and Europe. The mill furnish was primarily Sitka Spruce and Scots Pine plantation thinnings.

**Greenfield Mill (400 mmsf/yr – 3/8” Basis OSB) - Saint Lawrence Forest Products – Ogdensburg, NY**
Preliminary engineering, conceptual design, and capital cost estimate for 480 mmsf/yr OSB mill to be constructed in Upstate New York. The preliminary design was developed into an Engineering, Procurement, Construction (EPC) bid document to solicit proposals from invited EPC contractors to deliver the specified mill.

**Waferboard to OSB Mill Conversion (313 mmsf/yr – 3/8” Basis OSB) - Eagle Forest Products Limited Partnership – Miramichi, NB**
Preliminary engineering and detailed civil, structural, process, mechanical, and electrical engineering design associated with the OSB process line and balance-of-plant. The project site contained an existing waferboard process line which was dismantled and the site recycled with the building infrastructure retrofitted to accommodate the new process line. A unique aspect of this project was the preparation of the press platens for future addition of steam injection. Benefits of degassing times were quickly appreciated from the use of vented platens which commenced a trend for future multi-opening press process lines.
Structural

**Triple Pass Dryer Replacement – Louisiana-Pacific Corporation – Houlton, ME**
Electrical engineering for replacement of two existing triple pass dryers with new single pass dryers. Completed capital cost estimate, electrical design, installation specifications, contractor supervision, PLC programming, and commissioning.

**Process Water Management Project – Weyerhaeuser OSB Division – Miramichi, NB**
Process and mechanical design, then project management and construction supervision services to install a system which balances seasonal surplus/shortage of process water in the Hot Ponds. Stantec managed the electrical design which was performed by a remote office of the client’s engineering division.

**Forming Line Modernization - Louisiana Pacific Corporation – Baileyville, ME**
Conceptual design and capital cost estimate for approval of the forming line upgrade including DC drive conversion at the OSB Mill. During the detailed design phase, Stantec selected the appropriate equipment, designed the control system and interconnections, and developed software and graphics for the new control system. Final installation was completed during a short scheduled shutdown. Stantec assisted with commissioning and start-up of the new control system.

**Forming Line Control System Upgrade - Langboard, Inc. – Quitman, GA**
Conceptual design and capital cost estimate for approval of the forming line upgrade including DC drive conversion. During the detailed design phase, Stantec selected the appropriate equipment, designed the control system and interconnections, and developed software for segments of the process control. Final installation was completed during a short scheduled shutdown. Stantec assisted with commissioning and start-up of the new control system.

**Finishing Line Engineering Services - Martco Partnership – Alexandria, LA**
Preliminary and detailed engineering including conceptual design and capital cost estimating for the upgrade of the finishing line. Requirements were clearly defined with a process flow diagram indicating product rate, piece count, terminal points between the existing process equipment, and new equipment forming the basis for the HMI and PLC programming. Assistance in the vendor selection process was also included.
Relevant Experience

Sander Line Replacement - Georgia-Pacific Corporation – Vienna, GA
Preliminary and detailed engineering for the installation of a new sanding line at the existing particleboard mill. The installation was integrated with the existing finishing end in a manner that enabled construction to be completed with the least amount of disruption to the current operation. Services included assistance in vendor selections, general arrangement drawings, design of foundations, miscellaneous steel, electric power distribution, and controls interface.

Medium Density Fiberboard (MDF) and Particleboard

Raw Material Storage and Refining Capacity Expansion - Flakeboard Company Limited – St. Stephen, NB
Conceptual design and layouts for an enclosed raw material storage and reclaim system. Prepared Engineering, Procurement, and Construction (EPC) bid document to solicit proposals from invited EPC contractors to deliver the specified raw material storage and handling system. Provided detailed engineering for balance-of-plant associated with the installation of a new MDF refiner and fiber flash tube dryer for Flakeboard’s Fibrex II MDF line.

Stantec specified materials and equipment, prepared and administered installation contracts, supervised on-site construction, provided start-up assistance.

MDF Production Line Addition (MDF 3) - CSC Forest Products Ltd. – Cowie, Scotland
Stantec worked in a project management role as an extension to the CSC Forest Products Ltd. project team for coordination of the design and construction activities of an 800 M3/day MDF process line. The new process line was constructed on an existing manufacturing site that consisted of two MDF and two particleboard process lines. MDF 3 process line literally wrapped around the perimeter of the existing operating infrastructure. Stantec commenced at the equipment procurement stage, coordinating system scope negotiations with vendors, completing bid evaluations, order confirmations, and recommendations to purchase as appropriate. Detailed plant layouts were completed by system equipment vendors and the interface with the existing site and miscellaneous equipment vendors was completed by Stantec. The project incorporated the latest technology available for chip washing and refining systems, continuous press and book cut-to-size finishing end. A unique aspect of this system was the integration of a 13 MW gas fired turbine cogeneration set used as the thermal energy source for the single stage MDF fibre flash tube dryer.
Detailed

Miscellaneous Wood Products

Molded Pallet Plant - Acuma Presswood Pallet Inc. – Grand Falls, NB
Detailed civil, structural, mechanical, and electrical engineering design and field services for construction of 1,600,000 pallets/year molded pallet manufacturing plant. The pallet process line was supplied by Werzalit from Germany. The press was an 8 mold single opening press. The process furnish was mixed northern hardwood and softwood reduced to particle sized material.

Cogeneration

12MW CoGen Unit - Langboard Inc. – Quitman, GA
Stantec was contracted by Langboard Inc. to provide mechanical, electrical, controls, and instrumentation engineering design and technical assistance relocated for repowering a refurbished 12 MW turbine/generator unit. The steam is generated by a Heat Recovery Steam Generator (HRSG), which has been integrated into the OSB plant’s heat energy system. Stantec, in conjunction with Siemens, provided initial evaluation of the used turbine/generator unit and the equipment for its Balance of Plant (BOP) and assessed the extent of refurbishment and/or replacement required.

Project activities included an audit of all existing devices and identified whether they will be reused or replaced by new ones; preparation of engineering design and procurement specifications for new devices and piping systems; preparation of engineering design for MCC, power distribution, generator protection, and switchgear; configuration, programming, and commissioning of the new PLC control systems for BOP and Water Treatment Plant, as well as providing construction support and as-built drawings.

Gypsum Board

Gypsum Fibreboard Plant - Highland American of Rhode Island, Inc. – East Providence, RI
Engineering services to support the development an engineer, procure, and construct (EPC) project at a Gypsum Fibreboard Plant to Highland American of Rhode Island. Detailed balance-of-plant design engineering and field support services were provided to Marshall Contractors, the EPC vendor. Coordination with Wurtex Maschinenbau Hofmann GmbH was completed for design and supply of the process line. The gypsum fibreboard plant process was based on European technology and the first of its kind in North America.

Gypsum Wallboard Plant (400 mmsf/yr) – Atlantic Wallboard Limited – Saint John, NB
Project management, preliminary, detailed, and site engineering for mechanical, civil, structural, electrical, instrumentation, and controls for the balance of plant. Coordination with Gypsum Technologies Inc. of Canada was completed for design and supply of the process line.
Relevant Experience

Concept

Cogeneration Plant – Confidential Client – NB
Detailed design and capital cost estimate for a wood fired cogeneration facility. The cogeneration plant was designed to produce a nominal 20 MW electrical output and 250,000 PPH steam for process purposes. The study involved a boiler to fire primarily on biomass fuel with supplemental firing on No. 6 heavy fuel oil, waste oil, sludge and natural gas, back pressure turbine generator, and biomass handling system, comprised of truck dumper/weigh scale and conveyors. The study also included a complete electrical station service system and distributed control system.

Courtney Bay Generating Station – Confidential Client – Saint John, NB
Detailed design and capital cost estimate for a wood fired cogeneration facility located in the existing New Brunswick Power Courtney Bay Generating Station. The cogeneration plant was designed to produce a nominal 20 MW electrical output and 200,000 PPH steam for process purposes. The study involved the demolition of an existing oil fired boiler and turbine generator and installation of a new biomass/natural gas fired boiler, turbine generator, and biomass storage and conveying system, comprised of truck dumper/weigh scale, covered storage, and conveyors. The study also included a complete electrical station service system and distributed control system.

up burner, and other required piping systems. Stantec has specified the new DCS, the electrical switchgear, and MCC’s; completed the power system analysis; and prepared the electrical and instrumentation design.
To master efficiency is to continuously improve. We help industrial wood-product communities improve their operations through facility design. Using space more effectively, reducing costs, and optimizing production flows – are at the cornerstone of our design approach. We design spaces that increase productivity levels, provide quality products, and drive success in the face of a competitive global market.
Design with community in mind

We’re active members of the communities we serve. That’s why at Stantec, we always design with community in mind.

The Stantec community unites more than 13,000 specialists working in over 200 locations. We collaborate across disciplines and industries to make buildings, infrastructure, and energy and resource projects happen. Our work—professional consulting in planning, engineering, architecture, interior design, landscape architecture, surveying, environmental sciences, project management, and project economics—begins at the intersection of community, creativity, and client relationships.

Since 1954, our local strength, knowledge, and relationships, coupled with our world-class expertise, have allowed us to go anywhere to meet our clients’ needs in more creative and personalized ways. With a long-term commitment to the people and places we serve, Stantec has the unique ability to connect to projects on a personal level and advance the quality of life in communities across the globe. Stantec trades on the TSX and the NYSE under the symbol STN.