NJM Hammonton Regional Operations Facility

NJM Insurance Group

FDR

b a Burgis Associates, Inc.

L2A Land Design / LLC

The Gale Construction Company LLC

Princeton Hydro

pH

A site with sustainability in mind

3rd Floor Fit-out qualified as LEED Silver

Sites
- Brownfield Redevelopment
- Water quantity
- Water quality
- Heat island effect reduction
- Light pollution reduction

Water Efficiency
- Potable water use reduced by 34%

Energy and Atmosphere
- Connected lighting power reduced by 35.5%
- ENERGY STAR = 92.5%
- Enhanced commissioning

Materials and Resources
- 80.3% of construction materials recycled (diverted from landfill)
- 22% of construction materials constructed from recycled materials
- 26% of construction materials manufactured within 500 miles

Indoor Air Quality
- ASHRAE Standard 62.1-2007
- No smoking on property
- Construction IAQ Management Plan
- Low-emitting materials (paints & coatings, flooring, wood and agrifiber, furniture and seating
- Thermal comfort

From concept to reality

concept

design

reality

Site Layout and Constraints

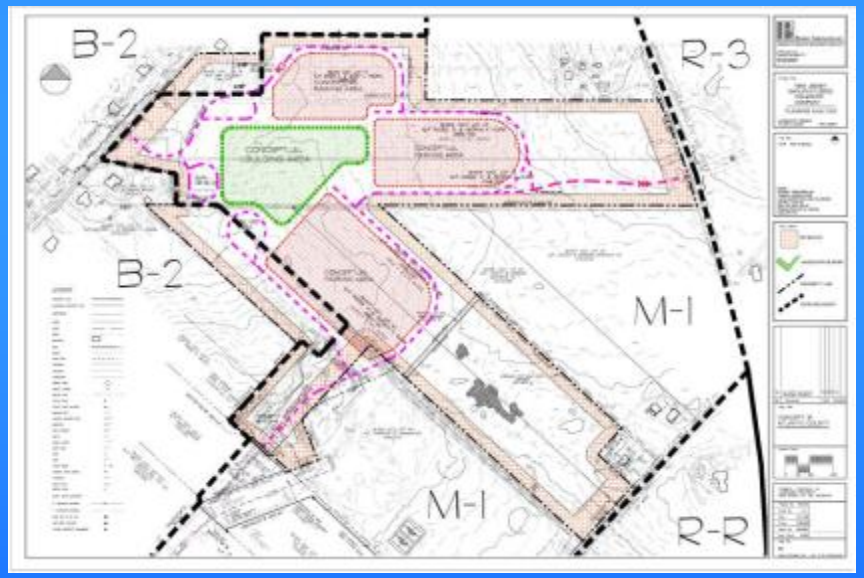
- 55-acre site.
- Historic peach orchard (remediated for historic pesticides, 26,000 cy removed from the site).
- Adjacent to historic gravel mine.
- Limited stormwater infrastructure in vicinity.
- Within the NJ Pinelands.
- Required to infiltrate difference between 10-year pre- and post-development runoff.

Historic Pesticides

- NJM first remediated site to the residential standard.
  - Historic peach orchard
  - Dieldrin and arsenic contaminated soils
  - Removed 26,000 cubic yards of soil

Look into site's ability to manage stormwater

- Client did something that should be considered by others:
  - Asked us to determine the maximum area of impervious cover that the site could handle in relation to the regulations.
  - Then backed into zoning to see what size building they could construct.



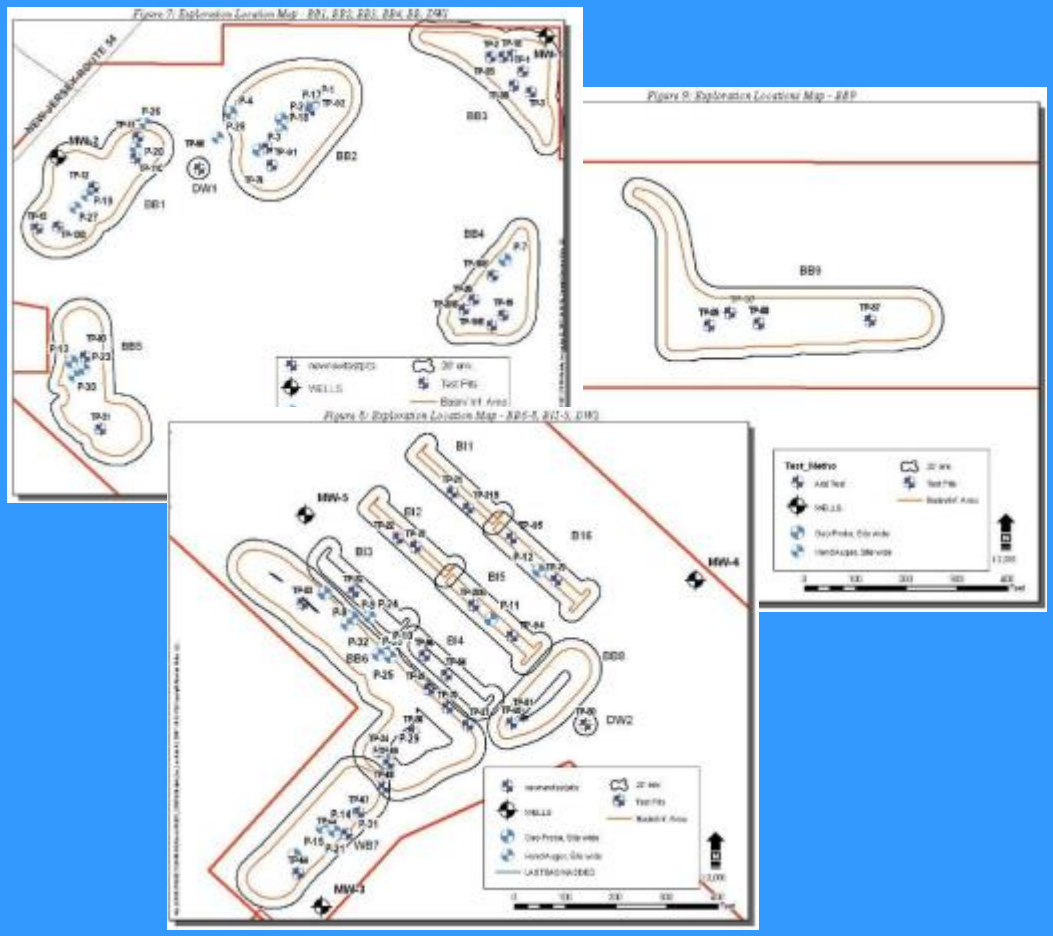
Conducted appropriate on site testing

- Desktop review of on-site soils
  - Aura soils limitations revealed
    - Clay bridging between soil particles
    - Fragipan located between 22 and 60 inches.

Field Work

- Test pits and borings followed a 2 step process:
  - Step 1: General investigation to determine appropriate locations for basins and other facilities
  - Step 2: BMP Specific Investigation
- Installed 5 wells on site to assess regional groundwater and fluctuations

Data Reviewed



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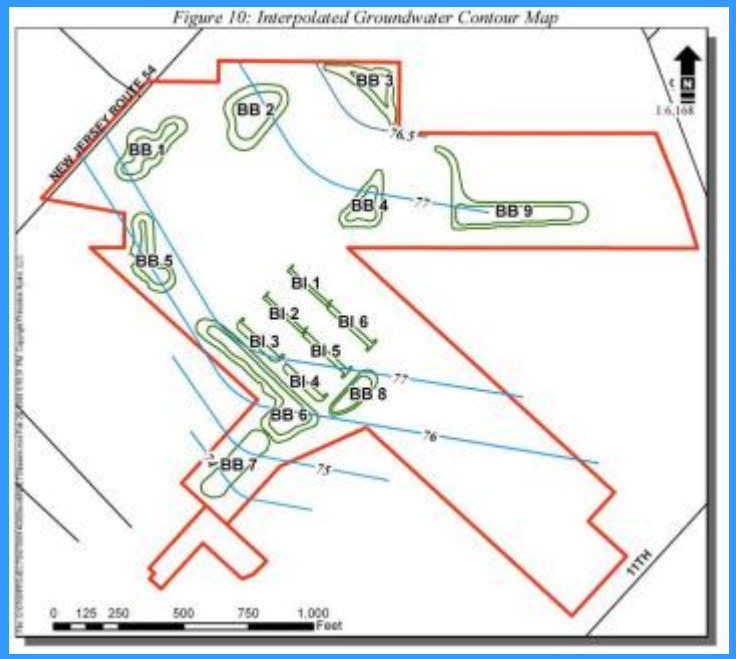

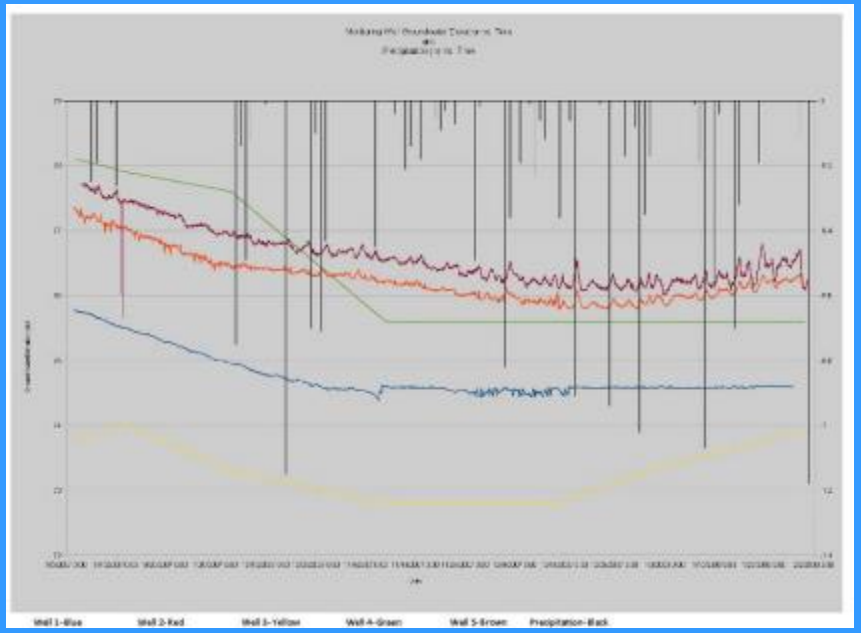

Final Layout and Integration of BMPs

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8 Bio-Infiltration Basins

1 Wetland Basin

6 Bio-Infiltration Islands

1 Bio-Retention Swale

Roof rainwater harvesting (120k gallons)

(Phase II) Pervious pavement

Meadow creation/preservation

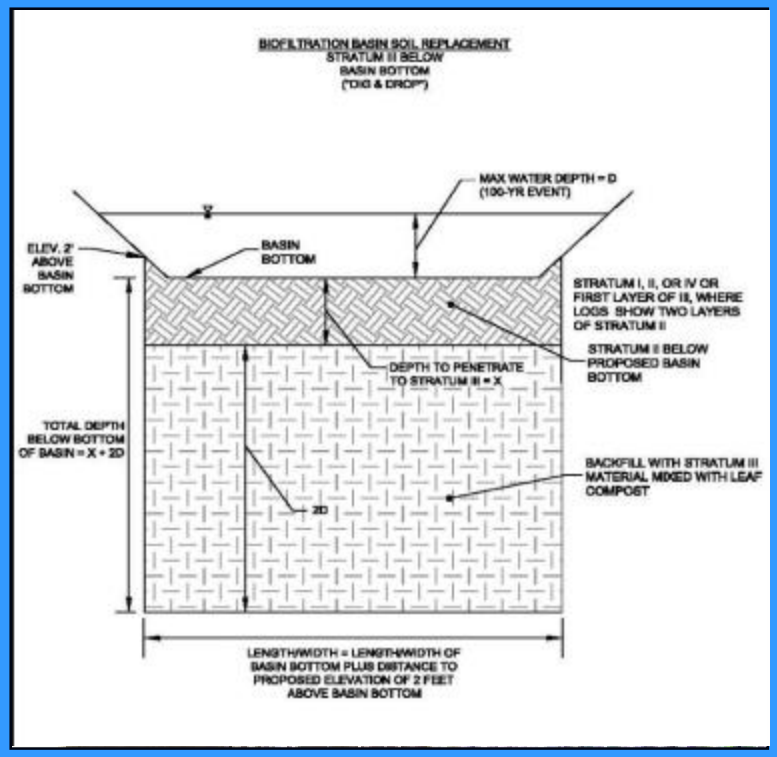
Addressing at the source

- Seepage pit/sumps for pre-treatment

- All areas disturbed to remain non-impervious were roto-tilled and where necessary, compost amended.

Proposed Methods for Preparation of Infiltration Zones

- Need to break-up clay bridging and layers.
- Need to penetrate soils with fragipans.
- Need to reduce bulk density of infiltration zones to achieve higher permeability rates and increase temporary subsurface storage.
- Need to understand underlying aquifer.
- Mounding Analysis was critical in determining effectiveness of infiltration areas.



Solutions for Preparation of Infiltration Zones

- Excavate and remove all fragipans and materials classified as clayey sands and silts.
- Dig and drop all areas to a depth of 2x maximum expected water depth and at least 2x water depth into underlying sandy stratums
- Top 3 feet mixed with organics (i.e. whole leaf/fine leaf composite).

Infiltration can be optimized by excavating and backfilling the subgrade to a depth of 2 times the expected maximum water depth in the basin.

Remove deleterious soils

Deliver organics

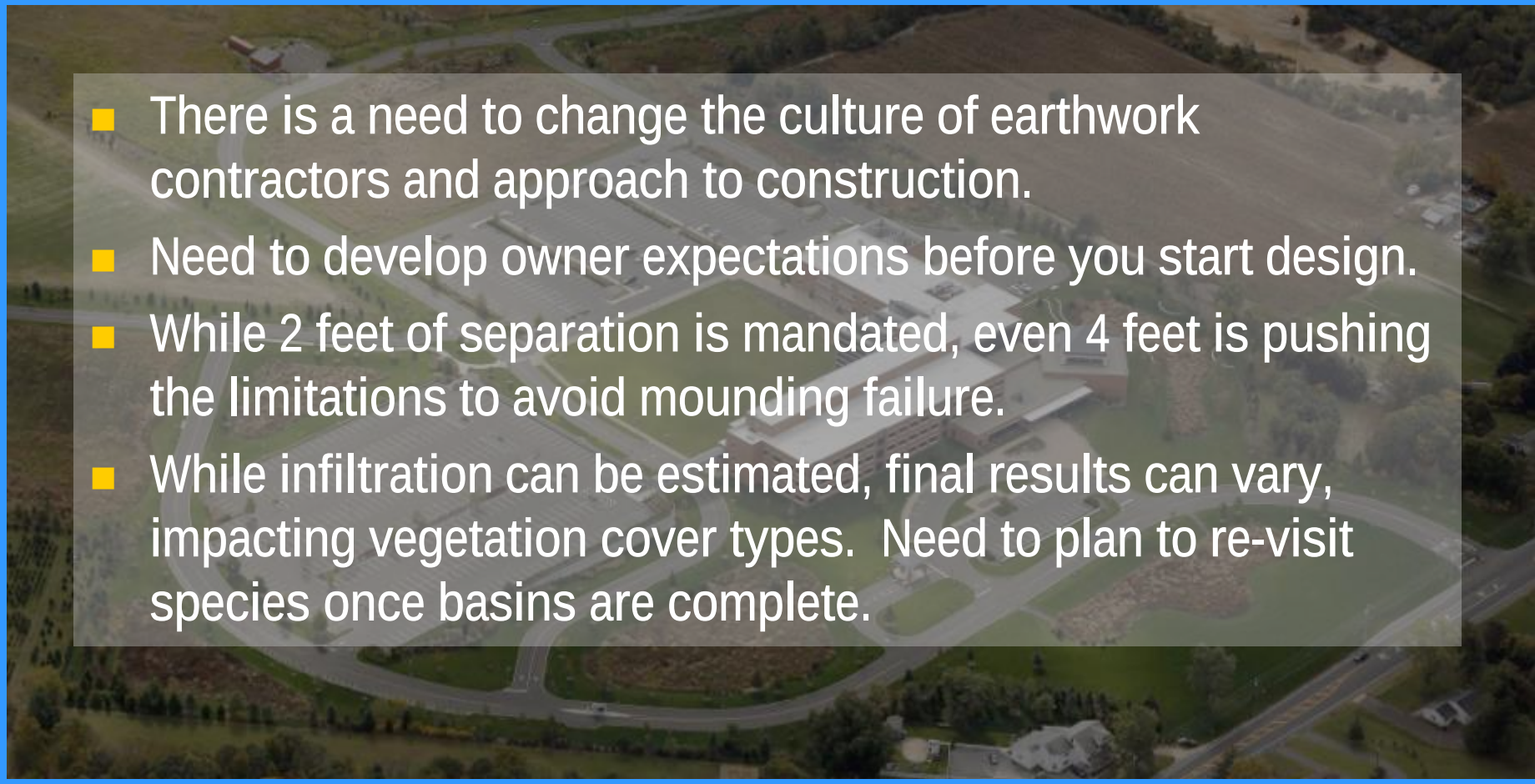
Spread organics

After deep mix, mix in organics to 3 feet

Test to ensure infiltration rate goals

120,000 gallon cistern to collect roof runoff and use for landscape irrigation

Lessons Learned



- There is a need to change the culture of earthwork contractors and approach to construction.
- Need to develop owner expectations before you start design.
- While 2 feet of separation is mandated, even 4 feet is pushing the limitations to avoid mounding failure.
- While infiltration can be estimated, final results can vary, impacting vegetation cover types. Need to plan to re-visit species once basins are complete.

From concept to reality

concept

Now let's take a walk

design

reality