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Scottish Construction Centre

DEMONSTRATION PROJECTS CASE HISTORY

STARLAW DISTILLERY

Introduction

The Glen Turner Distillery is the first new green-field grain distillery to be built in the Scottish mainland in over 40 years. Once up to full production, the distillery will produce 25 million litres of whisky a year.

The client, Glen Turner, needed to commence construction of the £30M distillery ahead of conclusion of most of the design. Mindful of projects, such as the Scottish Parliament building, where cost spiralled ever upward largely due to ongoing design during construction, the client was keen to put together a team who would work with a 'whole team' approach to deliver the best possible solution.

Glen Turner also wanted people who fully understood the need to work within their operational requirements and who would genuinely aim to take cost out of the project where ever possible.

The Colorado Group had achieved these aims on previous projects for Glen Turner and therefore the client selected them as the Construction Manager. Arup were chosen as the structural engineers and Frilli Inpianti acted as the process engineers.

The key aims of the project were to:

- procure a distillation plant as close as possible to the existing Glen Turner bottling and maturation site;
- set a new standard in the production of a quality product;
- avoid "end-on" traditional procurement processes by integrating the planning, design, procurement and construction processes;
- identify the best professionals to develop a sound process philosophy, establish a detailed design, procure best practice and construct the plant in a cost effective manner;
- integrate the client's needs, ensuring that the end user was involved in the detailed design; and
- construct the works in a safe and efficient manner on programme and to budget.

The effectiveness of the project was measured through the Scottish Construction Centre's performance improvement (pi) Framework. Level 3 of the pi Framework allowed the team to measure a range of outcomes via automatically generated emails and reports.



The Colorado Group

The Colorado Group provides construction, development and property maintenance services to the public and private sectors. Based in Fife they operate throughout Scotland and the North of England. They are a privately owned business, with a hands-on approach. Over 80% of their work comes from repeat customers. The companies culture is centred on providing a whole team approach to fully understanding what their customers want – and then, through collaboration, aiming to deliver beyond expectations.

ARUP





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Implementation

The project team arose from the client's previous positive experience of working with the same contractor, where warehouse designs were adapted to increase the capacity by 30% over the same footprint. This was achieved by close attention to the customer's key requirements, detailed discussions with the operators and a focused whole-team approach to the customer's requirements.

In the new distillery project at Starlaw, the Colorado Group were involved from the beginning, including the site selection process. A range of different sites were considered, with the area to the west of the current site selected in terms of cost, environmental and logistical savings. This site was not without its challenges, as mine workings were known to exist. However, careful site investigation and re-orientation of the distillery ensured that the 'pin-pointed' location ground conditions could accommodate the structure without the need for costly mine-seam grouting.

Gaining a full understanding of the client's needs, not only in terms of an end-product, but also of the factors that assist in building the facility to the distillation process sequence requirements, ensured that the project was delivered to the tight programme. For example the approach to the building envelop was that of timing the 'weather screen' construction based on the critical path activities associated with the plant and process equipment fabrication and installation.

The establishment of review sessions allowed the team to look at the 'why' behind the design, enabling better layout configurations.

The project

The Colorado Group has previously delivered substantial savings to Glen Turner on previous projects through 2007 and 2008. They were therefore asked to assist in developing the new distillery, situated immediately west of the existing bottling store.

The proximity of the site completely eliminated the need to transport the distilled spirit by road. The spirit can be transferred directly from the distillery to the existing tank farm through pipework. During the feasibility and preconstruction period, the Colorado team assisted with the design, including the extensive ground investigation works that were required to address three separate historic mine seams.

The final position and orientation of the building and the design of the foundations reflect the detailed investigation and design reviews that were undertaken in order to give the client a workable solution. Colorado worked closely with Glen Turner to work through detailed planning consents and compile the master programme for the £30m project, incorporating the numerous layouts needed to meet the process design needs, including the complex process pipe-work and plant layouts. The construction of the building was arranged around the process installation sequence and incorporated extensive fire requirements with the distillation and milling processes requiring a segregated building layout.

The overall construction and process installation phasing required detailed planning and exact sequencing through-out and to ensure the link-up phase did not interfere with ongoing operations. The project team led by the Client and by the Colorado Group in full collaboration with the designers and contractors successfully incorporated the extensive design development requirements into the project during the construction and engineering process, to complete on programme and under budget.





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Implementation ctd

The form of contract was a hybrid Construction Management contract. This focussed on simplicity and flexibility; particularly as work needed to start well ahead of a concluded design.

This collaborative approach spanned the client, design, process and construction elements with a completely open book attitude that allowed changes to be costed and alternatives considered quickly.

The process plant and equipment accounted for 75% of the project costs. The specialist nature of the plant resulted in the involvement of a range of suppliers from across Europe.

Early intervention in the design process, and the flexibility offered by a construction management contract, allowed, amongst other extensive savings initiatives, for around £125,000 savings to be made by forming temporary roads over the finished floor slab.

This allowed the critical activity of the nine 437,000 litre fermentation vats and other wash-charge etc vessels to be constructed early in the programme, thus removing the assembly of vats and vessels from the critical path.

Early in the project it was found that the local effluent treatment plant was at maximum load, with extremely high costs to increase the capacity. Through a rapid assessment of the cost and programme, an on-site effluent treatment facility was proposed with significant capital and revenue cost savings.

DESIGN



Overall Performance



TEST / HANDOVER



CONSTRUCTION



Using the performance improvement (pi) Framework

Colorado was the first organisation to sign up to the SCC's pi Trailblazer program, supported by Scottish Enterprise & ERDF Funding.

The performance improvement, "pi Framework", was designed by the SCC to encourage the use of performance measurement and demonstrate its value to organisations of every size and at every level of the Scottish construction supply chain. The "pi Trailblazer" programme offers direct support to a small group of selected organisations that have a real interest in implementing a performance measurement process based upon the SCC pi Framework.

The SCC pi Team supported Colorado on the Glen Turner Distillery project by helping to capture performance feedback from all the key stakeholders on the design, construction & handover phases of the project.

On-line electronic surveys were issued to several key

representatives from the client, their specialist advisers, architects, structural engineers, quantity surveyors and the Colorado construction team.

All assessors were asked the same set of questions and to score them based on their performance expectation.

Assessors were encouraged to enter comments to the on-line scorecards to help drive improvement. The process was quick and simple with each assessor spending between 10-15 minutes to fully score and give comments.

Performance Dashboards (see images above) gave real-time analysis and feedback at summary (overall) level and at 'drill down' levels for each of the phases and measures. They also show the differences in feedback between the stakeholders and any areas for concern or focus; however these proved to be minimal.

The dashboard extracts highlighted that all stakeholders scored the project highly, placing performance firmly in the green - "Exceeds Expectations" range.



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Benefits

- the establishment of a new benchmark of best practice through collaborative working;
- fast-tracked construction by targeting the critical path;
- efficient production by focussing on producing the best process available and integrating the latest technologies;
- a positive team ethos by collaboration with the end-user through the design and build process;
- significant cost and other intangible savings for the client through team working and effective collaboration; and
- effective measurement of key indicators across the project allowing the project team to identify potential areas of improvement.

Possible improvements

- Although the project was an undoubted success, all members of the project team identified some areas for improvement to ensure even greater success next time.
- Where possible utility supplier engagement needs to be improved to minimise the risk to cost and programme.



The lessons learned

- Good team working is crucial to the success of a project. This must involve all of the members of the team, who must understand the constraints placed upon one another.
- Constant vigilance for savings opportunities. All on the team need to understand the project timescales and budget requirements and innovate to improve on them.
- The right choice of contract is vital. The construction management contract selected for this project turned out to be crucial to the success due to the flexibility it offered.
- In order to deliver a successful project everyone needs to understand the client's requirements throughout the project rather than just the requirements for the end product.
- A detailed pre-construction ground investigation is imperative in order to determine the underlying conditions and the possibility of expensive variations during construction. Early liaison with the statutory authorities is also necessary to ensure that problems do not arise at a point when it is too late to deal with. This includes the planning authorities and Scottish Water.

What the participants say

"We found the key to success on the project was: operating a realistic budget, understanding the process and the needs of the operation at the outset, rationalising and focusing on the critical items (do not get stuck in the detail too early), understanding the needs of others within the team and respecting / understanding the input needed to bring solutions.

Communication is the key to understanding any issues; accept that your ideas will be challenged and accept change with enthusiasm"

Gary Gibson, Colorado Group, Joint Managing Director

Want to learn more about this project or how to nominate a demonstration project?

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