

Upgrading Roadway Infrastructure for Landfills

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Introduction

1. Design basics

Surface materials, traffic assumptions, geotech, and design life.

2. Landfill realities

Phasing, drainage, settlement, mixed traffic, and operations.

3. Case studies

Scalehouse, cell access, roundabout, and phasing examples.

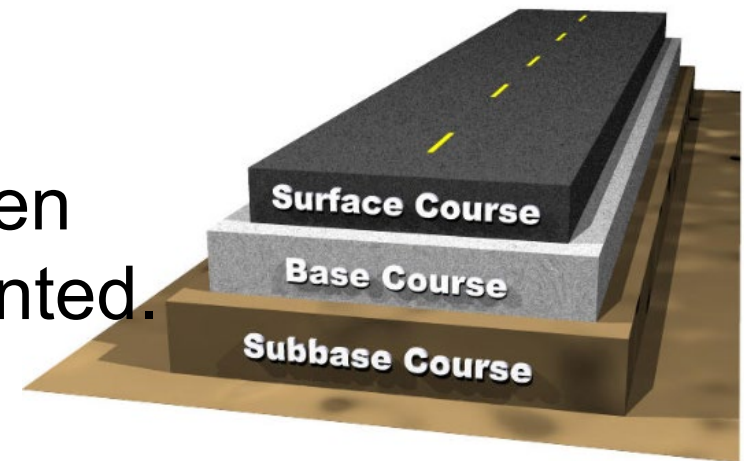
Why Landfill Roads Deserve More Attention

- Access roads control safety, throughput, and emergency response.
- Poorly planned roads can easily become a daily operational struggle.
- Roads should be planned for today's traffic, tomorrow's filling sequence, and long-term facility access.

Plan the road like it is part of the landfill system - because it is.

Upgrade $\neq$ Pave Everything

- Temporary / aggregate roads: flexible and cheaper, but higher maintenance.
- Permanent / paved roads: more reliable, but only justified when the alignment is stable.
- Most performance problems start below the surface course.
- Fix drainage and subgrade first; then decide whether pavement is warranted.



What Triggers a Roadway Upgrade?

- Increased tonnage or truck traffic
- New cell construction or changed filling sequence
- Chronic wet-weather rutting or maintenance
- Citizen/commercial traffic conflicts
- Scalehouse queueing or bypass needs

Cell-Filling and Sequencing Plans

- Working face, haul routes, and drainage patterns change over time
- Tractor-trailer access and dump locations
- Road settlement if built over waste
- Access roads above drainage high water levels

Common Pitfalls to Consider

Undersizing for Actual or Future Truck Loading

Poor Drainage/Undermining

Poor Subgrade Conditions

Treating Temporary Roads as Permanent

Turning Radius & Design Speed

Road Placement vs Master Planning

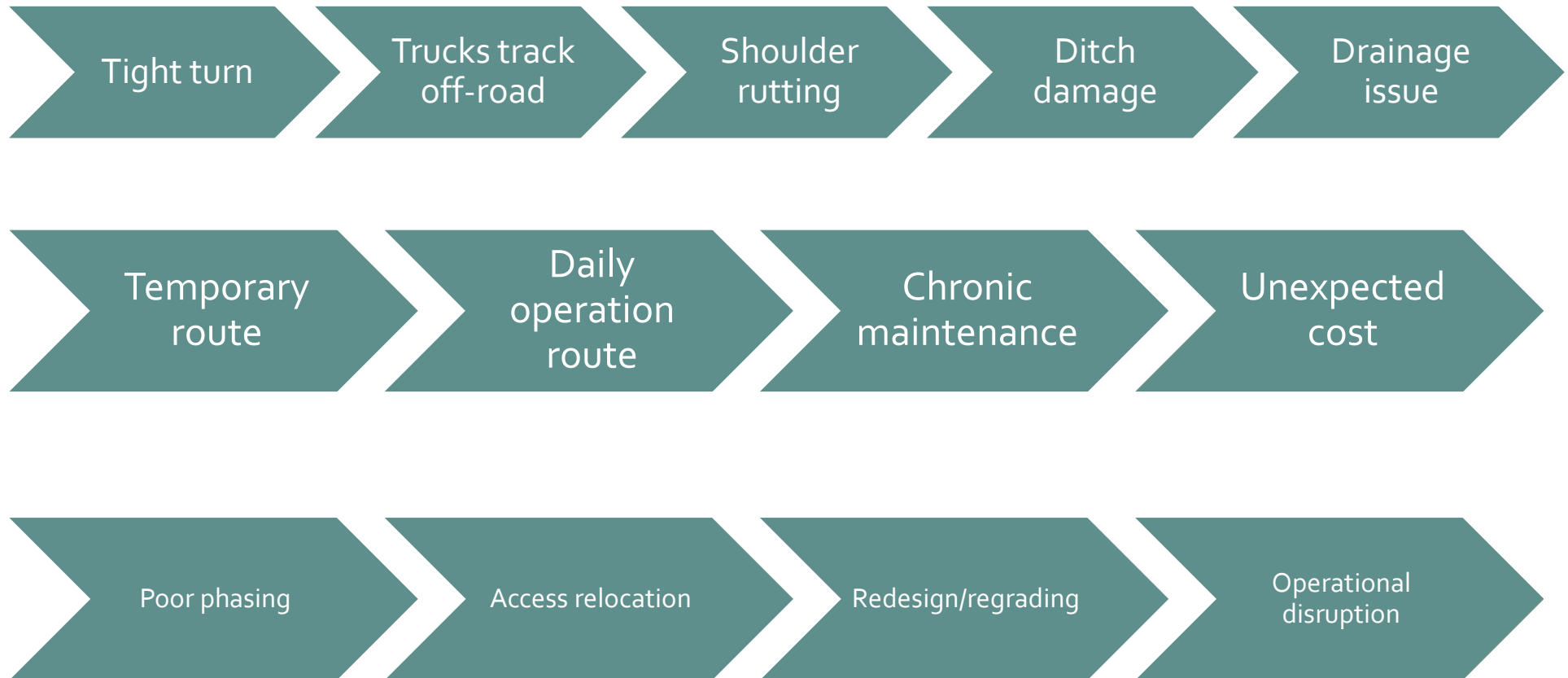
Roads “Fail” Before They Fail

Early warning signs:

- Repeated grading in the same location
- Rutting after normal rainfall
- Trucks avoiding certain areas
- Standing water at low points
- Drivers needing wide turns outside the intended road
- Informal “goat paths” forming around the designed route

Most major problems begin as a minor operational issue; don't ignore the signs!

Small Planning Misses Become Big Operational Problems



Matching the Upgrade to the Problem

Roadway Issue	Likely Upgrade
Rutting after rain	Drainage, subgrade stabilization, geogrid, thicker aggregate
Dust complaints	Surface treatment, asphalt, watering plan, speed control
Queueing at scalehouse	Bypass lane, extra stacking length, lane assignment
Trucks tracking outside road	Widening, larger radius, AutoTURN review
Citizen/commercial conflict	Separated circulation, signage, striping, access control
Repeated shoulder failure	Shoulder stabilization, edge restraint, ditch relocation
Stormwater conflict	Regrade road/swales, culverts, ERP review
Future cell access issue	Road relocation/phasing plan

Upgrade the Geometry, Not Just the Surface

- Confirm loaded tractor-trailer paths with AutoTurn (or other tools)
- Confirm emergency, utility, and citizen access
 - Separate Citizens where feasible
- Design for the vehicles that actually use the site
- Max. Running Slopes for Operations e.g. 5-7%

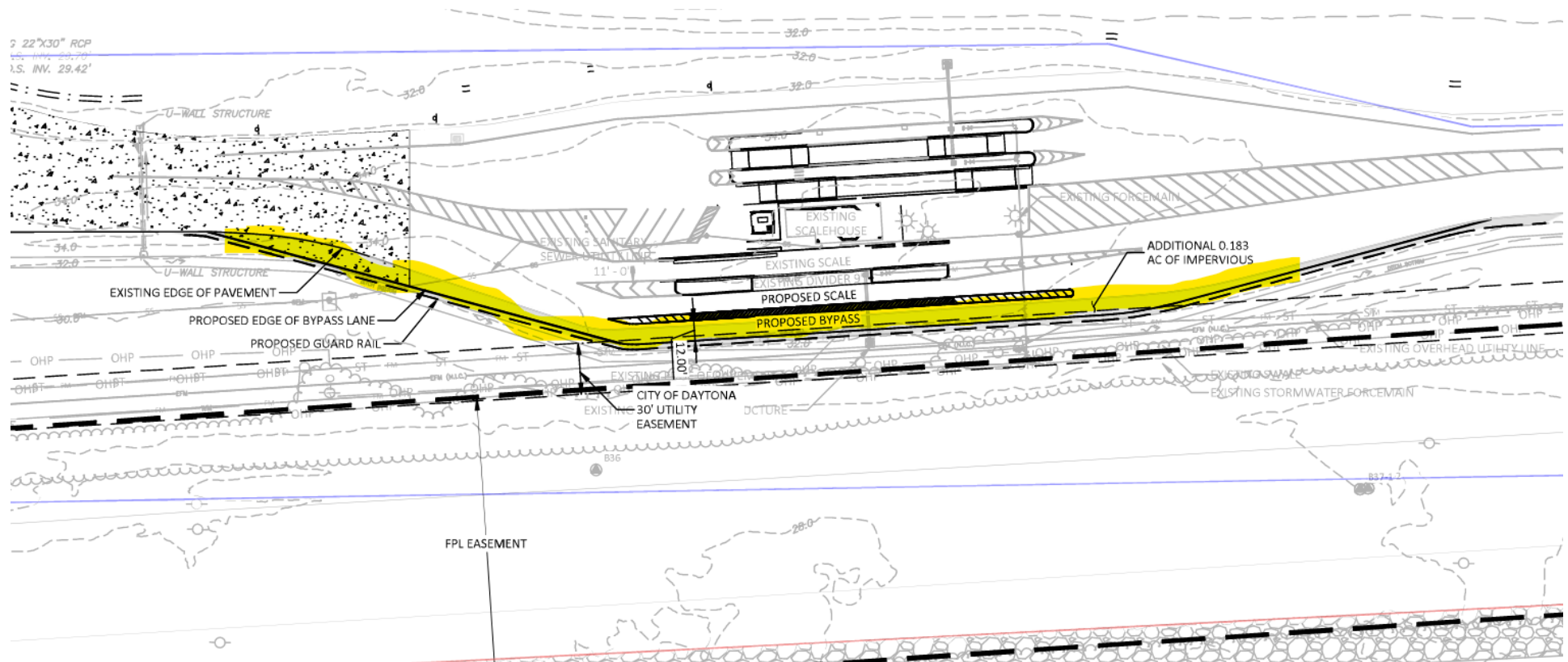
Drainage Can be the Upgrade

- Keep stormwater away from the road section
- Avoid ponding and soft shoulders
- Protect leachate/stormwater separation
- Check ERP impacts when grading changes

Constraints That Shape the Final Roadway

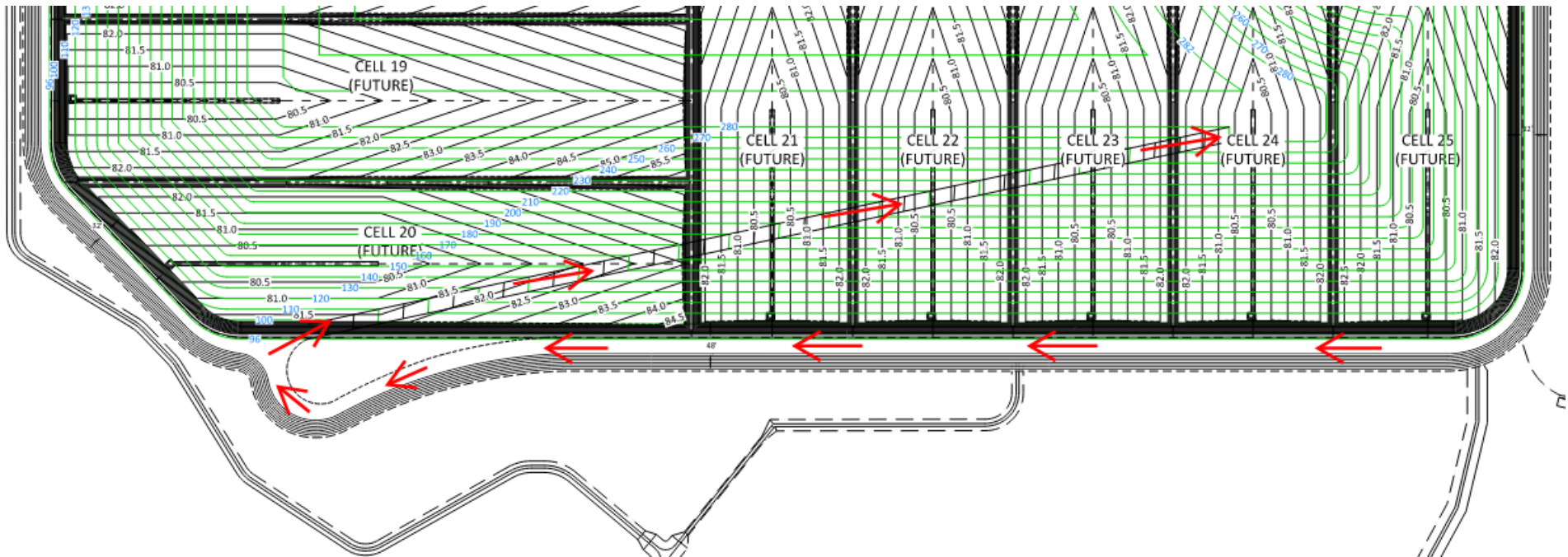
- ADA/Sidewalks/Citizen Access
- Easement Regulations (e.g. FPL, Utilities etc.)
- State DOT Design Manuals
- MUTCD (signage) and local/County guidance
 - Signage is often overlooked
- Cost & Constructability

Scalehouse Bypass Plan Example 1



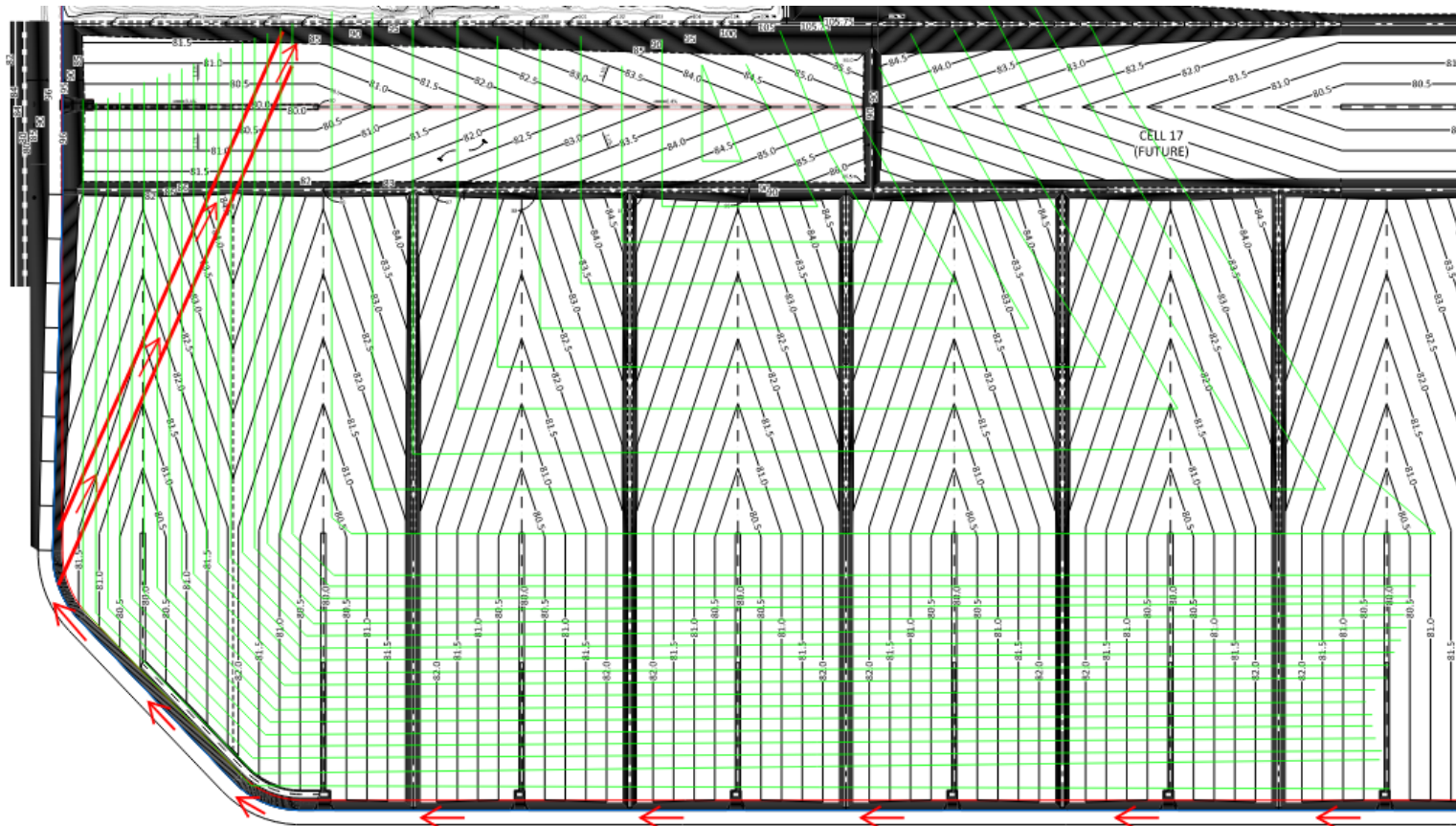
Landfill Cell Access Design Example 1

- Required Cell filling sequence requires a near 180-degree turn to get up slope
- Larger Turn radius required/possible traffic queue
- Reduces footprint of perimeter drainage ditch

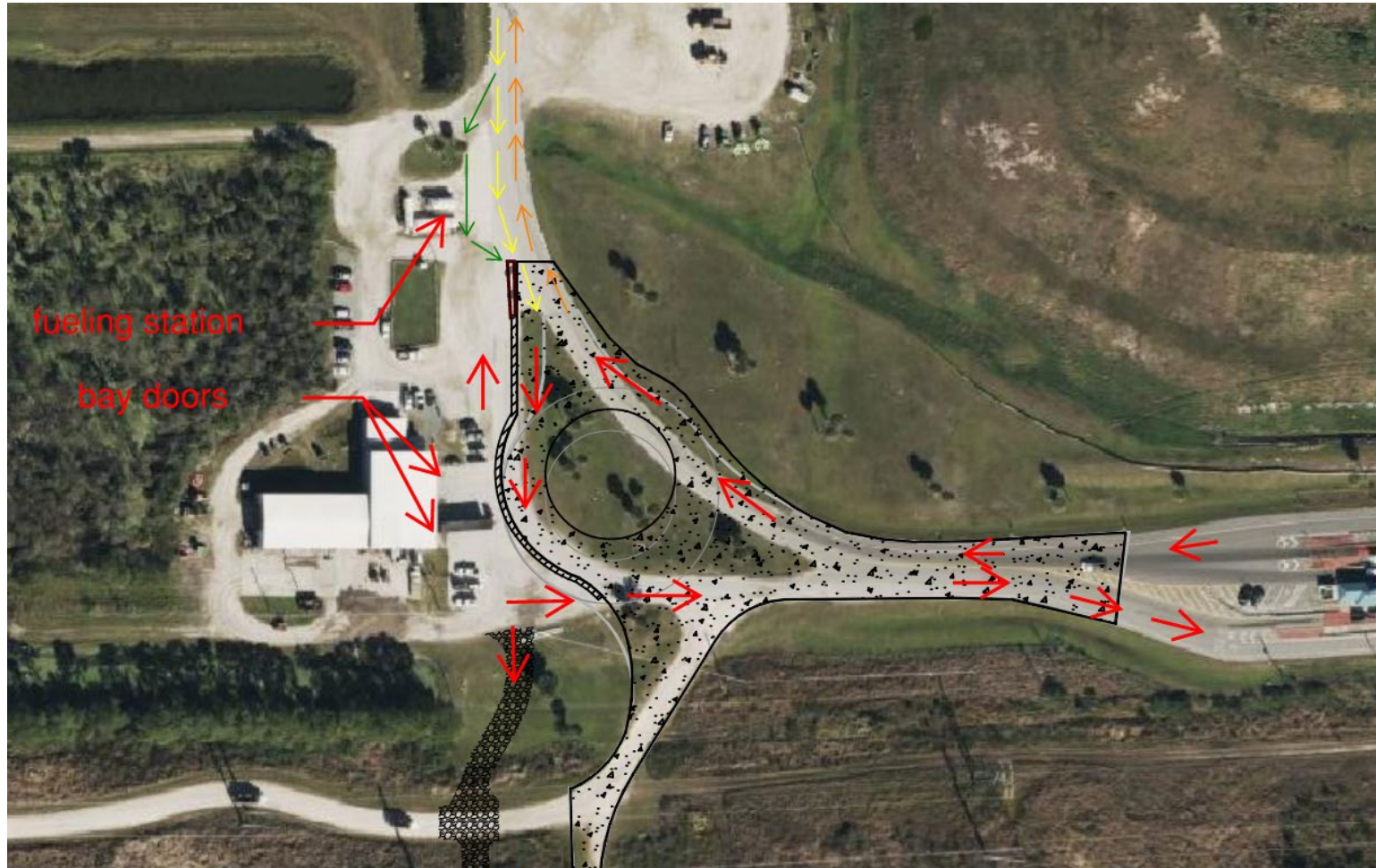


Landfill Cell Access Design Example 2 (Improvement)

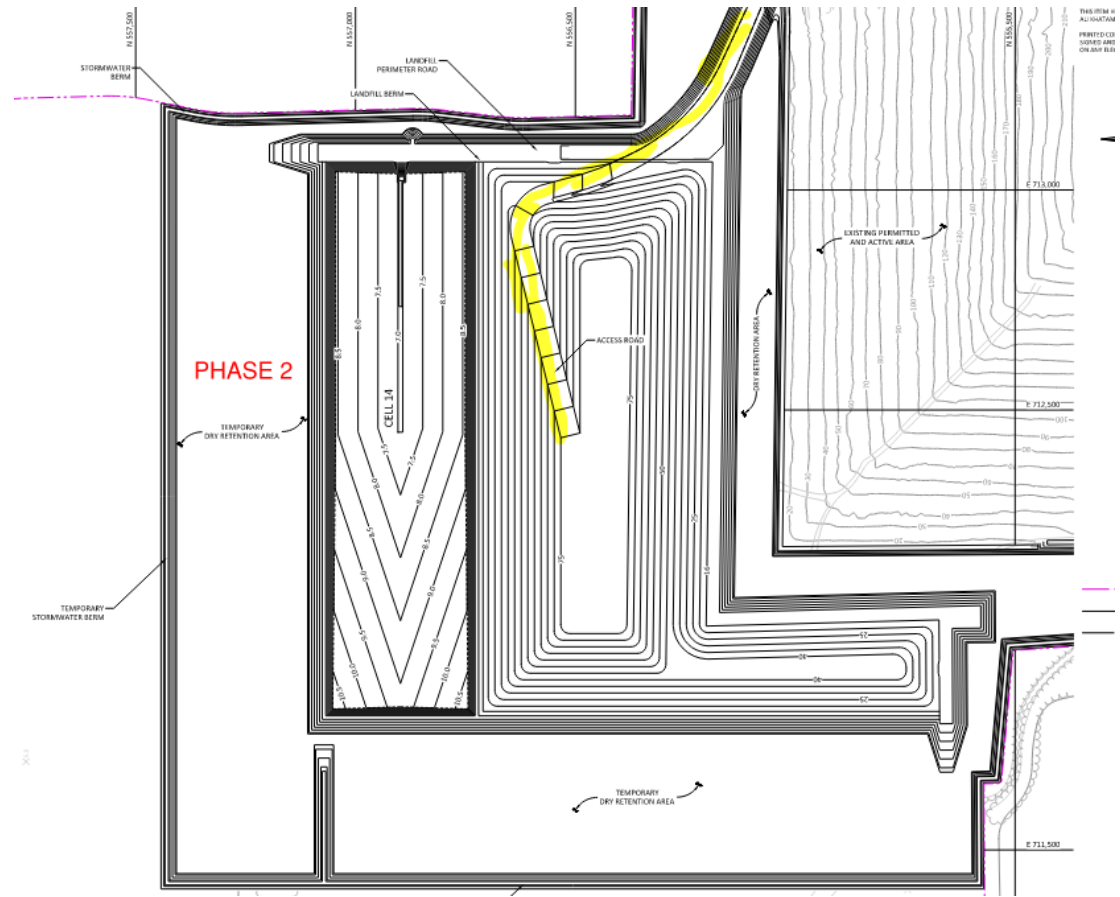
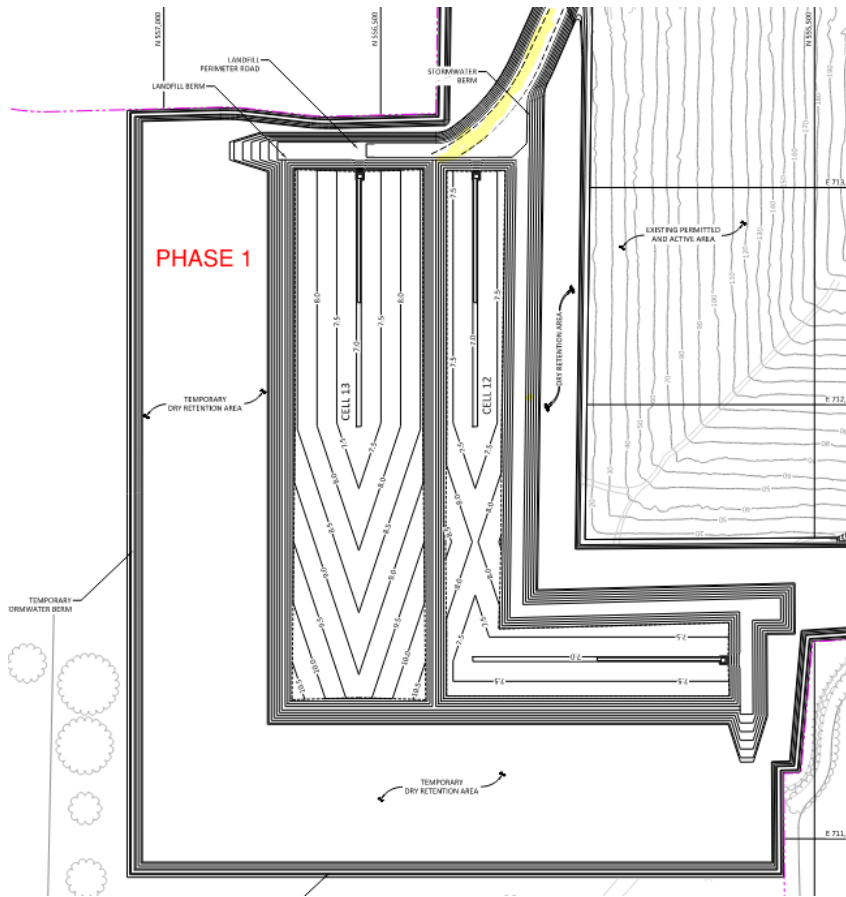
- Modified Cell design and filling sequence
- Smaller turn radius/ease of traffic



Roundabout Design Example



Cell Phasing Road Example: Phase 1-2



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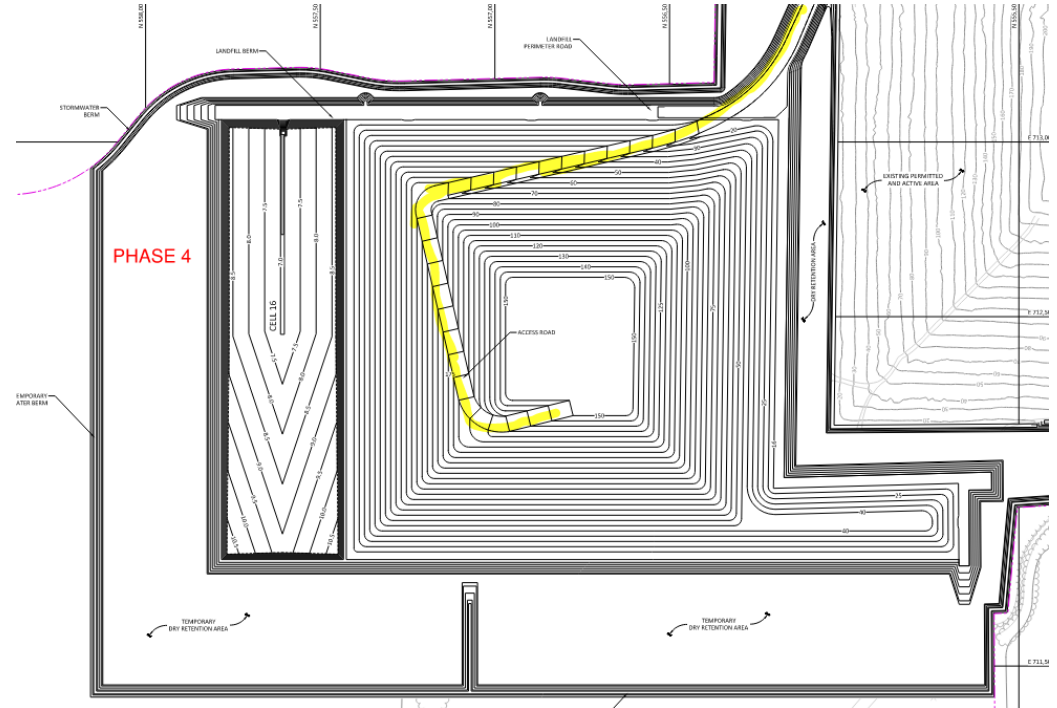
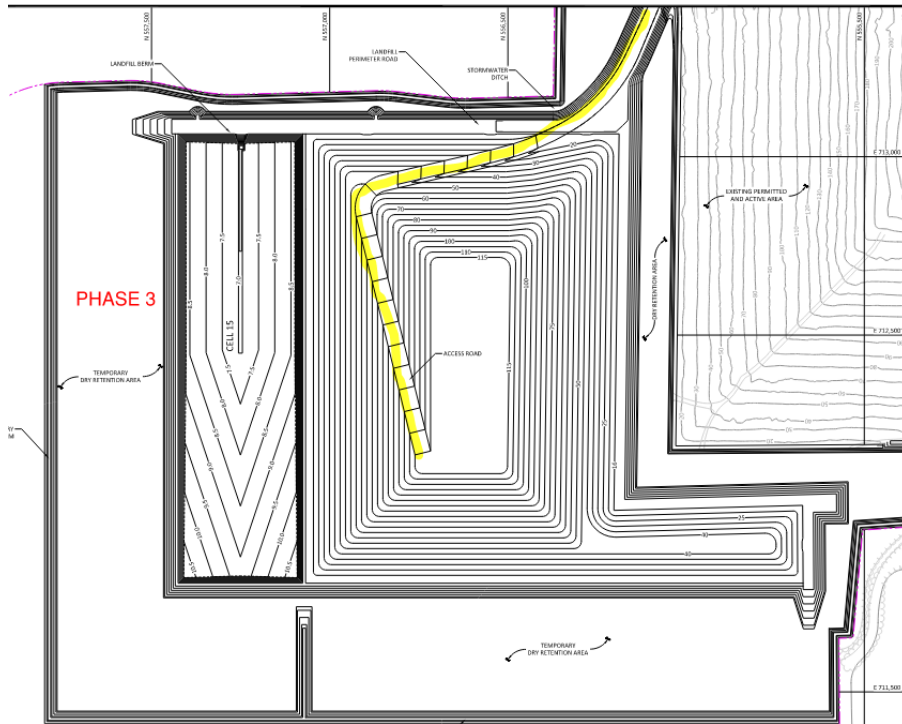
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Cell Phasing Road Example: Phase 3-4



Conclusion and Q&A

Key Takeaways

- A roadway upgrade should solve the operational problem, not just improve the surface.
- Drainage, subgrade, geometry, and phasing usually control long-term performance.
- Temporary landfill roads often become permanent maintenance problems.
- The best upgrades are planned with operators, engineers, and future cell development in mind.

Questions?