

# Does Your Brewery Project Have You Puzzled?



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Process Solutions

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*A Christian based company dedicated  
to the Beverage Industry.*



## Service Offerings Review:

*Providence Process Solutions currently offers services in a three phase logically oriented manner. Phase I Financials, Phase II Process Design, and Phase III Project Management support a variety of services as listed below.*

**Phase I – Financials** – Prior to soliciting funds from private investors, banks, or other shareholders, it is critical that all plant design / build costs are properly defined and a 5-Year balance sheet is created to make sure your future cash flow can service your debt safely. Providence Process Solutions has created a complete set of General Accepted Accounting Principles, (GAAP), compliant financials for dozens of craft breweries which have streamlined the procurement of finances for their projects including Small Business Administration, (SBA), backed loans. A complete set of financials includes the following documents:

- **Process Equipment Negotiations**, – Providence Process Solutions has developed strong relationships with dozens of top rated process equipment and equipment installation service suppliers that benefits the beverage manufacturer in many ways. Very competitive pricing based on a variety of offerings per machine category, limited to zero change orders, on-time delivery assurance, machine performance verification, reliable start-up and training validation, and machine to machine interoperability conformance. Custom terms are also negotiated through Providence Process Solutions. Please review Providence Process Solutions' list of preferred suppliers at [www.prov-ps.com](http://www.prov-ps.com) for more information.

- **Process Equipment Contract Administration**, – Once all contracts have been signed, Providence Process Solutions works closely with all process equipment vendors, bank loan facilitators, and the beverage plant's financial manager in coordinating the procurement, review and submittal of all vendor invoices to ensure they meet the original terms and conditions established in the vendor contract. Beverage plant owners can be confident that they are paying in a manner that is congruent with their financial plan and vendors can be assured that they are being paid according to their pre-negotiated terms and conditions. No surprises equates to a smoother project flow with less stress for all parties.

- **Project Cost Schedule Development**, – This spreadsheet is broken down into three categories including facility construction costs, professional engineering services costs, and process equipment procurement and installation costs including equipment, shipping, rigging, electrical, process piping, and training / start-up. Vendor contact information, approved budget vs actual costs with variance per equipment or service item and bank draft value vs date are all tracked in this "live" document. The Project Cost Schedule is the foundational cost schedule for multiple other financial documents and also sets the financial cost goals by which Providence Process Solutions' Phase III – Project Management must follow as well as the foundational document for Providence Process Solutions' process equipment contract administration service. Note: Facility building cost data is procured through the beverage plant's local general contractor, but then compared to other GC rates across the country based on dozens of prior beverage plant project cost schedule designs.

- **5 Year Labor Cost Schedule**, – This spreadsheet defines current and 5 Year anticipated labor requirements for the entire beverage plant enterprise including operations, sales, admin, and senior management. Annual salary income and

additional hires based on forecasted growth are all calculated in this document which is then linked to the 5 Year income schedule. Industry salary averages are compared to local rates to assure employees are paid in a manner that reduces employee turn-over.

- **Break-Even Analysis**, – This spreadsheet calculates a beverage plants break-even volume based on data uploaded from the production cost spreadsheet, and sales splits by packaged products including bottles, cans, and kegs. This document also serves as a template by which several "what-if" scenarios can be evaluated for optimized profitability.

- **Production Cost Analysis**, – This spreadsheet evaluates all ingredient costs per batch of beer for 5 beer brands, packaging costs for bottles, cans and kegs, and utility costs including water, sewer, electric, Co2, and natural gas. This spreadsheet is used to calculate break-even values, and is also linked to the 5 Year Income Schedule.

- **5 Year Forecast**, - This is also a foundational document and is required to calculate revenue for 5 key product brands by packaging format percentage so that production costs can be determined. Data from this document is then linked to the 5 Year Income Schedule. This powerful tool can be used to calculate the overall financial impact associated with quick and simple changes to the forecasted volumes per brand and packaging type.

- **5 Year Balance Sheet**, – This document is an essential part of any set of GAAP approved financials and includes a listing of current and fixed assets, capitalized expenses, short and long term liabilities and equity over 5 Years. This document requires data from the Project Cost Schedule in order to properly calculate net equity and liabilities.

- **Source & Use**, – This simple document defines how funds are procured and used over a 5 Year period and demonstrates fiscal responsibility and net cash viability.

- **5 Year Income**, – This GAAP standard document includes sales projections from beverage sales via multiple venues, tasting room food sales and store apparel sales, cost of good sold for each sales revenue category, margin calculations, chart of account based operations costs, other income sources, taxes and net cash from operations totals for 5 years. This document requires data from almost every other document on the financial workbook as listed above. The chart of accounts categories and industry averages are compared to the local beverage plant's data to see how well they are performing. This has proven to be a positive means by which cost containment efforts can be more profitably focused upon.

- **Loan Portfolio**, – This document is a simple spreadsheet that defines all loans with associated values, interest rates, terms and monthly payments by principal and interest over 5 Years. Data from this document is used in the 5 Year income schedule.

- **Depreciation Schedule**, – This document defines how a beverage plant may depreciate their building, capitalized professional engineering services and process equipment over 5 Years. Data from this document is used in the 5 Year income schedule.

- **Shareholder Presentation**, – Once the set of financials has been completed, the accrued financial data is incorporated into this shareholder's presentation which is then used to explain the business case for requested funding in a clear and professional manner using Microsoft PowerPoint. Key financial data, examples of key process equipment, forecasting assumptions and costing explanations are all included in this presentation.

**Phase II – Facility and Process Design** – Many beverage plant owners can become quickly overwhelmed when trying to navigate through hundreds of technical facility and process equipment technologies that can range from building architecture, civil engineering, structural engineering, seismic engineering and local compliance, facility mechanical HVAC, plumbing and electrical design, I.T. infrastructure, process water, sewer, gas and electrical requirements, plant equipment selections and layout, process automation design, grain handling system design, packaging equipment systems design, filtration and pasteurization system design, process piping design, boiler, chiller, compressor, cooler designs, tasting room and kitchen bar designs, process equipment selections, custom platform design and fabrication, brewhouse design, batch management systems, ERP / MRP design, and the list goes on and on. Many wonderful engineering firms specialize in each one of these professional engineering services, but it is up to the beverage plant owner to coordinate each of these services in a logical and cost savings manner. Providence Process Solutions provides an enterprise wide design / build management portfolio of services that can organize and integrate all of these professional engineering disciplines into one optimized plan where each professional engineering service is tightly woven into the fabric of a final solution that aligns with the beverage plant owner's key business operational and financial objectives. A facility design needs to support the operations processes incorporated within the facility. Providence Process Solutions defines all facility requirements while working closely with the beverage plant owner's senior management team. These requirements are then incorporated into a series of facility specifications which are then presented to Providence Process Solutions' preferred engineering partners or local firms whom may already be involved with the beverage plant project. Providence Process Solutions' Phase II design program can take on many forms and support a variety of budgets depending on the beverage plant's shareholder requirements. Many typical services associated with Phase II are outlined below. However, custom plans and pricing can be provided on a plant by plant basis.

#### **Front Office Engineering System Services:**

- **Forecasting**, – As a beverage plant grows, accurate forecasting plays an ever increasing role in the success of an operation. Proper forecasting plays heavily in financial decisions on future capital expenses, forward ingredient contracts, inventory management, and production scheduling. There are several great forecasting products available on the market today that incorporate a variety of customizable algorithms. Understanding which product to use in alignment with a beverage plant's order history, distribution constraints, and promotions plans along with new product releases is considered a critical business success factor. Providence Process Solutions can assist a beverage plant in understanding all these factors and select the most effective solution for each facility's specific sales environment.

- **Orders Management**, – Selecting an effective order's management software package requires specific attention to how a beverage plant may want to integrate a business intelligence software solution in addition to the basic mechanics of entering an order. Special promotions pricing, matrix pricing, customer discount volumes, rebates, customer credit, customer notes, sales by region, sales person, customer, distributor reporting are just among some of the many functions that must be considered when selecting an effective orders management software package. Providence Process Solutions can help you navigate through these questions and assist in selecting the right package for a beverage plant's specific sales environment.

- **Production Management**, – What does it really cost to manufacture your beverage product? Are there more profitable products than others? Do you struggle with understanding how to set up bill of materials or make / use records? Are you comfortable with your production loss reporting system? Does your production scheduling system consist of a large white board and colored marker pens? If you struggle with these questions and more, perhaps you might benefit from Providence Process Solutions' Production Management systems audit and automated solutions recommendation.

- **Inventory Management**, – Many beverage plants spend large amounts of time trying to manage their inventory on a regular basis only to find excessive amount of expired products, missing products, excessive material usages that do not align with finished goods postings, and over handling of inventory. Lot tracking is another quickly rising concern for possible product recalls. Associating Q.A. test data with specific lots has also become important as beverage companies compete for ever decreasing shelf space at their retailers. Still others are incorporating bar code systems into their inventory management systems for easier tracking, FIFO management and material handling tasks. Providence Process Solutions can help you better understand how today's inventory management software and tracking technologies can assist you in streamlining your inventory management activities.

- **Distribution Management**, – Distribution management typically supports a variety of order picking, truck loading, and delivery tasks. Customer returns, route / stop optimization and even direct truck sales are among the many factors that must be considered when selecting an effective distribution management software package. Providence Process Solutions' distribution analysis program can be used to define the right solution for your operations.

- **Financials Management**, – Accounts Payable, Accounts Receivable, General Ledger, Purchase Order, Fixed Assets, Bank Reconciliation, and HR are considered the primary elements which comprise an effective financials management software solution. However, many beverage plants today are looking at increasing these fundamental services with a more integrated approach that includes production costing on a lot by lot make / use basis for more accurate and immediate reporting on overall production efficiency. Understanding how to set up SQL databases and what data is really required and to get this information is part of Providence Process Solutions' Financial Management systems design service.

- **Business Intelligence Lean-Sigma**, – Business Intelligence, (B.I.), is exploding in popularity today based on the ever increasing acceptance of Lean Manufacturing and Six Sigma process improvement programs. You cannot fix what you cannot track effectively is a key phrase often used in the B.I. industry. Providence Process Solutions has effectively audited and identified inefficiencies using Lean-Sigma technologies for over 2 decades and can provide these same services in an extraordinary manner to beverage plant owners based on Providence Process Solutions' in-depth knowledge of how to design and build enterprise wide beverage plant facilities. This in-depth on-site audit and training program can take many forms based on the size and complexity of each operation ranging from plant efficiency audits to Lean-Sigma training to fully integrated B.I. Software – Lean Sigma custom plant designs.

- **I.T. Infrastructure - Security**, – The backbone of any successful enterprise wide business software solution is the I.T. Infrastructure. Defining what size server, anti-virus protection, firewalls, cloud based software integrations, video security, employee security passes with integrated door locks, fire alarm systems, hot back-up, uninterruptable power supply, (UPS), workstation drop topology, I.T. closet sizing, Internet access, wireless access points are all factors that need to be considered as part of an effective I.T. Solution. Providence Process Solutions can help a beverage plant navigate through all these critical decisions then provide a solution via Providence Process Solutions' preferred partner network.

- **Office Layout, (See Facility Designs)** – This service is part of a complete facility layout plan and includes all offices, conference rooms, reception areas, bathrooms, breakrooms, hallways, custom lighting, automated conference room audio – video – lighting systems, senior management offices with private bathrooms, office supply rooms, copy centers, and special events rooms.

## **Production Process Engineered Systems Services:**

### **• Primary Process Services:**

**o Malt Handling Systems** – Enterprise Brew, – Providence Process Solutions' malt handling solution consists of both a pre-designed automated malt room control panel that controls a malt mill's various motors, an integrated weigh scale, manual malt and adjunct additions, grain conveyance systems, and bulk grain silo / super sack slide gates. This solution also monitors the malt levels in each bulk grain silo and super sack system and is programmed via an operator keypad mounted in the door of the enclosure. A complete malt handling room system design includes:

- Grain conveyance systems and slide gate designs.
- Automated batch control grain feeding control panels.
- Bulk grain silo and "super sack" gantry style selections.
- Malt cleaning, bag break station and grist hopper designs.
- Malt mill selection. Wet or dry mill. Single or multiple roller sets.
- Malt room equipment vendor contract negotiations and procurement.
- Custom platform designs and malt equipment layout drawings in AutoCAD.

**o Brewhouse Systems Design** – Enterprise Brew brewhouse automation supports 2-4 brewhouse tank systems and incorporates Rockwell Automation PLC's with Wonderware server based human machine interface systems in Stainless steel industrial NEMA 4X enclosures. This batch based solution incorporates all brewhouse pumps, valves and instruments in a recipe based manner, where times, temps, flow rates, agitation, and other various control elements are sequenced according to each brew master's unique requirements. Hundreds of recipes can be created and operated either on-deck or in a control room or even on an iPad / iPhone with proper security clearance. This system can be incorporated on any brewhouse manufacturer's brewing system in either a new installation or retrofit manner.

**o Cellar Systems Design** – Enterprise Brew, – Enterprise Brew cellar control can either be incorporated into the Enterprise Brew Brewhouse Automation system or as a non-server based stand-alone system. In a stand-alone system, the cellar control panel will include an electronic human machine operator interface panel. In both cases, fermentation and conditioning recipes can be loaded that include multiple time / temp control steps. This solution measures tank temperature and control's glycol valves of each tank.

**o Product Filtration Systems Designs,** – This engineering service includes interviewing the beverage plant manufacturer for filtration requirement specification creation, then includes engineering the most efficient solution. Solutions can include DE/Filtration, Centrifuges, Membrane Systems, (R/O, Nano-filtration). A complete design also includes all equipment utility verifications, (Co2, Water, Compressed Air, Product, and Electric). Final system designs include equipment negotiations and equipment layouts in AutoCAD.

**o Pasteurizer System Designs,** – This engineering service includes interviewing the beverage plant manufacturer for pasteurization / heat treatment requirement specification creation, then includes engineering the most efficient solution. Solutions can include single / double triple pass skidded systems. A complete design also includes all equipment utility verifications, (Co2, Water, Compressed Air, Product, Electric, Steam, Glycol / Chilled water). Final system designs include equipment negotiations and equipment layouts in AutoCAD.

**o Clean In Place, (CIP Skids),** - This engineering service includes interviewing the beverage plant manufacturer for equipment sanitation requirement specification creation, then includes engineering the most efficient solution. Solutions can include 1, 2, 3 and 4 tank skidded systems with either semi-automation or full automation based on CIP recipes. A complete design also includes all equipment utility verifications, (Water, Electric, Steam). A more detailed design can also include discussions with your chemical supplier on proper dosing levels and dosing pumps, along with CIP temps and times and stainless piping systems for both supply and CIP return lines. Final system designs include equipment negotiations and equipment layouts in AutoCAD.

**o Packaging Systems Design** – Providence Process Solutions has designed and installed many packaging lines that support a wide variety of beverage products over the past 30 years including craft beer, distilled spirits, dairy liquids, and other beverage types. These system designs all begin with a customer interview, where key performance data like line speeds, packaging media, oxygen pick-up, carbonation levels, fill height verification, seam and seal integrity, CIP, floor space, utility requirements and other key design elements are all discussed. Providence Process Solutions then incorporates this data into a packaging line design specification which is then converted into a complete packaging line equipment layout drawing and vendor equipment specification. Contracts are then negotiated and budgets are set along with a project schedule. Key packaging line design equipment selection considerations include:

**o Bottling Lines,** – Depalitzers, accumulation conveyors, bottle labelers, Label date code printers, bottle pre-fill washers, bottle fillers, bottle crowners or twist on cappers, post fill rinsers, fill height instruments, transport conveyors, conveyor automation, carrier and case erectors, carrier fillers, case packers, case date coders, case palletizers, conveyor lubrication systems, etc.

**o Canning Lines,** – Depalitzers, accumulation conveyors, can date code printers, bottle pre-fill washers (deionized air or sanitized water), can fillers, can seamers, post fill rinsers, post fill dryers, can inspection instruments, transport conveyors, conveyor automation, can ringers, carton erectors – fillers, tray formers and fillers, case date coders, case palletizers, etc.

**o Kegging Lines,** – Kegging lines are much less complicated than bottling and can lines and consists of either manual or semi-automated one and two station keg washer / fillers. Highly automated rotary keg fillers are also available as a possible design solution.

**o Platform Designs,** – Many can lines and some bottling lines may require multi-level working platforms as part of the system design. Providence Process Solutions offers this custom platform design and fabrication project management service by working with each equipment supplier to make sure all product transfer point elevations are strictly adhered to. Platform designs are modular in nature and can be constructed out of mild steel or stainless steel.

**o Cooler Systems Design,** – Most beverage manufacturers typically require their finished product be stored in large product coolers or in some cases, smaller serving room coolers or both. Providence Process Solutions can design and oversee the turn-key installation of coolers that range in size from small 10' X 15' to as large as entire warehouses. Cooler designs include box sizes, evaporator and condenser sizing, large fork truck and manual entry door placement and door types, lighting, floor composition and cooler perimeter condensation abatement provisions.

**• Secondary Process Services Including Process Piping Designs** – Every beverage plant will not only require "primary production equipment," but will also require "secondary production equipment", which are used to support the primary production equipment. These secondary systems are designed to support the entire plant's resource requirements not only for initial equipment installations, but long-term equipment additions as well. Design with the "end in mind", is a typical philosophy used when designing secondary production equipment systems as outlined below.

**o Water Filtration and Delivery Systems Design,** – Water pressure boosters and water heaters are reviewed to support process equipment requirements. Water quality may include grains hardness or purification requirements for items like metals, non-metals and even chlorine and chloramine removal. These systems can be as simple as a water softener, to more complicated reverse osmosis membrane filtration systems. This design service begins with the definition of a water purification specification, flow rates, anticipated loading rates, and water test reports from the local water supplier.

Several water purification systems are often required per plant. Equipment suppliers are defined, layouts are drawn in AutoCAD, and water process piping drawings are created in AutoCAD, where valves, filters, pipe runs, pipe diameters, pressures, flow rates are all engineered based on primary equipment requirements.

***o Sewage Treatment Systems Design,*** – This service begins with an analysis of your current effluent BOD and COD levels and then compares these current or anticipated future levels with local regulatory specifications. If simple pH monitoring, or simple temperature control systems are required, Providence Process Solutions supports these designs in-house. If more complicated effluent treatments systems are required, Providence Process Solutions will solicit engineering support from Providence Process Solutions' preferred partner program professional engineering firms, but will maintain overall project management / design lead firm to ensure continuity and specification / budget compliance throughout the entire project.

***o Boiler / Steam Systems Design,*** – Boiler / steam system design services begin with a solicitation of certified drawings from each equipment manufacturer's equipment that requires steam. This data is then converted into a steam process piping drawing that includes pipe size, flow rates, steam pressures, valves, pressure regulators, pressure safety valves, steam trap assemblies, condensate return tanks, vacuum breakers, expansion joints, boiler sizes, steam filtration, feed water conditioning, feed water tanks, blow down separators, piping runs, steam header design, blowdown piping, water hardness testers, make-up air system specifications, boiler flue venting, and a host of other ASME standard design considerations. All steam system piping layouts, and piping equipment is specified by brand name and model numbers.

***o Glycol Chiller Systems Design,*** – Glycol system design services begin with a solicitation of certified drawings from each equipment manufacturer's equipment that requires glycol. This data is then converted into a glycol process piping drawing that includes pipe size, flow rates, cooling BTU calculations, valving, pressure regulators, bypass systems, glycol filtration, air eliminators and piping types. All glycol system piping layouts, and piping equipment including the glycol chiller is specified by brand name and model numbers.

***o Compressed Air Systems Design,*** – Compressed air system design services begin with a solicitation of certified drawings from each equipment manufacturer's equipment that requires compressed air. This data is then converted into a compressed air process piping drawing that includes pipe size, flow rates, valving, pressure regulators, air compressor and receiving tank sizing,

safety release systems, compressed air filtration, and piping types. All compressed air system piping layouts, and piping equipment is specified by brand name and model numbers.

***o Co2 Systems Design,*** – Co2 system design services begin with a solicitation of certified drawings from each equipment manufacturer's equipment that requires Co2. This data is then converted into a Co2 process piping drawing that includes pipe size, flow rates, valving, pressure regulators, vaporizer sizing, safety release systems, Co2 filtration, and piping types. All Co2 system piping layouts, and piping equipment is specified by brand name and model numbers. Co2 liquid contract negotiations can also be supported as part of the Co2 system design scope of supply.

***Facilities Design Services,*** – Form fits function. This expression is especially applicable when designing beverage facilities, where the building infrastructure design should be a derivative of the processes and process equipment by which the building encompasses. Providence Process Solutions' facilities design services has really evolved over time as a natural progression from the process and process equipment design services offered over several decades. The facility design process can take on many forms. Providence Process Solutions will typically lead the design process with a facilities layout plan that can include production areas, offices, kitchens, tasting rooms, gift shops, executive conference rooms, coolers, storage areas, grain rooms, etc. The layout drawing includes all process equipment so that we can guarantee all equipment will fit properly. This process takes several revisions with the beverage plant operations team to make sure all team members are 100% satisfied with work and product flow.

Once the layout drawing is finalized, PPS then works with a licensed architectural firm to create elevation and detailed building construction drawings. These drawings are then in turn used as a base drawing by mechanical, electric and plumbing design engineers, (MEP), as well as sprinkler, civil, structural and seismic engineers who are all coordinated under PPS's direction. Having a common engineering firm like Providence Process Solutions coordinate all drawings assures that nothing is overlooked from a process point.

The deliverables include a complete stack of buildable drawings that can be used to go out to bid by general contractors and sub-contractors, again, under Providence Process Solutions' direction.

***Phase 3 – Project Management,*** (2.5% - 5.0% of Project Value) – Once the project is formally approved based on the completion of phase 2 deliverables, phase 3 project management can begin. If the beverage manufacturer chooses to purchase plant process equipment from PPS Process Solutions Preferred Partners, the project management rate charged is typically 2.5% of the project costs managed by PPS Process Solutions using an open book type of invoicing. Otherwise, the project management fee is typically set to 5% of the project value. All project management activities comply with PMI standards and include periodic project team meetings, tight coordination with the general contractor, all equipment contract administration, all process equipment installation including rigging, process piping, process wiring installation and guidance for local building contractors on items specific to process equipment requirements. Equipment start-up and training oversight is also included as part of this service. In order to effectively manage the build of a brewery, PPS will physically move to the job-site location for whatever time is required to support the project management contract's scope of supply. On-site time typically begins a few weeks before the first tank is scheduled to arrive and finishes when the first batch of beer is packaged. A project sign-off list is managed after each piece of equipment has been successfully started up. Once all equipment had been signed off by the customer, the project is closed and the PPS job-site manager departs from the work site.

