



ASSESSING INFRASTRUCTURE

**MAKING THE METRICS
COME ALIVE**

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Assessing Infrastructure

- *GCM* Magazine Recent Article “Assessing Infrastructure”
- Help Superintendent’s & Other Decision Makers For Forthcoming Renovations, Restorations, Upgrades, Repairs & Replacement

Assessing Infrastructure (Con't)

- 1st Part – Short & Long-Term Plans Of Typically What You Should Do
- 2nd Part – How Long Do Things Last – Life Expectancy Chart

CAPITAL GOLF COURSE IMPROVEMENTS

- Tabled Since 2008 Economic Crash
- Economy Finally Bouncing Back
- Course Decision Makers Have Been Loosening Their Grip The Last Few Years On Previously Planned Infrastructure Work Making Monies Available

RENOVATIONS / RESTORATIONS

- Nobody Knows The Golf Course Infrastructure Better Than The Golf Course Superintendent
- Due Diligence Infrastructure Research Together With An ASGCA Golf Course Architect

RENOVATIONS / RESTORATIONS (Con't)

- Evaluating All Golf Course Components
- Regularly Updated Long-Range Master Plan & Business Plan With Golf Course Superintendent & ASGCA Architect

Infrastructure Life Expectancies

- Climatic Zone
- Age Of Infrastructure
- Quality Of Original Construction
- Previous Enhancements

Infrastructure Life Expectancies (Con't)

- Maintenance Practices
- Operating Budgets
- Capital Improvement Budgets
- Overall Playing Conditioning Standards

GREENS PERFORMANCE

- Performance Checked Every 5-10 Years
- Undisturbed Core Samples By Accredited Physical Soil Testing Laboratory
- Will Determine How The Physical Characteristics Have Changed

Greens

Undisturbed Cores (Con't)

- Testing Different Levels Of Soil Profiles
- Organic Matter Accumulation / Water Holding Capacity / Capillary Porosity
- OM / Infiltration Rate / Aeration Porosity
- Topdressing Accumulation & Quality

Greens

Undisturbed Cores (Con't)

- Particle Sizes & Shapes Have Changed
- Upper Topdressing Layers Compatible With The Original Sand Based Greensmix
- Has The Drainage Gravel Broken Down Prematurely

Greens

Undisturbed Cores (Con't)

- Iron Precipitate On Interface Of The Greensmix & Drainage Gravel Layer
- Iron Precipitate In Other Parts Of The Greensmix Below The OM Layer
- Can Impede The Subsurface Drainage If It Becomes Hard & Dense

Greens

Sand-Based Regrassing

- Strip & Remove Turf & Excessive Organic Matter
- Replace With Compatible Tested & Approved Greensmix
- Fumigate With Basamid, Or Equal
- Regrass – Proven Winner New Grasses

Greens

Push-Up Regrassing

- XGD, Or Equal, Drainage Piping
- DryJect Sand Injection
- Smile Drain Installation
- Drill & Fill Aerification

Greens

Push-Up Regrassing (Con't)

- Deep-Tine Aerification
- Strip Turf & OM Layer
Replace With Compatible Tested &
Approved Topdressing Sand
- Fumigate – Basamid, Or Equal
- Regrass – Proven Winner New Grasses

Tee Improvements

- Strip Turf & Remove Excessive OM
- Enlarge / Add New Tee Surfaces
- Check & Add Drainage Piping / Gravel
- Add Tested & Approved Tee Mix / Sand

Tee

Improvements (Con't)

- Laser Level
- Fumigate – Basamid, Or Equal
- Regrass – Proven Winner New Grasses

Fairways, Approaches & Collection Areas

- Strip Turf / Excessive OM
- Add Drainage Piping / Gravel
- Add Sand Cap After Performing A Moisture Release Curve & Other Tests
- Fumigate – Basamid, Or Equal

Fairways, Approaches & Collection Areas (Con't)

- Regrass – Proven Winner New Grasses
- Provide Annual Sand Topdressing Program
- Regrass Maintained Roughs & Intermediate Roughs Also

BUNKERS

- Wear Out Faster Than Any Other Part Of The Golf Course Infrastructure
- Test 3-4 Bunker Sands In Test Bunker
- Remove Contaminated Bunker Sand
- Check / Replace Drainage Pipe / Gravel

BUNKERS (Con't)

- Add Proven Winner Bunker Liners
- Add Bunker Surrounds Irrigation
- Add Tested & Approved Bunker Sand
2" On Slopes / 4" Settled On Bottoms
- New Bunker Sand Takes 90-120 Days
To Settle Properly

IRRIGATION SYSTEM

- Replace Sprinkler Heads, QC Valves, Swing Joints, Satellites, Master Controller, Weather Station, Pump Station, Fertigation System & Wiring. They Have A Shorter Life Expectancy
- Replace Piping With HDPE / PVC, Fittings, Gate Valves, Isolation Valves
- Check Water Rights

CART PATHS REPLACEMENT

- Cracking / Sloughed-Off Edges
- Tree Roots
- Freezing & Thawing
- Concrete – Tinted / Asphalt
- Cochina Shells / DG / Other Gravels

GOLF COURSE INFRASTRUCTURE

Life Expectancies Chart:

- Warm-Season Climate
- Transition Zone Climate
- Cool-Season Climate

REGRASS GREENS / COLLARS

USGA / Sand Based & Push-Up:

- Warm Season Climate – 8–12 Years
- Transition Zone Climate – 10–15 Years
- Cool Season Climate – 12-15 Years

REGRASS TEES

- Warm Season Climate – 8-12 Years
- Transition Zone Climate – 10-15 Years
- Cool Season Climate – 12-15 Years

REGRASS
FAIRWAYS / APPROACHES / COLLECTION
AREAS

- Warm Season Climate – 10-15 Years
- Transition Zone Climate – 12-15 Years
- Cool Season Climate – 12-15 Years

REGRASS MAINTAINED ROUGHS

- Warm Season Climate – 15-20 Years
- Transition Zone Climate – 17-22 Years
- Cool Season Climate – 20-25 Years

REGRASS INTERMEDIATE ROUGHS

- Warm Season Climate – 10-15 Years
- Transition Zone Climate – 12-15 Years
- Cool Season Climate – 12-15 Years

REGRASS NATIVE / NATURAL ROUGHS

- Warm Season Climate – 5-20 Years
- Transition Zone Climate – 15-25 Years
- Cool Season Climate – 15-25 Years

REPLACE PIPING / LINERS BUNKER SAND

- Warm Season Climate – 5-8 Years
- Transition Zone Climate – 7-10 Years
- Cool Season Climate – 8-12 Years

REBUILD BUNKERS / SURROUNDS

- Warm Season Climate – 10-15 Years
- Transition Zone Climate – 15-20 Years
- Cool Season Climate – 15-20 Years

IRRIGATION SYSTEM

Replace All Above-Ground Components,
Wiring, Swing Joints, Valves & Fittings:

- Warm Season Climate – 8-10 Years
- Transition Zone Climate – 10-12 Years
- Cool Season Climate – 10-12 Years

IRRIGATION SYSTEM PIPING

PVC:

- Warm Season Climate – 20-25 Years
- Transition Zone Climate – 25-28 Years
- Cool Season Climate – 27-30 Years

IRRIGATION SYSTEM PIPING

HDPE:

- Warm Season Climate – 40-45+ Years
- Transition Zone Climate – 40-45+ Years
- Cool Season Climate – 45-50+ Years

IRRIGATION SYSTEM PUMP STATION / FERTIGATION

Replacement:

- Warm Season Climate – 8-10 Years
- Transition Zone Climate – 10-12 Years
- Cool Season Climate – 12-15 Years

CART PATHS

Asphalt Replacement:

Warm Season Climate – 7-10 Years

Transition Zone Climate – 10-12 Years

Cool Season Climate – 12-15 Years

CART PATHS

Concrete Replacement:

- Warm Season Climate – 15-20 Years
- Transition Zone Climate – 15-20 Years
- Cool Season Climate – 15-20 Years

CART PATHS

Cochina Shells / Decomposed Granite /
Other Gravels Replacement:

- All Climates – Ongoing / As-Needed

BRIDGES

Resurfacing:

- Warm Season Climate – 8-12 Years
- Transition Zone Climate – 12-15 Years
- Cool Season Climate – 12-15 Years

BRIDGES

Structural Rebuilding:

- Warm Season Climate – 17-20 Years
- Transition Zone Climate – 20-25 Years
- Cool Season Climate – 20-25 Years

LAKES

Dredging:

- Warm Season Climate – 10-15 Years
- Transition Zone Climate – 10-15 Years
- Cool Season Climate – 15-20 Years

LAKES

Replace Lake Liners:

- Warm Season Climate – 15-20 Years
- Transition Zone Climate – 15-20 Years
- Cool Season Climate – 20-25 Years

LAKES

Rebuild Lake Edges:

- Warm Season Climate – 10-20 Years
- Transition Zone Climate – 10-20 Years
- Cool Season Climate – 15-25 Years

DRAINAGE FAIRWAYS & ROUGHS

Replace Corrugated Metal Pipe (CMP):

- Warm Season Climates - 15-20 Years
- Transition Zone Climates – 20-25 Years
- Cool Season Climates – 25-30 Years

DRAINAGE FAIRWAYS & ROUGHS

Replace PVC / Double Wall Pipe:

- Warm Season Climate – 20-30 Years
- Transition Zone Climate – 20-30 Years
- Cool Season Climate – 25-35 Years

BULKHEADING RETAINING WALLS

Replacement:

- Warm Season Climate – 12-17 Years
- Transition Zone Climate – 15-20 Years
- Cool Season Climate – 20-25 Years

PINE STRAW WOOD MULCH

Replacement:

- Warm Season Climate – 6-12 Months
- Transition Zone Climate – 6-12 Months
- Cool Season Climate – 12 Months

TUNNELS

- Replace Sump Pumps / Piping / Grates
Lighting / Mirrors / Cart Paths:
- Warm Season Climate – 10-15 Years
- Transition Zone Climate – 10-15 Years
- Cool Season Climate – 15-20 Years

TUNNELS (Con't)

Replacement:

- Warm Season Climate – 20-30 Years
- Transition Zone Climate – 25-30 Years
- Cool Season Climate – 25-30 Years

DRIVING RANGE

Fraze Mowing Practice Tees:

- Warm Season Climate – 2-3 Years
- Transition Zone Climate – 2-3 Years
- Cool Season Climate – Carefully

DRIVING RANGE (Con't)

Re-Level / Regrass Practice Tees:

- Warm Season Climate – 7-10 Years
- Transition Zone Climate – 8-10 Years
- Cool Season Climate – 8-12 Years

DRIVING RANGE (Con't)

Rebuild Practice Tees:

- Warm Season Climate – 10-12 Years
- Transition Zone Climate – 10-12 Years
- Cool Season Climate – 12-15 Years

DRIVING RANGE (Con't)

Regrass Practice Fairway / Rough;
Rebuild Target Greens / Target Bunkers:

- Warm Season Climate – 10-15 Years
- Transition Zone Climate – 12-15 Years
- Cool Season Climate – 12-15 Years

SHORT GAME PRACTICE AREA

- Regrass Greens / Collars
- Rebuild Greens
- Regrass Tee / Fairways / Roughs
- Replace Bunker Sand / Liners
- Rebuild Bunkers / Surrounds

Same Life Expectancies As Golf Course

REBUILD
GREENS / COLLARS / SURROUNDS

USGA / CALIFORNIA / SAND BASED:

- Warm Season Climate – 12-25+ Years
- Transition Zone Climate – 15-30+ Years
- Cool Season Climate – 20-35+ Years

REBUILD GREENS / COLLARS / SURROUNDS

PUSH UP:

- Warm Season Climate – 25-50+ Years
- Transition Zone Climate – 25-50+ Years
- Cool Season Climate – 25-50+ Years

FURTHER INFORMATION

GCM Magazine

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“Assessing Infrastructure”

- By: Terry Buchen, CGCS, MG