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SUBJECT: **Industrial Sites – Design Guidelines**

Many public officials dream about conducting a press conference where they announce a major industry just decided to locate within their community. These dreams occur more often with officials who draft land use plans for industrial development.

Many factors go into a decision regarding where to locate a particular industry. Communities need to know their strengths and weaknesses. They also need to get ready to provide real estate solutions to prospective developers through land use planning.

The suitability of a site will vary between companies and industries. Some industrial land uses depend greatly on a specific requirement (e.g., rail or port access, gas lines, interstate highways and electrical power). Nonetheless, some common standards exist.

A review of various criteria used around the state generates the following general standards. This list is not all-inclusive. I provide it solely for the sake of discussion. Actual requirements will among different types of industries as well as among communities.

- **Available Acreage:** Industrial developments tend to have low floor-to-area ratios (FAR). A review of sites around the Puget Sound found a FAR ratio of approximately 35 percent. The average building size was around 30,000 square feet. Each building needs another 86,000 square feet (nearly two acres) for outside storage, loading/unloading and other uses. The amount of acreage may increase to accommodate on-site storm drainage, open spaces and landscaped buffers.<sup>1</sup>
- **Configuration (square / rectangular preferred)** – Square or rectangular sites offer the greatest flexibility and satisfy most uses.
- **Zoning (e.g., industrial, mfg., etc.)** – Areas designated for industrial land use (i.e., industrial zones) the marketability of the site. It decreases transaction costs by removing variables, such as rezoning, that cost time and money. Zoning also demonstrates a community's support for industry and the types of industry they want to attract.

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<sup>1</sup> Source: Puget Sound Regional Council, "Industrial Land Supply and Demand in the Central Puget Sound Region", (February, 1998)

- **Type of Industry (e.g., light or heavy industrial zones)** – Locating in a designated area which the permitted uses include the intended project means the sites either has the required infrastructure (e.g., utilities, emergency response, etc.) or at least the ability to provide it as part of the development process.
- **Access:** Access to major modes of transportation continues to dictate where most types of industries will locate. At a minimum, a site needs two access points for public safety reasons. More access points make the site even more attractive. The type of access also plays a role. For instance, some industries require rail and port access. Some require quick access to airports. In most cases, they require designated truck routes designed to accommodate their semi-trailers and road tractors.
- **Topography and Soil Conditions:** Industrial firms typically need level sites. They usually cover a great deal of the site with impervious surfaces; consequently, they need sites with adequate drainage to avoid standing water. Industrial sites need test boring information to determine the groundwater tables and the load capacity of the soil (e.g., Phase I environmental assessment). Manufacturing equipment requires a greater soil bearing capacity than commonly found on commercial sites.
- **Utilities:** The type of industry and the size of site improvements determine utility standards. An engineering study and site plan should detail how these services will get delivered. The following are some suggested standards that community leaders may use as a reference for technical discussions. Actual requirements will vary depending on the industry and the size of the facility.
  - **Electrical:** At a minimum, an industrial site needs three-phase electrical service. A review of design criteria from other states indicates a minimum of 12 KVA. The delivery of electrical services needs to have a high probability of uninterrupted service. For example, transmission lines to the site should originate from a sub-station that has a reasonable level of excess capacity.
  - **Sewage:** Although sizes vary around the state, most communities appear to require a minimum of an eight-inch sanitary sewer line. Many industries require pressurized sewer lines, which require special piping and fittings. The site may need additional space for on-site wastewater treatment. In particular, whenever an industrial or commercial business generates mineral, petroleum or non-biodegradable cutting oils; they will need to install a way to separate these contaminants from the water.
  - **Water:** The size of facility will dictate the pipe size and water pressure required. Industrial uses will require more water and higher pressures. Many sites have twelve-inch water mains with a rating of fifty pounds per square inch (psi) pressure. The water main and the elevated storage capacity should be able to meet highly productive risk

(HPR) insurance standards. Usually a fire flow of two thousand gallons per minute for four hours will meet the HPR standard.

- Storm Drainage: Since most industrial sites are large sites, they must provide permanent controls of stormwater runoff, including erosion and sediment controls. In addition to extra permitting requirements, industrial sites typically need additional space to contain, control and perhaps treat its storm drainage runoff. For example, it may need space for retention ponds and bio-swells.
- Broadband: Broadband refers to transmissions lines with the ability to transport multiple signals and digital traffic at one time. Industries depend on it for everything from payroll to banking to procurement to job recruitment. Regarding the size of bandwidth, corporate video conferencing uses bandwidth comparable to standard television requirements (3-4 megabytes per second (Mbps). Three and four way conferencing sessions increases the speed requirements even more.

### **Additional Considerations:**

Redeveloping an industrial site requires looking at a number of other requirements. In particular, brownfields undergo a rigorous environmental assessment. They must also look at potential impacts to archeological and historical sites or artifacts. They consider impacts to endangered species. They prepare plans regarding on-going monitoring.

Fortunately, Washington has a large number of former brownfields sites that now serve as industrial sites. It has a number of great examples from which to see how to do it.

The State of Nebraska published a guidebook titled --"[Industrial/Business Park Standards](#)." It is available online. Its appendix includes design standards for particular industries.

Puget Sound Regional Council provides several reports with valuable information industrial development, employment and site characteristics. They periodically analyze industrial lands around Central Puget Sound. Their reports and other information are available online at [www.psrc.org](http://www.psrc.org) .

### **For More Information:**

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