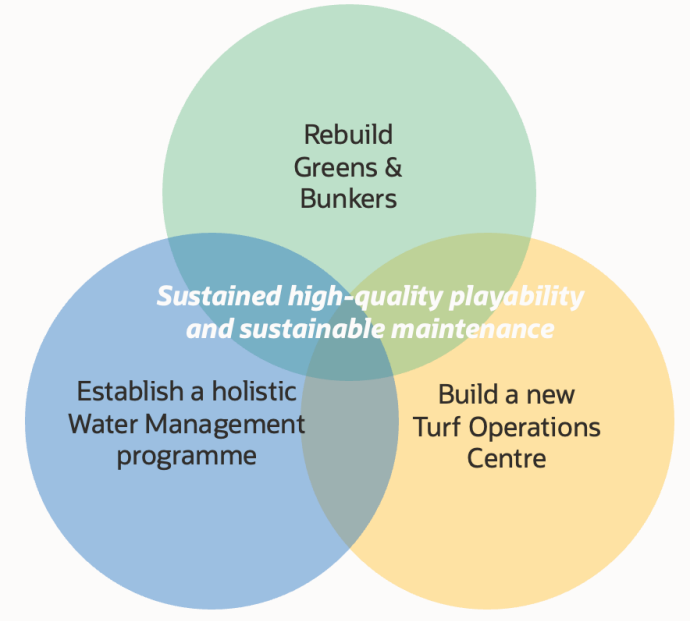


REJUVENATION OF OUR G&CCB GEISBERG COURSE

Measures to achieve a sustained and sustainable quality for our golf course at a reasonable cost.

JTG November 2026

Summary

The Golf and Country Club Basel has, in its history, 3 locations and 3 courses: St Louis 1926-1939, 1946-47: Lörzbachmühle 1950-1964: Geisberg 1964 – to present. Each of these courses had 2 things in common: Dedicated and ambitious members and, the same soil characteristics.

Diminishing returns on the investment in maintenance have been apparent for several years. The Geisberg course, entering its 63rd season, is showing its age after an estimated 682'000 rounds and 1000's of mowing cycles. It is increasingly difficult to maintain the course to the quality standard expected by our Members.
More detail on pages…3-4

The core problem is soil quality. The clay / silt / loam components which make up the soil on the fairways are not conducive to natural drainage nor are they a good foundation for plant growth. The soil is typically compacted with few interstitial spaces or pores to hold water, air and nutrients.
The poor drainage properties of the soil lead to increased incidence of diseases, poor grass growth and muddy conditions after rainy periods which is worsened by the omnipresent earthworm. The greens, which are a man-made construct, have lost the integrity of their soil structure. The different soil layers have become compacted significantly reducing the drainage properties they might have had. The non-installation of drainage in the greens was, in retrospect, an oversight.
More detail on pages…4-6

Many additional elements contribute to ensuring that the achievement of a sustained high quality playing surface is an increasingly difficult proposition. The weather extremes bringing drought, heat, short sharp deluges of rain and storms, tax our ability to recover the integrity of the playing areas, greens, fairways, bunkers and roughs alike. Government regulations concerning bio-chemical treatments are leaving us increasingly exposed to grass diseases. The restriction of the number of available substances has dramatically increased the likelihood of treatment resistance.
More detail on pages…6-7

The Solution incorporates a combination of: water drainage and conservation, soil improvement, green / bunker rebuilding and enablement of the Turf Operations Team. The **Rejuvenation Programme** has 3 areas each of which deliver parts of the solution.
More detail on pages…7-9

Water management foresees the installation of a network of pipes to carry water from the fairways and greens to the ponds or, on the front 6 holes, to run-off areas. As was proposed at the last AGM in January a test phase will be conducted on fairways, 10,18 and the driving range. The test area has been changed for economic and work efficiency reasons. During the pipelaying the topsoil will be injected with sand, around 600 tons per hectare, which will enhance the drainage effectiveness and the soil characteristics.

Green / Bunker replacement will replace the compacted and poorly drained greens and bunkers with a modern multi-layered construction with proper drainage. Equally the construction will facilitate the replacement of the grasses with drought, heat and disease resistant varieties.

The Turf Operations Centre will replace the Hangar with a modern regulation compliant facility. An ergonomic design will enhance the efficiency and effectiveness of the Turf

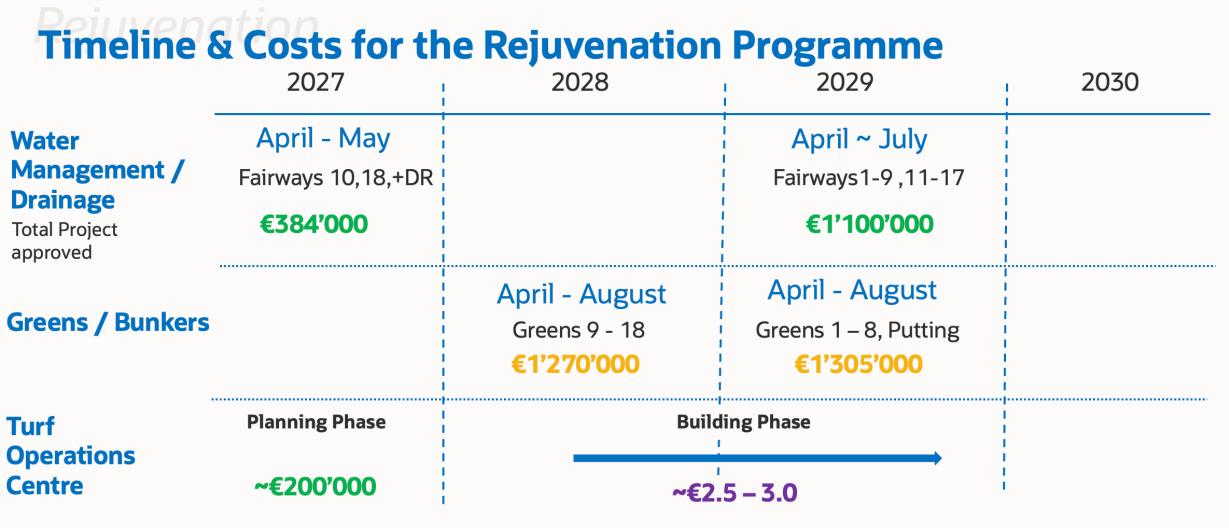
Operations Team and provide secure storage for the machine fleet and materials. Equally, it will provide a safe work environment for the employees. The new buildings location will be on land owned by the Club and already zoned for building. The building design is fit for purpose and derived from the functional needs of the operations team. The size of the building will be optimized by retaining the existing Hangar for ancillary storage requirements. The procedure to avoid surprises and obtain a fixed price for the project will entail the investment in a Design phase followed by a Request for Proposal to several construction firms.
More detail on pages…10-14

The Costs and timeline of the Rejuvenation programme depend on votes of the members.

The **Water Management** /Drainage project has been approved contingent on the success of the test phase. The bulk of the drainage project could be foreseen, depending on the test results, for late 2028 and 2029.

It is anticipated that the **Green/Bunker** rebuild will be voted on at the AGM in January of 2027 with possible Phase 1 execution in 2028. The second segment of the project Greens 1-8 and the putting greens will follow in 2029.

The process for the approval and building of a new **Turf Operations Centre** involves a Planning Phase and a Building Phase. The former will ensure strict design adherence to the functional requirements, the later will ensure the best price / value is achieved for the Building. Approval for the Planning Phase will be sought at the AGM 2027
More detail on pages…13-14



A very brief history of our Club courses and installations.


St. Louis Clubhouse ca. 1926

Founded in 1926 the Club's original 9 holes were built near St. Louis within sight of the industrial might of Basel. The war years, 1939 to 1945, closed the boarder and the course succumbed to the agriculture needs of occupied Alsace. Attempts were made in 1947 to revive the course but it remained suitable only as a training area. The desire for a course on Swiss territory led to a relocation to Lörzbachmühle near Schönenbuch. Built at an estimated cost of CHF 1.2 Mio, in 2026 terms, it was planned to open in 1948. Wet weather caused significant delays with interim winter training at the Mustermesse. The course was opened in the spring of 1950 and was variously described by some as an "A region imbued with Eichendorfian Romanticism… picturesquely fringed by a stream…." and by others, less charitably, as a "Field, Forest and Meadow Pitch". The wetness of the land also brought the familiar scourge of "Wormproblemen". By 1954 our ambitious Club predecessors began to think big. They surreptitiously bought over 65 hectares of land on and around the Geisberg between Hagenthal Le Bas and Wentzwiler. In 1960 Dr. Bernhard von Limburger's plans were given the go-ahead. After members removed stones from the prospective fairways and the grow-in period, the 18 hole championship worthy golf course was opened for play in the spring of 1964.


Lörzbachmühle Tee 1 ca. 1952


Geisberg 1965

Developments on the Geisberg

Investments in the course proceeded apace with: machine-hangar 1973, 2 irrigation ponds 1975, expansion of the machine-hanger 1994, drilling of wells in 1992, 1994 and 1998 which brought water capacity to 1000 m^3 per hour, the expansion of green 7 was undertaken in 2000/1. It was noted in the 75th anniversary book published in 2001 that «However, the idea of a permanently installed irrigation system for the entire course – a project that remains controversial and costly to this day – has not yet been implemented. Consequently, the brown patches that can appear on the fairways during prolonged dry spells in summer are likely to remain the main topic of discussion between the head greenkeeper and the members.» The irrigation system was realized in 2008 at a cost of €1.6 Mio. In 2025 a new pond was completed to bring our reservoir capacity to around 20'000 m^3. At the same time, drainage ditches were built to south of fairways 17 and 18 to capture water run- off from the adjacent fields.

The course was built on a combination of ploughed farmland, fruit orchards and forested areas. It took some imagination in a pre GPS and digital time to craft a golf course out of this varied landscape. Nevertheless this is what von Limburger did. Despite changes in golf technology the course remains as challenging as it was in the 1960's. It is our intention that the course retains its characteristics, and challenges and continues to provide joy to our members for decades to come.


Clearing trees for Geisberg Fairway 10 ca. 1962

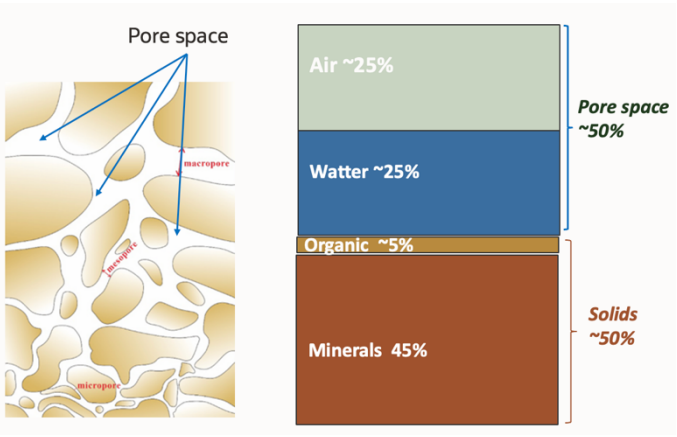
Today and tomorrow

Our course is approaching in its 63rd season (2027), the course has been played, conservatively estimated, 682'000 times, the greens have been mowed 4'300 times and the fairways approximately 2'600 times.

Members in 2026, as in 1926, are still expecting to enjoy the game, experience the challenge of the sport and even to simply maintain health through exercise in nature. To enable this, the management of the course needs to ensure the quality of play, and the sustainability of the course at a reasonable cost. The challenges in the maintenance of the golf course have changed somewhat over the years but expectations are the same.

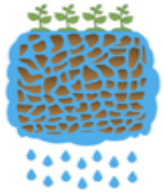
Soil: the science

The structure of the soil, specifically the **particulate size** determines its properties; Does it hold water? Does it drain well? Are sufficient nutrients present?
Soils vary widely in their properties. Silt typically has a particle size of between 0.05 – 0.002 mm which means the pores (spaces in the soil) are very small, it holds water well, but drains slowly and is highly compactable. Clay has a much smaller particle size < 0.002 mm meaning the microscopic pores retain water by surface chemistry and exhibit almost no gravity drainage. A single grain of sand, by comparison, can be 40 × the diameter of a silt particle and 1,000 × that of a clay particle. The interstitial properties of sand are such that a good sandy soil drains 10,000 × faster than one of a tight clay.
An ideal soil composition is half solid and half empty pore space. The tiny voids between and within particles hold air and water in varying proportions. Ensuring the right balance is key to a healthy root zone and the growth of robust grass roots.

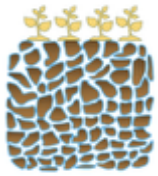


Soil and Water:

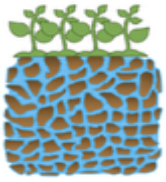
Plants need adequate water and nutrients to grow. The drainage properties of the soil determine how much or how little water is held in the soil. Achieving the right balance at any given time is essential to robust and sustained root growth.



Saturated soil
Too much water or saturation leads to poor plant growth and increases susceptibility to diseases.



Tipping point dryness
Too little water deprives the plant of both adequate nutrients and water resulting in desiccation.

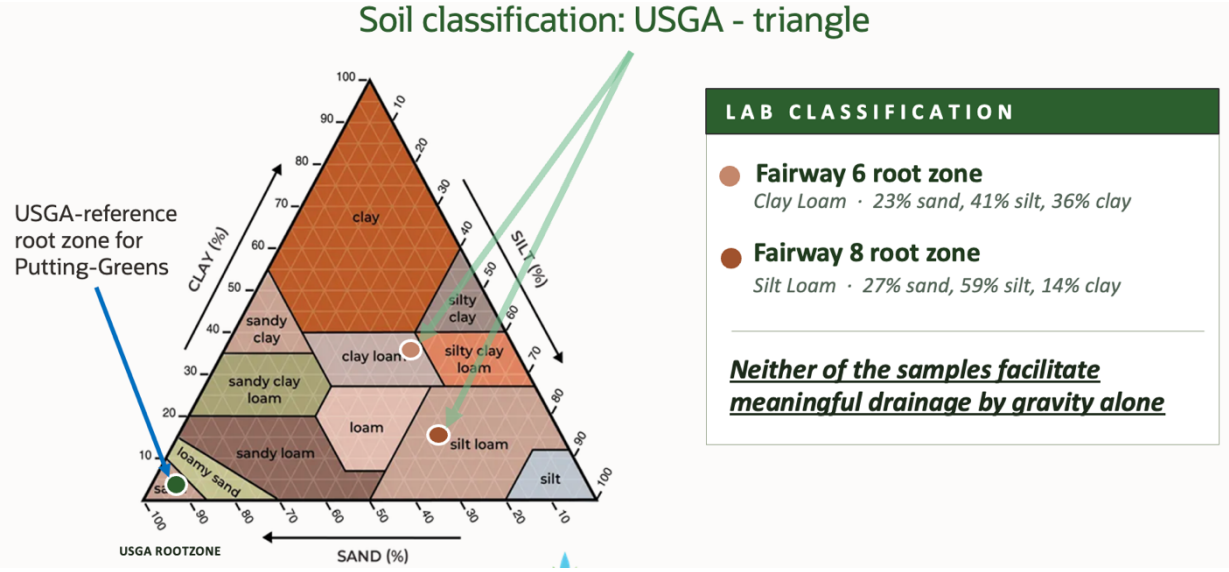


A properly balanced soil will have an adequate amount of air and water within the macro and micro pores. Achieving this requires the right particulate to enable "**Field Capacity**" ; good drainage yet with water retention capacity.

Our soil and its challenges

On all 3 courses , St. Louis, Lörzbachmühle and the Geisberg, it is certain that the soil properties were the same; a combination of clay, silt and loam. All had / have the same soil with the same problems.

As the laboratory analysis shows, the prime characteristic our soil type is its small particle size with very **poor drainage properties**. Equally, when it does dry out it becomes hard and, to a degree hydrophobic. This means that rehydration requires substantial seepage of water into the soil.



Greens are a man made construction meant to maintain a crop of closely mown grass with a flat, firm base with good drainage properties. Our greens constructed in 1962-64 where built

on a clay base with a gravel layer, a sand layer and an organic layer. Subsurface drainage pipes were not used. Over time, 62 seasons, the layers have become compressed and compromised. The clay and sand has mixed together and the organic layer has developed anerobic properties preventing proper oxygenation. The greens are often saturated and need significant mechanical work to improve the poor state of the grass roots.

Another direct impact of poor drainage is muddy conditions. These are exemplified by the dreaded **"Worm Problem"**. Earthworms migrate to the surface in wet soils, when the pores fill with water and the oxygen is reduced, they burrow through the soil and leave their castings on the surface. While conducive to soil health under normal circumstances, worms add additional mud to otherwise muddy conditions particularly in the spring and fall periods.

Disease threats

Excessive and prolonged water retention in the soil renders turf grass more prone to **multiple diseases**. The moisture creates conditions that help many turf pathogens infect and spread.

- Grass blades stay damp longer: Dew, rain, or waterlogged ground can keep grass blades wet, giving fungal spores time to germinate and enter the plant.
- Roots get less oxygen: Saturated soil contains fewer air pockets. Stressed roots absorb water and nutrients less effectively, making grass less able to resist infection.
- Grass may become weaker: Poor drainage can cause shallow roots, thinning, and nutrient stress. Weak or damaged turf is more vulnerable to disease.
- Disease spreads more easily: Wet foliage and splashing water can move spores between plants, while dense, humid turf dries slowly.

Disease types

Disease	**Common pathogen(s)**	**Typical conditions**
Dollar spot	*Clarireedia* species (formerly *Sclerotinia homoeocarpa*)	Warm days, cool nights, prolonged dew, and low nitrogen
Brown patch	*Rhizoctonia solani*	Warm, humid weather and extended leaf wetness
Pythium blight	*Pythium* species, including *P. aphanidermatum*	Hot, very wet conditions; technically oomycetes, not true fungi
Anthracnose	*Colletotrichum cereale*	Heat, humidity, and stressed or closely mown turf
Snow mould	*Microdochium nivale* and *Typhula* species	Cool, wet conditions, especially under snow cover
Red thread	*Laetisaria fuciformis*	Cool, damp weather, often with low nitrogen
Fairy ring	Several basidiomycete fungi, including *Marasmius* species	Fungal growth in soil or thatch; symptoms often appear as rings

Treatments

The multiplicity of potential diseases require different treatments at different intervals. The legislative trend in France has been to progressively **eliminate the use of synthetic pesticides** in non-agricultural spaces. For the very few instances where products may still be authorized for use on golf course greens or tees, the list of permitted active substances changes frequently based on European Union and national regulations (due to substance renewals or non-renewals). The limitation of options increases the risk of resistance to treatment. In 2026 Turf Operations sprayed the greens 7 times from May 12th to October 5th. The diseases tend to recur at the same spots inhibiting our efforts to speed regeneration of the grass scars.

Biological products represent a good option to maintain the health of our turf grass but they are only cost effective when the soil is well drained and the roots of the plants are robust.

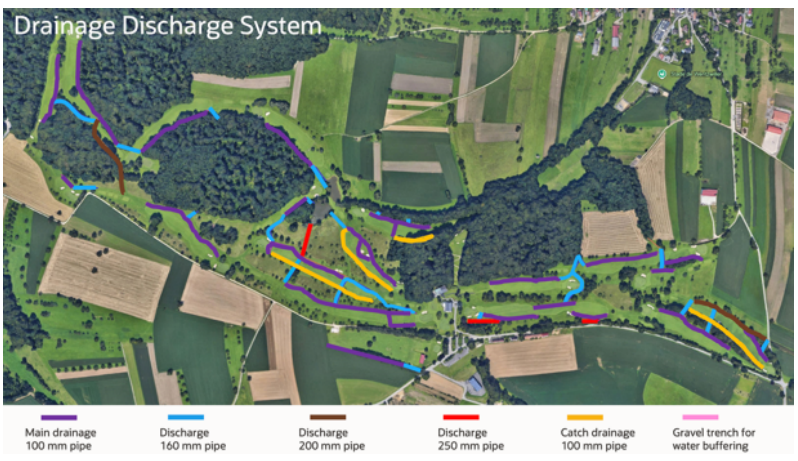
Drought, heat, irrigation and grass types

The summer of 2026 was one of the driest in the past 15 years. We experienced 48% (142 mm) of the average rainfall expected between March and August. The government forbade the watering of our fairway, nevertheless we were able to preserve the greens and fore-greens with nightly watering. The prolonged drought and the need for irrigation showed that our decision to build additional water conservation capacity was the right one. With close to 20'000 cm3 we can survive most drought periods. But, 2 issues became readily apparent: 1. The irrigation system, installed in 2008, showed some weakness. The water pressure and water flow through the system was not sufficient to provide adequate water to several greens. The water arcs on greens 14 and 15 were not able to overlap and provide the coverage required. Equally, the sprinkler distribution deposited too much water on some areas of the greens and fore greens. 2. The inconsistent drainage qualities of the greens left left dry spots and wet spots with identical irrigation schedules. The differing areas of soil compaction and consistency meant that even labour intensive hand watering could not establish a consistent and sustained level of moisture on the greens.
It is a very long and inefficient process to replace grass types through incremental planting methods, so called overseeding. We have a number of grass types on the course, the majority of which are neither heat nor drought resistant. Newer hybrid grass types incorporate heat and low water tolerance with improved disease resistance. In the process of the course renovation we will seed and overseed with these new types of grass.

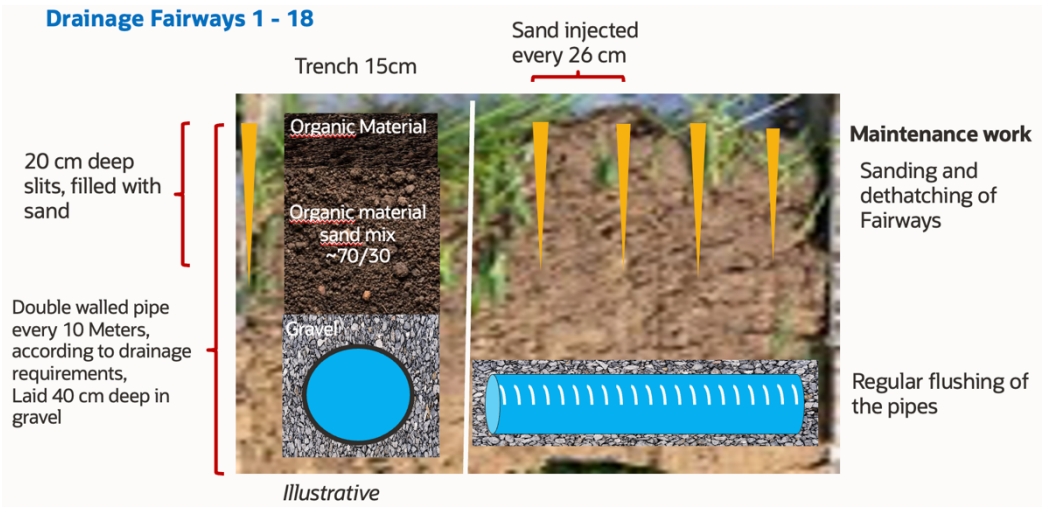
The solution: improving soil quality and water content properties

Fairways

We mow approximately 17 hectares of fairway and 1.2 hectares of greens. It is possible, as some golf course choose to do, to replace the complete upper layer of soil on fairways, 10 to 20 cm in a process called sand capping. On our course this would require the removal of ~38,250 metric tonnes of top soil and replacing it with the equivalent tonnage of high quality soil with proper drainage qualities. The movement of around 76'000 tons of material is costly and environmentally questionable. The most cost effective method of improving soil quality and water content characteristics on large areas such as fairways is drainage combined with a long term programme of soil augmentation.
Our Water Management project incorporates soil improvement with drainage to capture and reuse the water on the course. The drainage programme includes a comprehensive network of pipes, ditches and drains designed to channel water, where possible, to our ponds. The ditches, as on south side of fairways 17 and 18 stop and capture water flowing from the adjacent fields. The drainage pipes are installed in trenches on the fairways at an average distance of 10 meters and a depth of 40cm.



The distance between the fairway pipes will vary according to drainage required. The perforated pipes (double sided for strength) are laid in a bed of gravel and covered by a layer of sand and organic materials. The coarse sand is selected for its size to minimize infiltration into the pipes and the organic materials minimize damage to grass in the hot summer months. The fairway pipes are connected to larger discharge pipes installed alongside the fairways. These also serve the drainage needs of the greens. Installation of the pipes is a highly efficient process, usually requiring 5 to 8 work days depending on size of the area. Subsequent to the pipe laying the entire fairway plus parts of the roughs will be "injected" with sand. This soil improvement measure also serves to direct the water to the pipes. The small slits, ±2cm broad and ±20cm deep, depending on the incline of the terrain, are made every 26 cm and filled with sand, these are then rolled flat. This method puts approximately 600 tons of sand into each hectare and increases the efficacy of the pipe drainage.

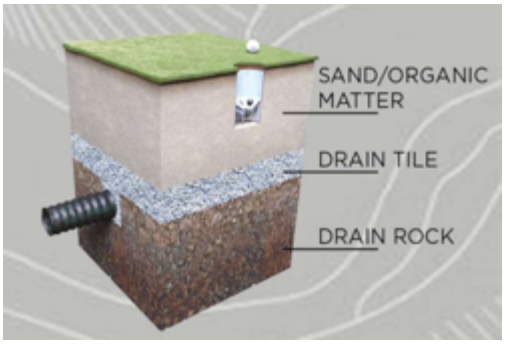


The effectiveness of the system is ensured with regular maintenance. The pipes are installed with ports for inspection and flushing to take place at regular intervals. In addition to overseeding with new grass types the fairways will be regularly dethatched and sanded to permit water to efficiently reach the pipes.



Greens

Greens make up close to 5% of the closely mown course area but consume between 30% and 40% of the labour. As mentioned above, our greens are well beyond their normal life span (30 years) and are in need of replacement. The replacement will include the greenside bunkers as they are an integral part of the green complex. The replacement of the greens requires the complete excavation of the old green, if it is to be in the same place. Based on a detailed architecture, the new build will be made of clearly defined layers of gravel, sand and organic materials . The standard USGA recommended construction ensures consistent drainage and with proper care, a smooth, firm, surface. The construction of the greens will need to consider multiple factors:



- The desired topography of the putting surface, size, slopes , mounds or berms.
- The size of the apron, especially important for maintenance and mowing considerations

- Adequate areas for hole placement
- Positioning of the bunkers
- Placing of the irrigation pipes and sprinkler heads
- Selected materials to ensure field saturation and a consistent drainage.

The establishment of new greens will allow us to plant new heat, drought and disease resistant grass types and use more biological products to maintain the health of the greens. We will have ample opportunity to discuss potential changes to the location of some of the greens but the general tenor of the rebuild is to maintain the original von Limburger design.

Timing of the projects

Water management

We began the initial phase of the Water Management project in 2025 with the completion of the new pond and the water catchment ditches. The next phase, which was voted on at the AGM in January of 2026, will begin in mid-April of the 2027 season. It is expected to take 4 weeks depending on the weather and will conclude in mid-May. The original proposal at the AGM by Staffan Bjöörn suggested fairways 14 and 15 but, after a review of the economic, scientific and work requirements it was agreed with Staffan that a new proposal to do the work on fairways 10 and 18 and the driving range would well suit the desired “test” period. The work will cause some disruption but the fairways will be open to play on the weekends and immediately after the conclusion of the work. Some free drop allowances will be required to maintain the integrity of the seeded trench areas.

Should the test results prove positive, plans will be made to complete the project on the rest of the course. The measurements of efficacy have yet to be definitively be defined but will include: observational information (inside the pipes, soil surface, worm presence), scientific data (moisture measurements). The test period is highly dependent on weather conditions. A 2 year waiting period would mean that we can begin the rest of the project at the earliest late 2028 or in 2029.

Green / Bunker replacement and continuity of play



The rebuild or replacement of one green requires approximately 6 months from excavation through to the end of the grow-in period. The construction must be undertaken in dry conditions which means that the work must begin in the summer months. The experience of green renovation at the vast majority of clubs suggests conducting the work over 2 seasons. Should the General Assembly approve the project, the plan is to begin with greens /bunkers 9 to 18. Work would commence in early summer of 2028 and the greens would be playable by May of 2029. In the summer of 2029 the remaining greens /bunkers, including the putting greens, would be addressed and will be playable in May of 2030. All greens are not subject to excavation at the same time and, in an effort to keep the course open for play, we will establish high quality winter greens. The drainage of the greens will require the building of drainage infrastructure alongside the fairways to the ponds. Once the trial period for the

fairway drainage has been successfully concluded these discharge pipes will be connected to the new fairway drainage pipes to be installed on the remaining fairways.

How the course renovation projects were awarded
A request for proposal, written with support of Hendrik Hilgert (golf course architect) for both the Drainage project and the Greens Bunkers was sent to the leading contractors in golf course construction and maintenance in Europe and the UK. Of the 3 who responded SBA Group of the Netherlands responded in the most detail and with the best prices for the both of the projects. There synergy of having the same contractor for all of the course renovation is apparent in cost management and project continuity and oversight.

The maintenance facilities / Turf Operations Centre

Our maintenance facility has been expanded several times over the years. The "Hangar", as it is called, has unfortunately reached a stage where it is only marginally fit for purpose. We have a machine fleet with a replacement value > €2.5 mio. The increasing sophistication and cost of the machinery requires a suitable building for safe storage and maintenance. According to the USGA[1] "An organized and efficient maintenance facility is a critical part of a successful golf course maintenance operation ."…" Access is key. Your team should be able to find, move and replace tools and equipment easily."… "Providing a safe, organized and desirable workplace helps attract and retain good employees and sets a tone of pride and professionalism for the work out on the golf course."

Multiple factors indicate the need for a new facility:
The Hangar is an aging building and would require considerable investment to bring it up to requirements; Roof leaks, electrical system deficiencies, lack of air exchange, not enough climate controlled area, no water treatment, no bio-chemical storage, inadequate materials storage inside and outside etc. The location of the Hangar is also problematic as it is too close to the public road (4m) to allow the safe manoeuvring of equipment. Equally, it is not optimal for the delivery of materials and access to the course.
The efficiency of operations is hampered by the lack of ergonomically determined space to properly organize the equipment and materials. We have retrofitted the building with shelving and maximized the use of space yet the deployment and replacement of equipment requires considerable manoeuvring. Considerable daily work time is lost waiting to wash and rearrange equipment.
Work safety is a significant concern due to the tight spaces for storage and equipment maintenance. The mechanics area is in a common area used for access to the workers facilities and lacks a machine lift, parts storage and air exhaust.
Regulatory requirements are, or could, be a significant issue. We were visited in June 2026 by the Direction Régionale de l'Alimentation, de l'Agriculture et de la Forêt (DRAAF), the governmental body responsible for monitoring the use of bio-chemical products. While they approved of the bio-chemical treatment processes they admonished us for the lack of water treatment capabilities, in particular for cleaning bio-chemical equipment and the lack of secure storage. We can meet the minimum requirements in these areas with an investment of around €30k, however, in the near term we will need to have a full water treatment capability. Our current fuel storage is no longer compliant and must be replaced with double walled containers and be placed further away from the road. The workers facilities are woefully inadequate and would not pass an inspection by the Ministère du Travail et des Solidarités.

[1] The Fundamentals of a modern Maintenance Facility, John Petrovsky USGA October 2023

Urgency / Timing

With some investment, indicated above, the "Hangar" can remain viable, nevertheless a real transformation of our Turf Operations with require a new facility.

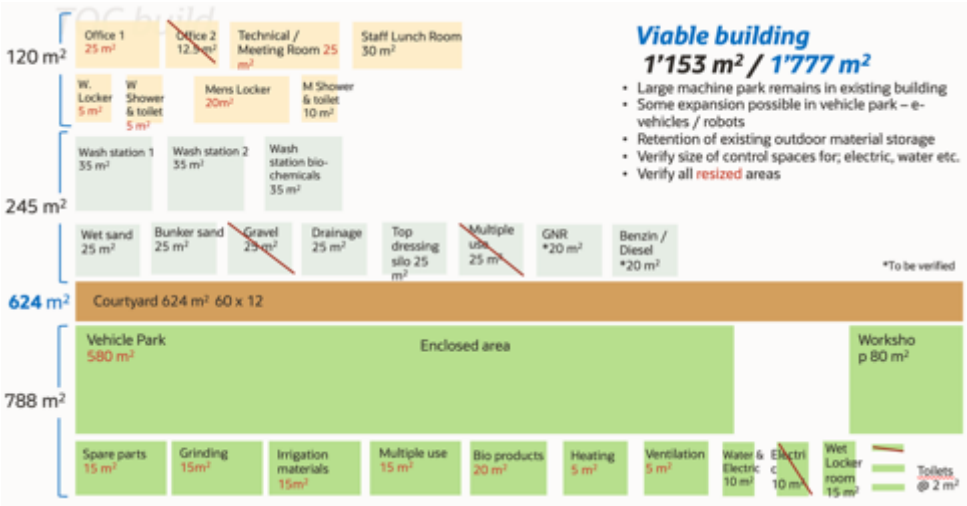
The proposed solution and how it was arrived at

The investigation for a new Facility considered:

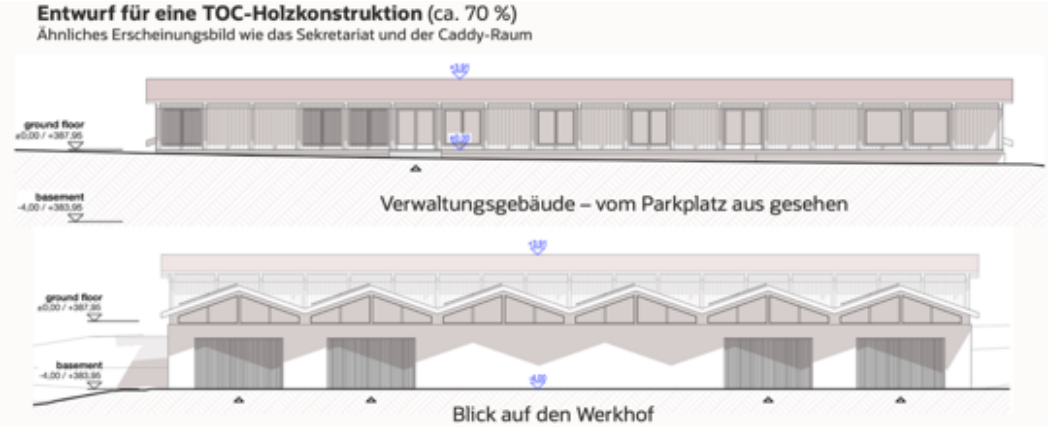
1. **The renovation and potential** expansion of the existing Hangar.
   The Hangar is located 4 meters from the public road. To be viable site would require extending it into the field behind. The field would have to be acquired and rezoned from agricultural use. Equally, the substantial inclination of the land would require substantial fill to achieve a suitable flat area. Added to this, the site is not logistically optimal.



2. **A new site**
   Suitable land owned by the Club was identified below the second parking lot. This site offers the potential for a centrally located Operations centre with good logistics and easy access to roads and electric and water services. It is zoned for building and, as such, requires no additional administrative changes.
3. **Requirements for a facility**
   The basic requirements for a facility which would meet regulatory requirements and functional specifications for an efficient operation were collected in conjunction with an architect experienced in industrial buildings and who was responsible for the St Apollinare renovations and buildings.



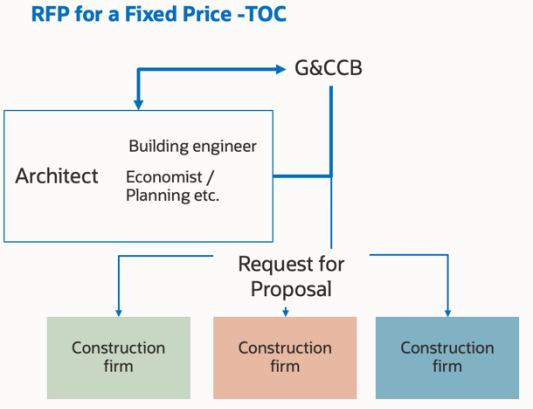
A Building Commission was formed to assess and evaluate the options for the new Turf Operations Centre. Two options have been presented. The Building Commission is considering the options based on several factors:



- Meeting the functional needs of the Turf Operations. As size (m^2) largely determines the potential cost, the Building Committee considered different sizing options and retention of the Hangar to reduce the footprint of the new building.
- Ecological impact, does it have a sensible carbon foot print (a building permit criteria)?
- Aesthetic; does it provide continuity with existing buildings and support the Club image?
- Cost to build; can it be built for a reasonable amount and at a predetermined fixed price?

Next steps

The Building Commission recommends that a design be selected which would be developed in sufficient detail for submission to at least 3 construction companies in a request for proposal (RFP). The RFP process will result in a fixed price project where we can be certain of the outcome.



Project Costs (cost include 20% VAT)

The costs associated with the course renewal projects are fixed price for the construction (with potential inflation adjustments depending on the time of execution). There may be some variability in the cost of materials such as sand and organics and seeds required to build the greens and fill trenches. The materials costs are respectively 15% of the drainage project and 28% for greens / bunkers project. We have identified local suppliers to keep transport cost at a minimum.
The Water Management /Drainage project will cost €1.48 Mio. allowing for completion in 2029 and some additional costs for the trial.

Water Management / Drainage	Test phase 2027 -28 Fairways 10,18, Driving Range	Fairways 1-9,11-17 2029	
	€384'000	€1'100'000	**€1'484'000**

The Greens / Bunkers renewal is projected to cost €2.6 Mio assuming construction completion in 2029.

Greens / Bunkers	Greens 9 bis18 2028	Greens1 bis 8, putting, chipping 2029	
	€1'270'000	1'305'000	**€2'600'000**

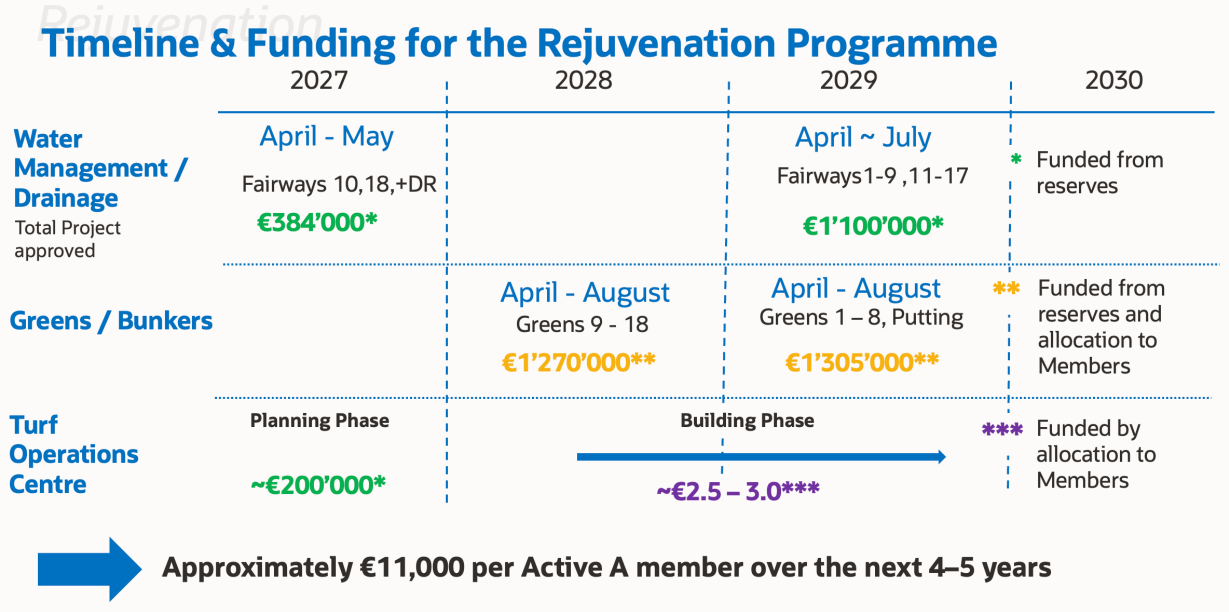
The Building Commission is convinced that a suitable Turf Operation Centre building can be built at a cost of between €2.7 and €3.2 Mio.

Turf Operations Centre	Design to RFP	Build	
	~€200'000	~€2.5 – 3.0	**~€2.7 – 3.2**

The timing and funding of the projects.

The trial[2] of the approved drainage project will begin in May of 2027 with fairways 10,18 and the driving range. Formal approval for the change of the test area will be sought at the AGM January, 25th 2027.

Approval for the Greens / Bunkers project is also planned for the AGM of January 2027. This will be funded from reserves as well as an allocation to Members. Should Members approve the project it can begin at the earliest in April of 2028.



The TOC project is planned in 2 phases. Approval for Planning Phase will be sought at the AGM of January 2027. Funds for this will come from reserves. Approval for the Build Phase will be sought at the AGM in January of 2028. Funding for the Building will come from allocation to members and perhaps some generous donations.

Conclusion

The Rejuvenation Programme is an ambitious but necessary step bring the course and the maintenance operation back to a sustainable and sustaining condition. The fundamental deficits of the soil and changes over the last 60 years have rendered the greens and fairways very difficult to maintain to the level of quality expected by the Members. Changes in the environment and weather patterns exacerbate the challenges as do the increasingly restrictive regulations governing the use of bio-chemical products. Without a significant armamentarium of measures the defense against disease affecting our greens has reached a point of severely diminishing returns on investment. The measures proposed for the course are complimentary and mutually potentiating. Each addresses areas for improvement and provide a comprehensive long term solution to the issues of soil improvement, replacement of grasses, effective drainage measures, and water conservation. A modern optimized facility is essential to an effective and efficient operation. This will contribute to time saving, improved capabilities in our workforce and ensure that we are compliant with building, ecological and worker safety and welfare regulations. In addition, it will equip us to welcome new technologies in the near future.

[2] Agreed with S. Bjöörn to change the trial target for economic and work technical reasons