Materials & Costs

- **3” down trunking:**
  - €9/tonne
  - 1.6 tonne/metre run = €14.40/m

- **Surface blinding:**
  - €10/tonne
  - 0.6 tonne/metre run = €6.00/m

- **Geotextile** = €2.00/m

- **Installation cost:** = €2.80/m

**Total** = €25.20/m
### Roadway 2

**Materials & Costs**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>4” down trunking:</td>
<td></td>
</tr>
<tr>
<td>- €9/tonne</td>
<td></td>
</tr>
<tr>
<td>- 1.2 tonne/metre run</td>
<td>€10.80/m</td>
</tr>
<tr>
<td>Surface blinding:</td>
<td></td>
</tr>
<tr>
<td>- €10/tonne</td>
<td></td>
</tr>
<tr>
<td>- 0.45 tonne/metre run</td>
<td>€4.50/m</td>
</tr>
<tr>
<td>Installation cost:</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>€2.20/m</td>
</tr>
<tr>
<td></td>
<td>€17.5/m</td>
</tr>
</tbody>
</table>
### Roadway 3

**Materials & Costs**

- **3” down trunking:**
  - €9/tonne
  - 0.75 tonne/metre run = €6.75/m
- **Surface blinding:**
  - €10/tonne
  - 0.45 tonne/metre run = €4.50/m
- **Geotextile**
  = €1.50/m
- **Installation cost:**
  = €1.80/m
  = €14.5/m
Fencer

**Key points**

- Select adequate powered fencer fit for purpose
- Use the proper type of grounding rod (Earth)
- Earthing rods should be 1 m deep in a damp area
- Earthing rods spaced 3m apart

**Main Fencer**

- Permanent power fencing

**Battery Fencer**

- Strip grazing and back fencing

**Solar Powered**

- Obtain energy from the sun to charge battery
- Suited to out farm

**Battery Fencers**

<table>
<thead>
<tr>
<th>Output Joules</th>
<th>Acres</th>
<th>Earthing Rods</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>0.19</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>0.35</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>0.43</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>2</td>
</tr>
</tbody>
</table>
Paddock Design

Key points

- Target ‘Grow in 3 weeks. Graze in 3 days’
- 7-8 paddocks per grazing group
- Aim for a ratio of 2:1, fields are twice as long as they are wide
- Avoid long narrow paddocks to minimise poaching.

<table>
<thead>
<tr>
<th>No. of Stock</th>
<th>Paddock size</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Cows and weanlings</td>
<td>0.5Ha (1.25 acres)</td>
</tr>
<tr>
<td>20 Cows and weanlings</td>
<td>1 Ha (2.5 acres)</td>
</tr>
<tr>
<td>30 Cows and weanlings</td>
<td>1.5 Ha (3.75 acres)</td>
</tr>
<tr>
<td>40 Cows and weanlings</td>
<td>2 Ha (5 acres)</td>
</tr>
</tbody>
</table>
Setting up the farm to graze grass

One extra tonne of grass DM utilised/ha = €105 extra farm profit/ha

**Why?**
- Increase length of grazing season
- Increase grass grown
- Increase sward quality
- Increase live-weight gain
- Increase stocking rate

**1t DM/ha extra grass**
40ha farm
€4,200

**Return on Investment**
2 years

**Key points**
- Start simple
- Use temporary fences
- Invest in reels and polywire
- Select adequate fencer
- Be flexible
Farm Infrastructure

- **Total Area**: 6.3 ha (15.5 ac)
- **Production**: 6.5 Tonnes DM

**Drainage**: Persistent water-logging

**Fertility**

<table>
<thead>
<tr>
<th></th>
<th>pH</th>
<th>P</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>mg/l</td>
<td>mg/l</td>
</tr>
<tr>
<td>Sample 1</td>
<td>6.7</td>
<td>1.1</td>
<td>61.6</td>
</tr>
<tr>
<td>Sample 2</td>
<td>6.4</td>
<td>2.4</td>
<td>62.1</td>
</tr>
<tr>
<td>Target</td>
<td>&gt;6.3</td>
<td>5.1-8.0</td>
<td>101-150</td>
</tr>
</tbody>
</table>

**Poor layout and roadway access**

**No spring grazing, 2-cut silage and grazed in autumn**

**POOR RETURNS!!!**

- **Land Drainage**
  - To reduce waterlogging
  - 1,050 m of drains installed
  - 240 m of open drains deepened

- **Reseeding & Fertility**
  - To maximise grass yields
  - Drumbo, Astonenergy, Chieftain mix
  - Fertiliser: 4 bags of 10:10:20/ac
  - Lime: 2 bags of gran lime/ac

- **Farm Roadways & Paddock Layout**
  - To increase grazing efficiency
  - 190 m of roadway, 4 m wide
  - 8 x 0.73 ha/1.80 ac paddocks
Costs (€/hectare)

- Land Drainage = €1,670
- Reseeding/Fertility = €865
- Roadways = €740
- Fencing = €400
- Water supply = €175
- Total = €3,850

Expected Benefits

- Increased grass production & quality
- Longer grazing season
- Increased grass utilisation
- Improved access for stock/machinery
- Reduced feed costs

Return on Investment

- Total Cost = €3,850/ha
- Required to justify investment:
  - Finance costs = €75
  - Depreciation rate = €190
  - Target Minimum ROI = €385
  - Total = €650

Each T DM utilised yields €105/ha

Increase in utilisation of 6.2 T/ha required to yield 10% ROI.
Land Drainage Design

Problem Diagnosis
• Soil Test Pits - at least 2.5 m deep
• Design varies with soil type
• Water enters through permeable layers
• Other layers need help

Shallow Drainage System
Mole/Gravel Mole drain/Subsoiling:
• Aim to fracture and crack the soil
• Effectiveness depends on:
  • Soil clay/stone content
  • Implement used
  • Weather conditions
• In tandem with collector drains

Groundwater Drainage System
Conventional or deep pipe drains:
• Where certain will transmit water
• Where water can percolate to water table
Land Drainage Systems

- **Mole Drainage**: 90 cm depth

- **Gravel Mole Drainage**: 90 cm depth (Gravel layer 60 cm thick, total 150 cm)

- **Groundwater Drainage**: 170 cm depth (Gravel layer 45 cm thick, total 215 cm)
Groundwater Drainage

- 1050m of field drains
- 1.8-2.0 m deep
- Backfilled with 60 cm of stone
- 240m of open drain deepened

Costs

- Field drains: 1,050m x €9/m: €9,450
- Open Drain: 240m x €4.5/m: €1,080
- Total: €10,530
- Total/ha: €1,670
Water system infrastructure

Maintaining water supply

- Good water supply is vital
- Supply to paddocks dependent on:
  - Water source and pumping capacity
  - Pipe sizes and layout
  - Jet size at ballcock
  - Trough capacity

Impact of Pipe Size

- Pressure loss in small pipe sizes
- Pressure loss is proportional to pipe length
- Flow area of ¾” pipe is 2 times that of ½”
- Flow area of 1” pipe is 4 times that of ½”

Cattle water intake 10 - 15 litres per 100kgs body weight per day

Main pipe layout Ring/Loop system preferable

Trough size Allow 5-7 litres/LU

Impact of ballcock jet size

<table>
<thead>
<tr>
<th>Jet type (pressure)</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet size (inch)</td>
<td>3/8”</td>
<td>1/4”</td>
<td>1/8”</td>
</tr>
<tr>
<td>Flow Rate (l/min)</td>
<td>42</td>
<td>32</td>
<td>8</td>
</tr>
</tbody>
</table>
Reseeding – Grange

<table>
<thead>
<tr>
<th>Reseeding</th>
<th>€/acre</th>
<th>€/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Sampling (1 sample/5 ha)</td>
<td>€40</td>
<td></td>
</tr>
<tr>
<td>Spraying (incl. Contractor)</td>
<td>€29.35</td>
<td>€72.50</td>
</tr>
<tr>
<td>Ploughing (€25/ac)</td>
<td>€110</td>
<td>€272</td>
</tr>
<tr>
<td>Till (€25/ac) tilled twice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sowing (€25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertiliser</td>
<td>€86</td>
<td>€212</td>
</tr>
<tr>
<td>Rolling</td>
<td>€10</td>
<td>€25</td>
</tr>
<tr>
<td>Grass Seed</td>
<td>€70</td>
<td>€173</td>
</tr>
<tr>
<td>Lime</td>
<td>€16.50</td>
<td>€40.60</td>
</tr>
<tr>
<td>Post-emergence spray (incl. Contractor)</td>
<td>€28</td>
<td>€70</td>
</tr>
<tr>
<td>Total Costs (incl. soil sampling)</td>
<td>€350</td>
<td>€865</td>
</tr>
</tbody>
</table>

- Soil sample
- pH 6.7
- P 1.1 mg/l 1 Index
- K 61.6 mg/l 2 Index
- pH 6.4
- P 2.4 mg/l 1 Index
- K 62.1 mg/l 2 Index

- Spray-off old sward (Roundup-flex 4.5l/ha €45/ha)
- Seedbed preparation
- Variety selection
  - 6kgs Drumbo
  - 6kgs Astonenergy
  - 1 kg Chieftain
- 4 bags of 10-10-20/ac applied to seedbed
- Sowing date 1st of May
- 2 bags of Granulated lime/ac before establishment 8th of May
- Post-emergence Spray