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Landfill sites are becoming more realistic for redevelopment

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What was once an untapped resource, due to the challenges and costs associated with cleanup, regulations and specialized construction requirements, is now becoming a feasible venture for municipalities and developers alike. Landfill sites are gaining in popularity and providing a profitable real estate venture to cities, towns and redevelopment professionals who are taking the time to discover and implement realistic solutions.

Throughout the years, developers have had to forego properties in highly desirable locations because the property was on a landfill. What made perfect sense in terms of visibility and public access couldn't "pencil" due to the extreme costs and high standards associated with regulations, and health and safety requirements. Therefore, the land would sit idly by without ever realizing its full potential and value.

That has changed in recent years due to the willingness of municipalities and developers to form partnerships and work together on cost, cleanup and construction solutions. Likewise, landfill specialists have continued to evolve and provide a wide range of services that can help make even the most challenging landfill site a development reality.

Landfill sites come in three main types. The first is construction and demolition, which includes primarily inorganic waste from construction or old building sites. The waste found here might include bricks, wood, roofing material, cement and other materials common to a building that has been demolished. The second type of landfill is a municipal solid waste site. This form of landfill is the resting place of all the standard garbage and organic materials a public works department dumps on behalf of the general public. A major challenge with this form of site is the methane gas that's generated by the organic materials as they rot and waste away. The third type of landfill is a hazardous waste site. These are far more rare and problematic from a health and regulatory standards perspective.

For developers who are considering a landfill site for redevelopment, there are some obvious and not-so-obvious things to be considered. For example, is the value of the land sufficient to justify extraordinary foundation construction costs associated with traditional buildings, or is it better suited for low load-bearing uses? Because all landfill sites are susceptible to settlement, that too must be a key consideration, as does the amount of methane being generated. The redevelopment of landfill sites with large amounts of settlement and/or methane might include a soccer field or "bright field" (for solar panel use) that either provide a great community resource or a revenue generator for energy uses.

Even if a site is likely to experience movement or subsidence as materials degrade, professional experts are providing solutions that can make a vertical construction project a reality and maximize a property's profitability. Some of the more extreme challenges and solutions that design professionals and remediation experts are accounting for include:

■ **Subsidence.** As organic materials dissolve and degrade, they collapse and create havoc for building foundations, parking lots and infrastructure. The settling ground isn't stable for new construction, however, some practical solutions are being executed successfully at a number of these sites. Drilling pilings into bedrock or competent soils, underneath the landfill materials, provides builders with the ability to build a solid foundation and is the surest method of mitigating the effects of settlement on the structure. Various forms of ground improvement, including surcharging, or dynamic or vibratory compaction, may be employed to minimize settlement and, in the case of shallow foundations or low load-bearing uses, may provide a sufficiently strong supporting layer of earth to build on.

■ **Landfill gas.** Methane and other hazardous gases are another outcome of degrading organic materials, resulting in health and safety hazards. These gases must be managed in any type of active use of a landfill property. Sub-slab depressurization, and gas collection and ventilation systems (similar to those that control radon) are used to vent landfill gases and meet regulatory standards.

■ **Utilities and infrastructure.** Landfill redevelopment experts are able to plan and engineer design solutions so that utilities are protected from damage caused by the waste materials. Such damage may be from differential settlement or from the corrosive properties of the waste material. Likewise, solutions are also being provided so the surrounding infrastructure (such as sidewalks, light poles, and curb and gutter) are stable and won't be damaged.

■ **Operations and maintenance plans.** If not properly addressed at the outset, repair work to structures on a landfill redevelopment project can cost tens of thousands of dollars. By establishing an operations and maintenance plan early in the process, a development team can project costs and identify the challenges that should be addressed at the start of construction.

■ **Regulations.** Every landfill site is regulated to some degree by local, state and/or federal agencies. Understanding the regulations is oftentimes like getting through a maze, and can come in different forms (such as State Solid Waste regulations, the Federal Resource Conservation and Recovery Act, and local requirements regarding the permitting, sampling, monitoring and reporting of a landfill site).

While landfill redevelopment does offer very unique and often complex challenges, developers are finding great opportunities on these sites. Municipalities are also getting actively involved by making land contributions, offsetting some of the costs and even becoming involved in public-private partnerships. All of these efforts are turning once forgotten parcels of land into viable properties for redevelopment. ▲