



Amended Preliminary Land Development Plan

The Pittsburgh Technology Center

LAQUATRA BONCI ASSOCIATES
 LOYSEN + KREUTHMEIER ARCHITECTS

WITH
 THE GREEN BUILDING ALLIANCE
 Updated by Urban Redevelopment Authority
 Indovina Associates Architects

September 2020

PRELIMINARY LAND DEVELOPMENT PLAN

Master Plan & Design Guidelines Update for Pittsburgh Technology Center

Pittsburgh, Pennsylvania

August 2020



Prepared for:

**Urban Redevelopment
Authority of Pittsburgh**

Prepared by:

LAQUATRA BONCI ASSOCIATES
landscape architects & urban designers

95 South Tenth Street
Pittsburgh, Pennsylvania
412.488.8822 tel
412.488.8825 fax
www.laquatrabonci.com

LOYSEN + KRUETHMEIER ARCHITECTS
architects & urban designer

5115 Penn Avenue
Pittsburgh, PA 15224
412.924.0006 tel
412.924.0007 fax
www.LK-architects.com

updated by:

Indovina Associates Architects
Urban Redevelopment Authority of Pittsburgh

In Association with:

Green Building Alliance
Pittsburgh, Pennsylvania

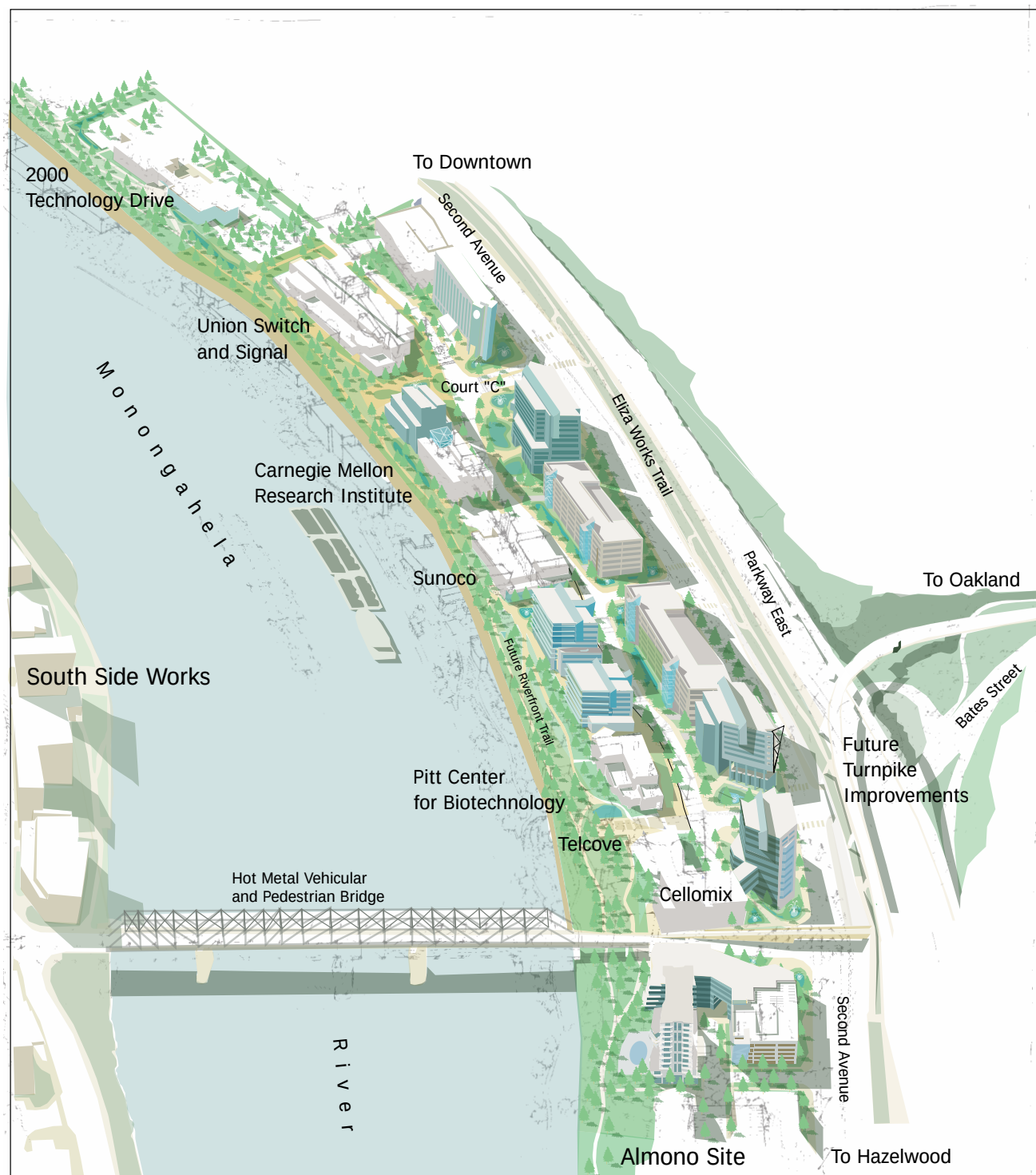


PRELIMINARY LAND DEVELOPMENT PLAN

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Pittsburgh Technology Center PLDP

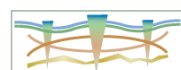
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Pittsburgh Technology Center Expansion

Aerial Perspective Sketch

Looking North Downstream towards Downtown



ACKNOWLEDGEMENTS

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s e c t i o n

A

G E N E R A L G U I D E L I N E S

20th Century History

Over the past thirty years, the City has focused on the continuing development of The Pittsburgh Technology Center which is considered to be the region's center for the development and application of advanced technologies. Here, the regions technology institutions, both the University of Pittsburgh and Carnegie Mellon University, feature centers that focus on developing and applying new technologies in the fields of biotechnology, bioengineering, artificial intelligence, robotics, and computer applications. In addition, it accommodates both new and established high tech companies that are speeding research and transferring such technology to the marketplace.

The project started in 1983 when the City purchased the property from the Park Corporation. Park originally purchased the site from the Jones and Laughlin Corporation which functioned as a hot strip mill. In 1984, the ULI panel Advisory Service through its efforts established a development strategy for the site. This represented the City's first attempt at shedding its image as one founded on heavy industry to one that would focus on cutting edge research and technology

With the buildings already demolished by the Park Corporation, the URA filled the site from Second Avenue down to the railroad spur which exists now along the waters edge. That 7-10' of fill created a series of rising buildable plateaus and supported the widening by the URA of Second Avenue and allowed the construction of a gravity sewer system that supports the site.

Later in 1996, the URA constructed a new spine road called Technology Drive and a series of riverwalks, tree covered walkways, and a greensward consisting of a variety of grasses and wildflowers. The Center provided an attractively designed, high quality environment to met the need of both established and new companies involved in the development or application of advanced technologies. The original 48 acre site was designed to offer both good access and high quality open spaces in a campus like setting.

Some early developments have occurred through a strong series of regional initiatives. The first was the opening in 1993 of The University of Pittsburgh's Center for Biotechnology and Bioengineering, an 87,000sf facility, an industry affiliated research and development facility closely related to the research underway on the university's campus and health center. In 1995, CMU opened its 91,000sf home for its highly regarded Carnegie Mellon Research Institute. As a related strategy in 1996, RIDC completed construction of a 68,000sf multi-tenant building at the far western end of the site which houses a combination of high technology and industry support agencies.

Other initiatives have also moved ahead. In early 1995, the RIDC developed a 175,000sf regional headquarters facility for Union Switch & Signal Corporation to house the company's research and engineering activities. The URA developed a five level parking garage to accommodate US&S parking needs in conjunction with RIDC's building development. In 1997, Aristech Chemical Corporation completed their Polypropylene Business Unit Facility



Original Illustrative Site Plan

Recent History and Updates

In January 2001, Adelphia Business Solutions completed construction of a 30,400sf facility now called Level3, at the eastern end of PTC, between the University of Pittsburgh's Center for Biotechnology and Bioengineering and the Hot Metal Bridge. The facility houses general office space and telecommunications switching and transmission equipment.

In January 2001, the Ferchill Group completed construction of a 153,000 square foot, multi-tenant office building at the eastern terminus of the site. Cellomics, one of the region's fastest growing biotechnology firms, is the primary tenant of this facility known as Bridgeside Point. It is home for their corporate offices, wet laboratory and assembly space.

In 2004, both the City of Pittsburgh and the Urban Redevelopment Authority staff jointly convened a working session. This session convened after recognition that the PTC site was not being well accepted into the marketplace. Consensus was that the masterplan encouraged underutilization of the property and also required revision to increase its density. This required a transitional strategy from a suburban format to one that was more urban in form. In 2005, meetings occurred between the City' stakeholders which encouraged further development of the masterplan. Further feasibility planning ensued by the City Planning and URA staff along with further coordination by URA staff with the stakeholders. This resulted in an accepted draft plan which was the basis of the Amended PLDP in 2005 and further refinements in 2007.

The region's institutions were forecasting in excess of 1,000,000gsf of research and lab space over the next five to ten years. Their preference was to locate the new space in reasonable proximity to the existing Oakland area. Few sites nearby offered ready property that was needed to meet this demand.

Several factors influenced the need to add density at the site. First, there were limited financial resources for the City to provide matching funding for State and Federal grants that have served to move ahead such initiatives. Second, few sites existed which offered the proximity to the institutions which were available for development with reasonable development costs. Although the South Side Works site offers road and utility improvements, it has only one site remaining available for development. The large 180 acre Hazelwood section of the former J&L Site offered an abundance of flat land, but offered little site enhancements and was still considered quite industrial with limited access and infrastructure.

With Some minor, inexpensive changes to the existing infrastructure, the PTC site offered abundant available acreage suitable to meet the expected demand. Unfortunately, the original masterplan only afforded 300,000 sf of additional development as its plan relegated substantial area to parking decks. Further, use restrictions did not allow the full compliment of uses necessary to sustain the degree of development proposed. Accordingly, a new mixed used masterplan was created.

The URA proposed to reestablish PTC as the premier regional research and development center well into the next generation. It is planned as a more urban center with a greater degree of mixed use with a strong, quality open space system more conducive to creating a sense of place.

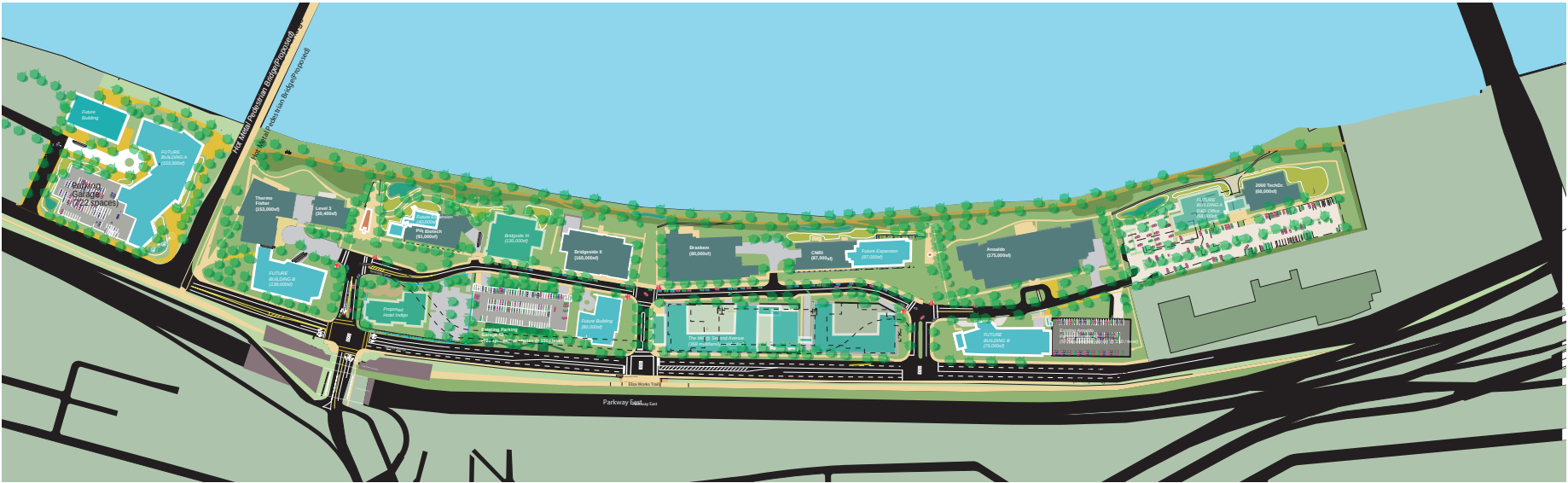
During the implementation and marketing of the 2005 approved plan, it was found that implementation of the internal Greensward complicated simple access to the parking. Further, it found that although large parcels could be created, further subdivision and development of these lots could not be afforded without greater degrees of roadway access.

With both considered, it was found that greater road access was needed to further the plan in a more efficient manner. Hence, an urban street grid complete with streetscape was constructed with equal development density and with multi-story garage structures. Rather than eliminating the spine road, a new urban street is proposed through the originally designed Greensward. While still maintaining some degree of the Greensward's qualities, this created abundant street frontage to a greater number of development parcels and will provide greater flexibility and access to the entire development.

Service retail uses originally contemplated adjacent to proposed garage structures were to be encouraged but be integrated into future buildings where the market supported such locations. Existing open spaces were to be retained, but the earlier planned Greensward was replaced.

The 2015 changes include changes to the guidelines to address proposed development related to both the Indigo Hotel and The Mill @ Second Avenue Housing proposed by Walnut Capital. This includes an updated illustrative site plan and current program, updates to exhibits related to ownership (A-6), Site Section(B-5 & 6) for changes along Second Avenue and Urban Blvd, Parking and Services (B-17), Building Use Guidelines (C-2), Build To, Building Materials (C-5), Building Wide (C-6)Guidelines to address changes for the hotel and housing and to strengthen areas earlier unaddressed .This update's graphics reflect the current illustrative site plan and the appropriate text changes.

The 2020 changes address guidelines related to the proposed 925 Technology Drive Parking Structure. The structure is designed to provide space for all current and future parking needs within the Technology Center. The modifications to the PLDP guidelines permit this to happen within one structure. The update includes all revised site plans, graphics, and text (C-7) to reflect the proposed changes.



Project History/Proposed Changes



Planning and Development Principles

Intent

The intent of this document is to establish Design Guidelines for the implementation of additional development at the Pittsburgh Technology Center. The goal is to establish a framework of planning and building design principles that not only reinforce the existing integrity of the built environment, but also continue to encourage initiatives that will secure the Center as a nationally recognized, premier regional research and development center well into the next generation.

Use of Guidelines

These guidelines should be seen as a supplement to other existing, adopted legislation pertaining to the district, including but not exclusive to the Pittsburgh Urban Zoning Code.

Objectives

The primary objective of this development is to meet one of the City's primary economic development goals, which is to encourage the growth of advanced technology industries by developing competitive sites within the City, in addition to providing valuable jobs for Pittsburgh area residents.

As fashioned, PTC will provide a planned employment center for research, prototype development and other uses related to research and development subject to the design guidelines and the masterplan included in this PLDP.

The project is a major component of the region's strategy of redevelopment efforts in the Monongahela River Valley, and of the development strategies of the City of Pittsburgh, Allegheny County Carnegie Mellon University, and the University of Pittsburgh.

The purpose of this PLDP is to describe carefully the planned and highly desirable environment that will be created at the Pittsburgh Technology Center to accomplish these objectives.

The development of the PTC is intended to:
Expand the district while complimenting the built fabric of the existing project.

Create a mixed use component offering project related retail and restaurant space, potential sites for residential uses as the market dictates while affording a natural expansion of research and development space.

Create flexible zoning to allow for unique economic development expansion related to the institutions.

Create a project that provides a strong connection to the South Oakland and Downtown while planning for the eventual transformation of the riverfront into a unique expansion of the City's rivertrail system and related open spaces.

Improve the pedestrian qualities of the project by incorporating existing open spaces, while improving their quality and integrity.

Planning and Development Principles

Higher Density and Structured Parking

Promote a higher degree of structured parking to support the anticipated density, but in a way that is more integral and central to the development that encourages a stronger pedestrian oriented center.

Amenity Driven Open Space

Provide an amenity driven plan that parallels other urban waterfront projects in the City and that focuses resources to capitalize on the River as its market in the regional marketplace.

Broaden Visual and Physical Access and Interconnections

Add to and expand the existing public spaces improving the linkage and connectivity to the river and other future projects.

Add a new urban street that affords greater frontage and access while still incorporating many of the same functional qualities of the Greensward.

Provide Public Spaces

Develop public spaces that are more usable throughout, that provide a stronger visual and physical connection between buildings, and provide greater animation along their breadth by incorporating a greater degree of mixed uses.

Sustainability

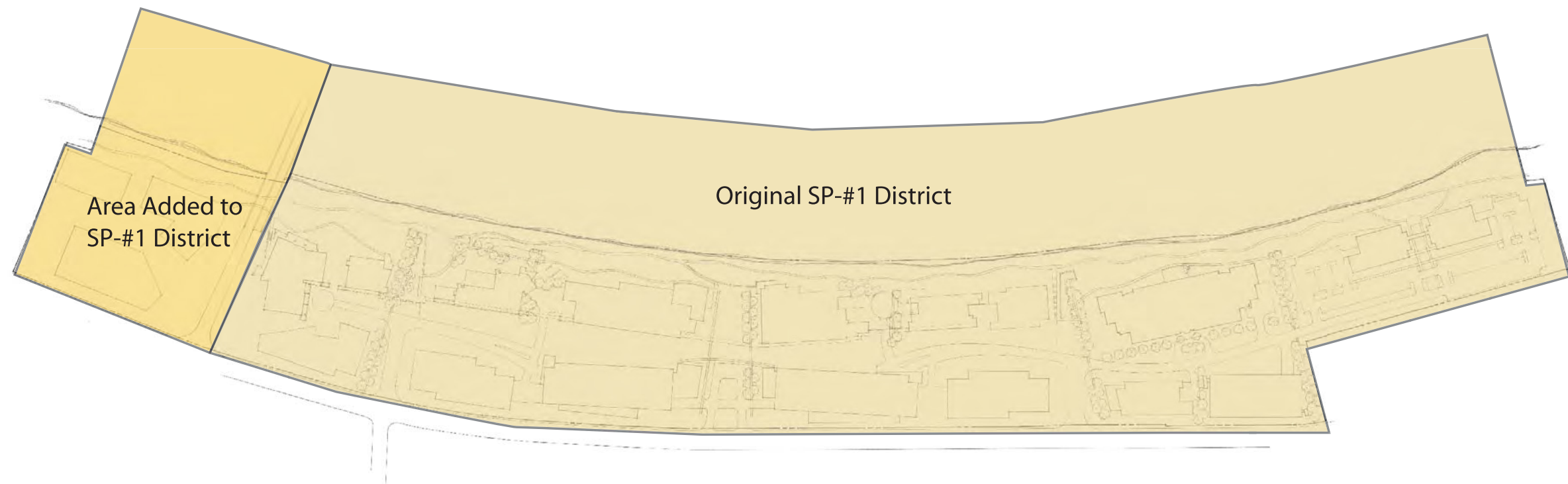
Sustainable practices will be encouraged in the redevelopment of new buildings and garages, open spaces, and infrastructure. These shall include methods that minimize and filter pollutants of stormwater runoff, the use of indigenous plant materials in ways that minimize water and energy consumption, the use of non toxic, recycled and local materials; the recycling of existing demolition materials such as roadway pavement for base material, encourage the use of higher occupancy vehicles such as intra site shuttles and other innovative means, the incorporation of amenities for cyclists; and the design of spaces that encourage human interaction and a good quality of life.

Final Land Development Plans (FLDP)

Prior to the commencement of any structures, the Developer shall submit an application for FLDP Approval in accordance with the Zoning Code. The FLDP shall be consistent with the approved Preliminary Land Development Plan and shall comply with all applicable provisions of the Zoning Code except the provisions that are specifically modified by the SP-1 Zoning provisions.

Planning and Development Principles





Existing Zoning and Amendment Summary

The existing zoning for the property was enabled as the first SP District in the City. The new changes will simplify the procedures and controls related to its development and will include additional acreage east of the Hot Metal Bridge.

The new District will eliminate the original four sub-districts which were regulated individually. Uses have been expanded to allow a more mixed use framework of hotel, retail, restaurant and residential uses. It will also allow additional floor area increasing it from .75 to 3.0.

Parking requirements have been eliminated in favor of a traffic and parking demand study that shall be reviewed and approved by the Zoning Administrator.

Building heights earlier varied from zone to zone, but altogether were limited to 180'. Now buildings are restricted to 90', except in specified locations where heights of 125' and 180' are allowed. These will provide greater building massing that will accent and reinforce Second Avenue and the critical intersection of Hot Metal Street and Second Avenue leading to the South Side Works.

Proposed Zoning (Uses/Zoning/FAR)

909.01.F SP-1 Pittsburgh Technology Center

The provisions of this section apply to all land within the SP-1 district, which is generally bounded by: Second Avenue on the north; the Monongahela River on the south; the Birmingham Bridge on the west; and beyond the Monongahela Connecting Bridge on the east.

909.01.F.1 Use Regulations

In the SP-1 District, land and structures may be used, and structures may be erected, altered or enlarged for only the uses listed in this section:

- (a) Laboratory / Research Services, including, but not limited to, advanced methodologies and processes in biotechnology, modern biological technology, computer hardware and software, and artificial intelligence and accessory and support facilities related to these uses
- (b) Manufacturing and Assembly associated with the uses listed in Sec.

909.01.F.2(a), with the following standards

- (i) the design of these items results from the research and development activities of the research institutions and companies located on the site;
- ii) the assembly and manufacturing uses are such that no explosive materials or processes are involved, and
- (iii) the uses produce no smoke, odor, vibration, noise, heat, dust, glaring light or other hazard or noxious or objectionable attribute is noticeable from outside any building.
- (c) Office uses associated with the onsite financing, management and administration of any of the uses listed in Sec. 909.01.F. 1(a).
- (d) Office uses involved with or related to biotechnology, biologic research, computer software, or other uses as determined by the Planning Commission;

Zoning and Development Program



GENERAL GUIDELINES

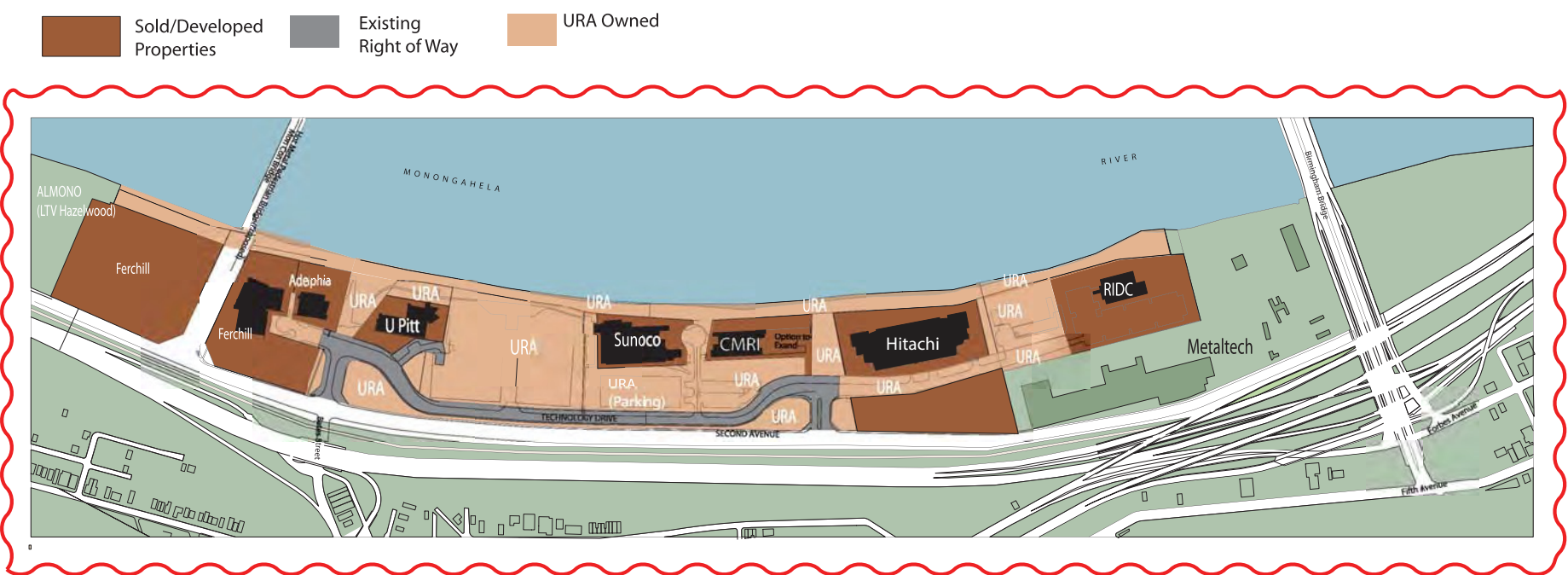
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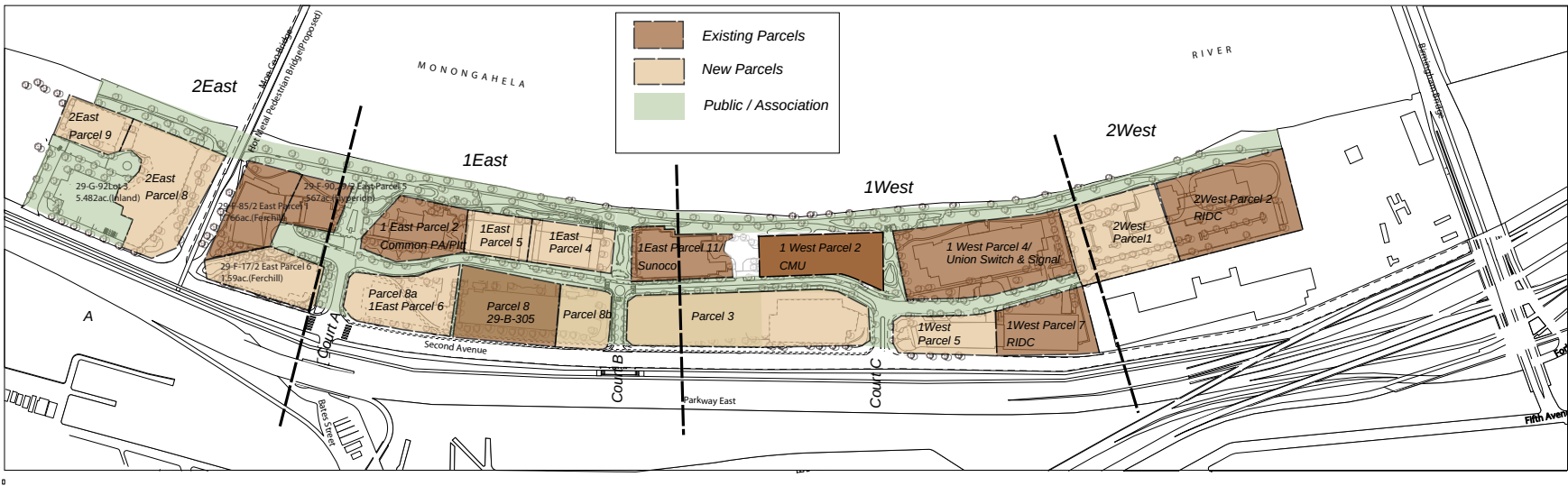
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Existing Ownership and ROW



Proposed New Ownership and ROW



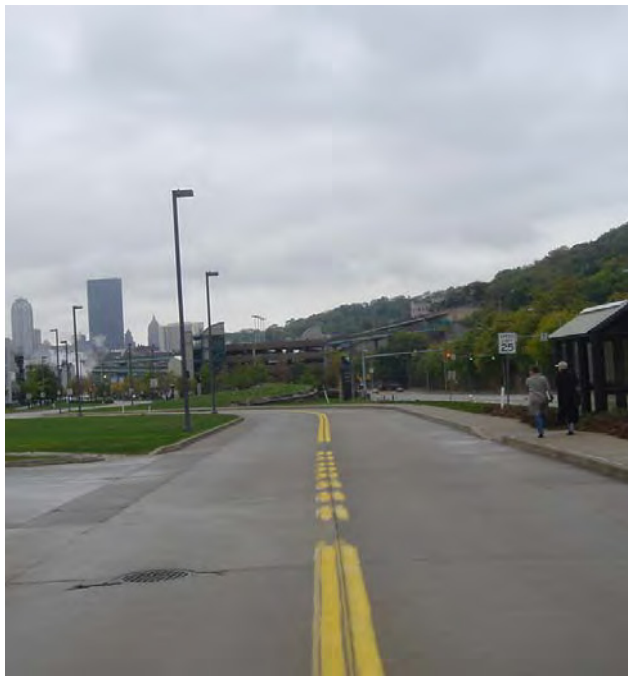
* Original PLDP Subdistricts

Ownership

s e c t i o n

B

Landscape Guidelines



The Character of the Site

The project site is approximately 52 acres located within the City limits of Pittsburgh, Pennsylvania. It sits adjacent to the Second Avenue corridor. The area has a suburban riverfront character. It is the home to several high-tech businesses and is occupied by local universities, as well. The site has easy access to Route 376 with a short commute to downtown Pittsburgh.

The site currently is accessible by two entrances on either end of Technology Drive. The eastern-most entrance is directly across from the Bates Street access into Oakland. The site has one parking garage used exclusively by Union Switch & Signal and several surface lots.

The Character of the Site

General Guidelines

The guidelines in this section illustrate key elements and design strategies for landscaping all areas in the Technology Center. Landscape plantings should compliment the architectural style of the buildings and respect how they address the Second Avenue Edge, the Urban Boulevard and the Riverfront. Landscapes of individual sites should be designed using simple forms and aesthetic combinations of plant material in rich, vertical layers. The use of native plants is highly recommended to anchor the building in its native context while reducing the need for excessive watering and maintenance.

This section begins with defining the general planting guidelines for the site, and then presents more specific requirements for each area. The section will end with defining the diverse plant palette for trees, shrubs, ground covers, and flowers. The use of pesticides is strongly discouraged anywhere on site. Green grounds-keeping practices are encouraged.

Since the use of traditional irrigation systems is not recommended due to the high demands of energy and water consumption, a one-year maintenance period for all new plantings is encouraged.



Illustrative Master Plan

Open Space Plan

The site will developed as a series of park-like spaces in which the new buildings will be sited. Architecture is primary and parking, as a function, is secondary

The site will be divided into three specific zones: The Second Avenue Edge, the Urban Boulevard, and the Riverfront. An additional component will be the Hedgerows.

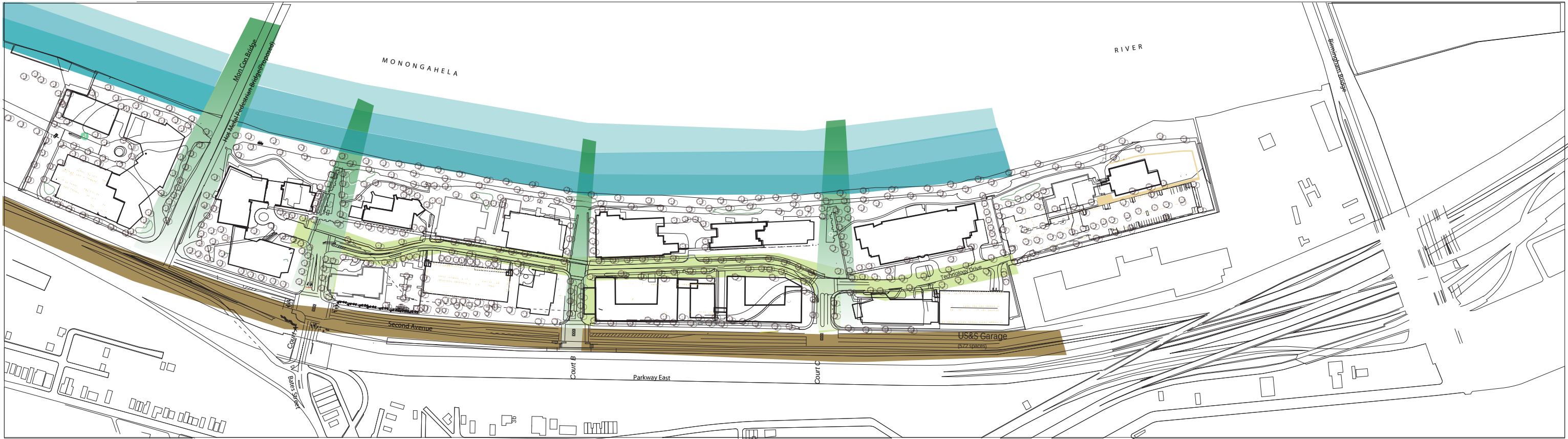
The Second Avenue Edge will have a unique character as being the crisp urban edge buffering the site.

The Urban Boulevard will be the pedestrian campus space that will help to separate the pedestrian from the vehicle. This space is envisioned as a linear park connecting the individual spaces throughout the site.

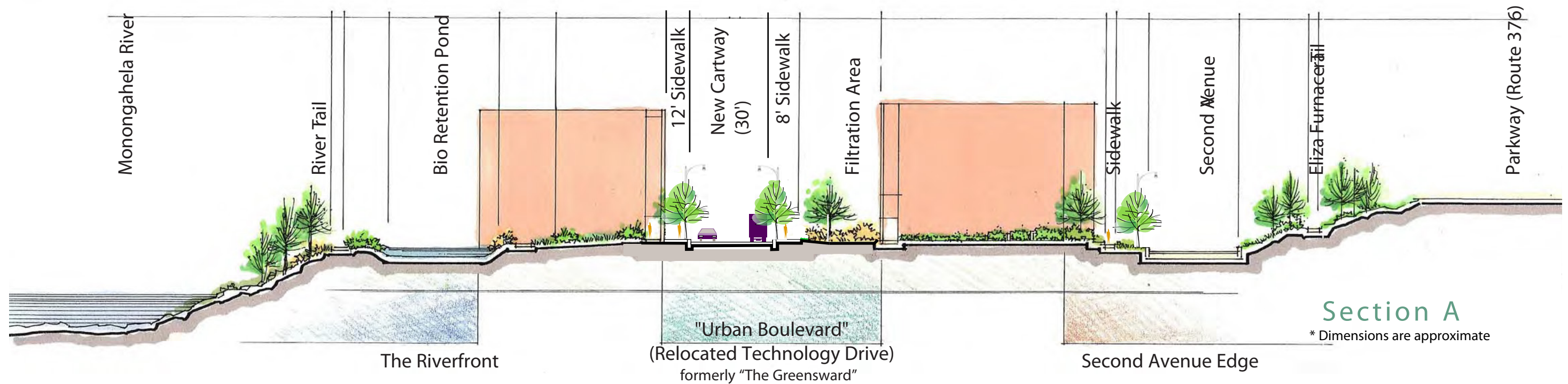
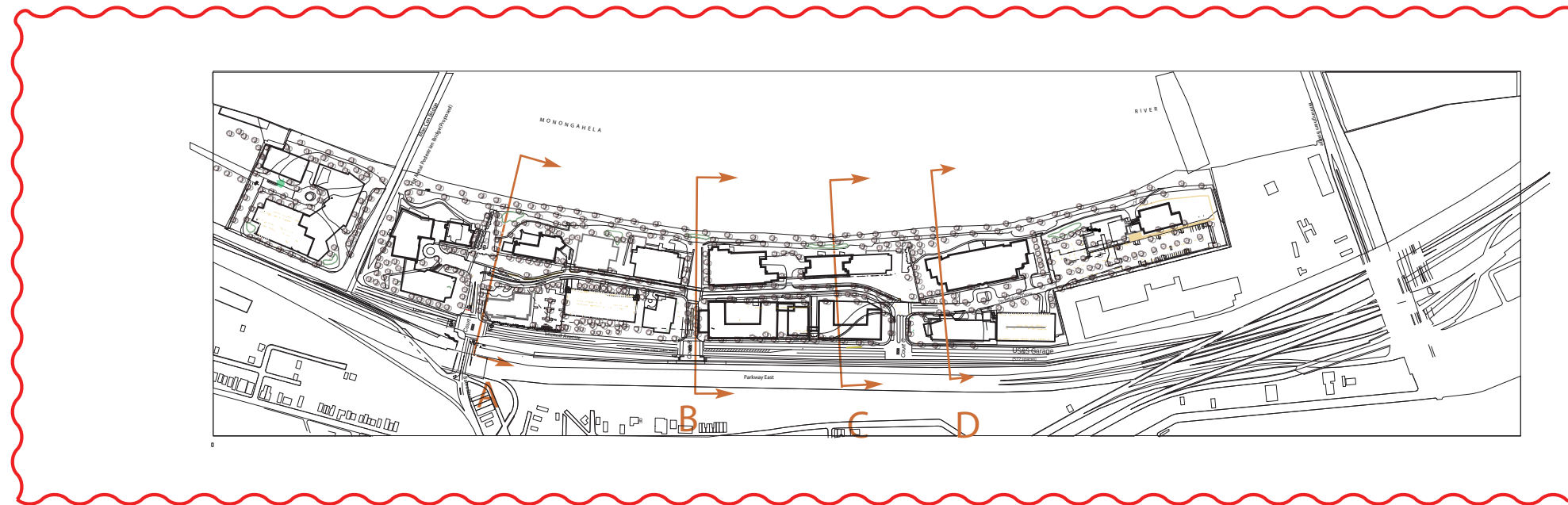
The Riverfront will continue to provide a natural edge for the site along the river Future development of this area will preserve that naturalness and provide additional indigenous plantings.

The Hedgerows will tie all of this together in well designed overlooks to the river These areas are envisioned as the public gathering spaces and areas where individuals can pass the time in an outdoor environment.

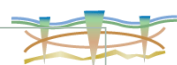
- Second Avenue Edge
- The Urban Boulevard
- The Riverfront
- The Hedgerows



Open Space Plan



Site Sections



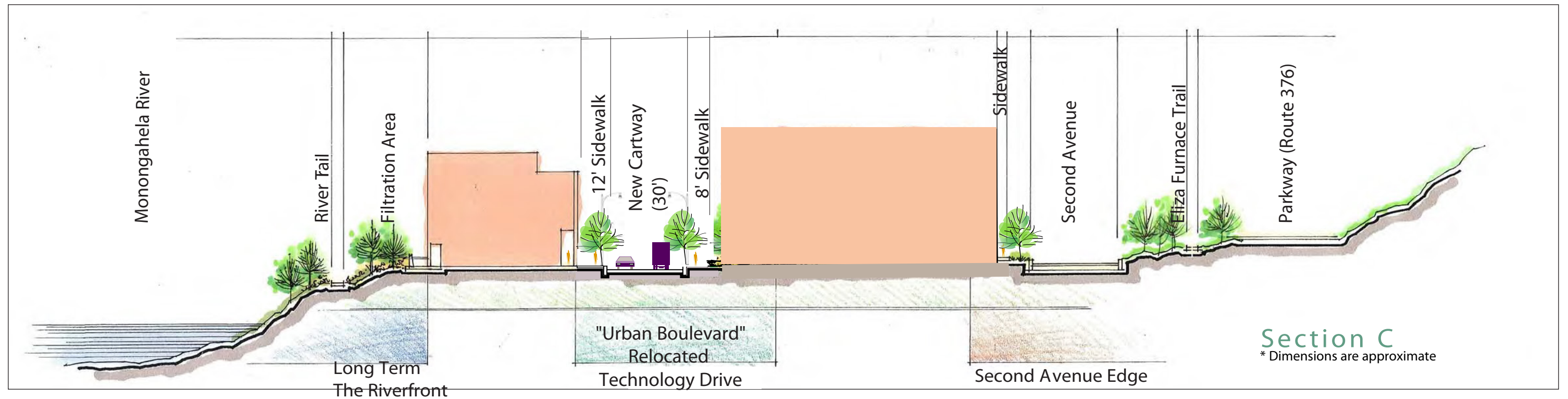
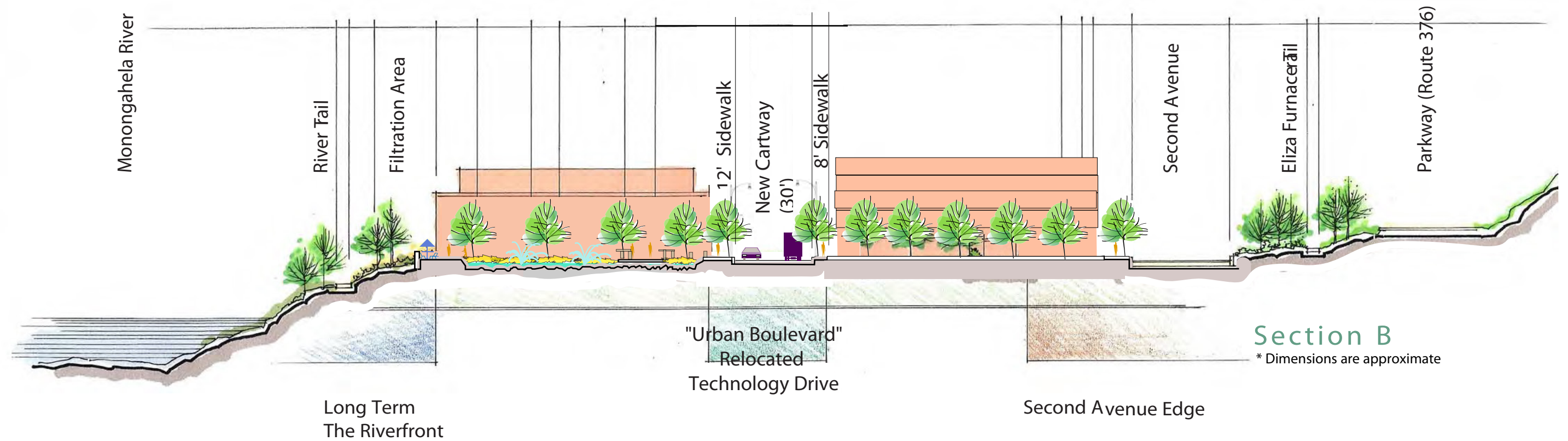
LANDSCAPE GUIDELINES

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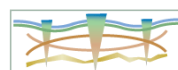
Pittsburgh Technology Center PLDP

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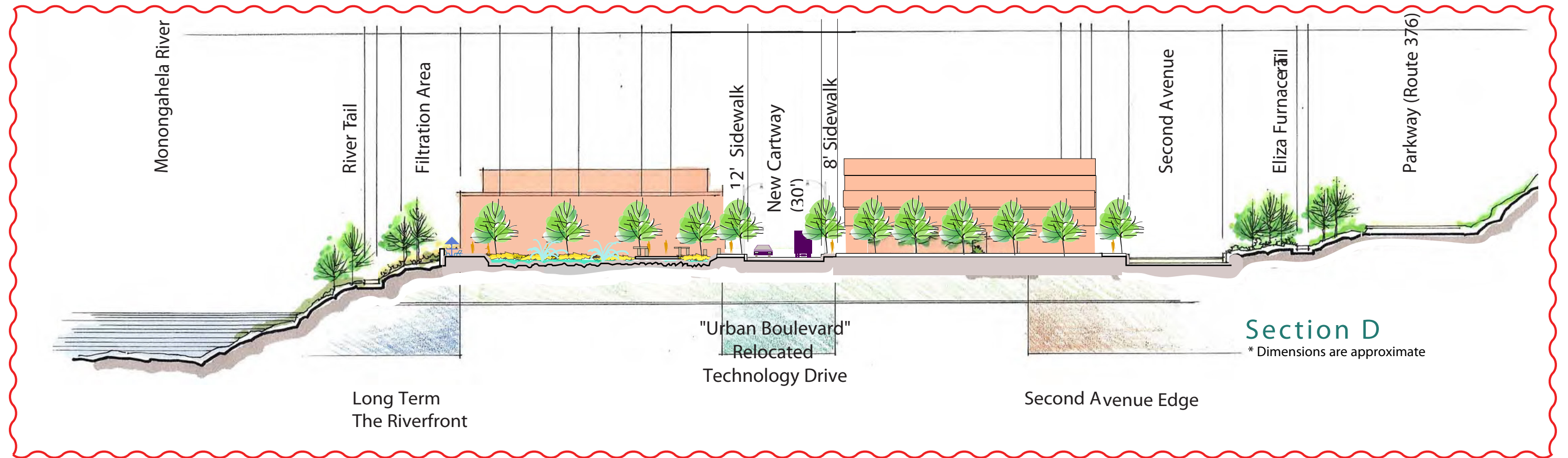


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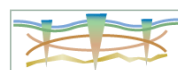


LANDSCAPE GUIDELINES

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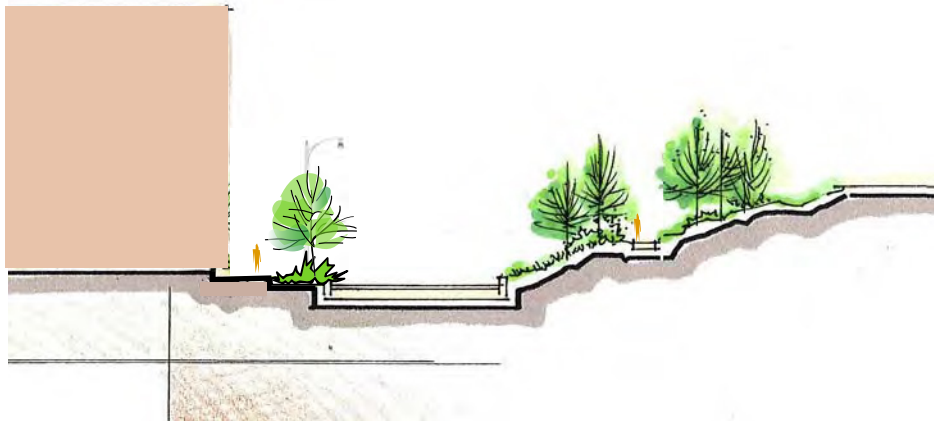
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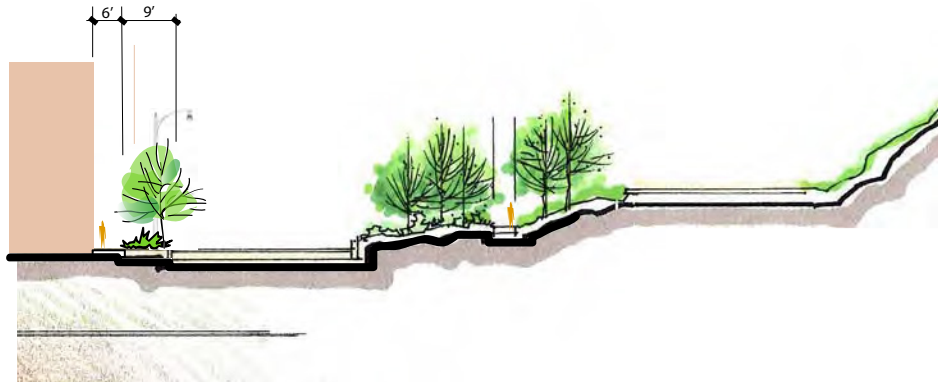
LANDSCAPE GUIDELINES

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Second Avenue Edge



Second Avenue Edge

Second Avenue, although posted at 35 mph, is a high-speed street providing a thoroughway to main connections into Oakland and across the Hot Metal Bridge into the South Side. The site has three main entrances are off of this road. The landscape adjacent to the site will be consistent with the architecture of the site by incorporating native grasses and plantings adjacent to a concrete walkway. Specifically located trees will provide screening for the service areas that overlook Second Avenue.

One-story first level retail will be provided for the convenience of the tenants of Pittsburgh Technology Center. This retail core will be located adjacent to the middle entrance into the site. On-street parking and metered parking located within the garages will be available for the use of the patrons. This area will be designed to provide a pedestrian-friendly environment by expanding the pavement into a plaza and providing moveable furniture to create a patio environment.

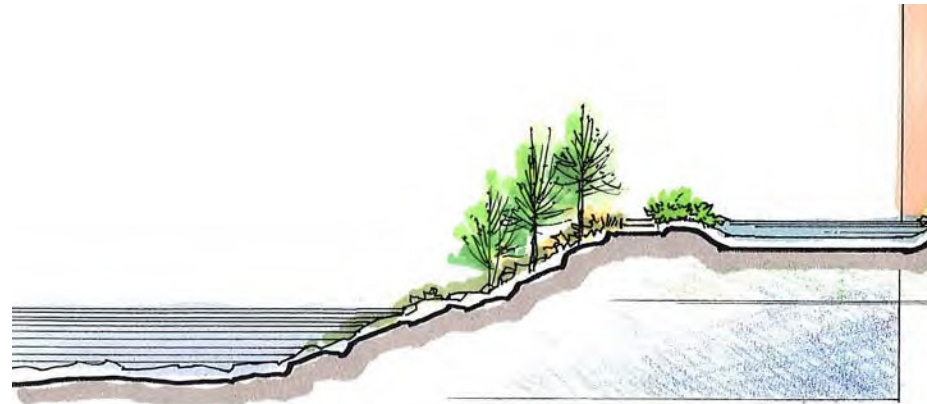
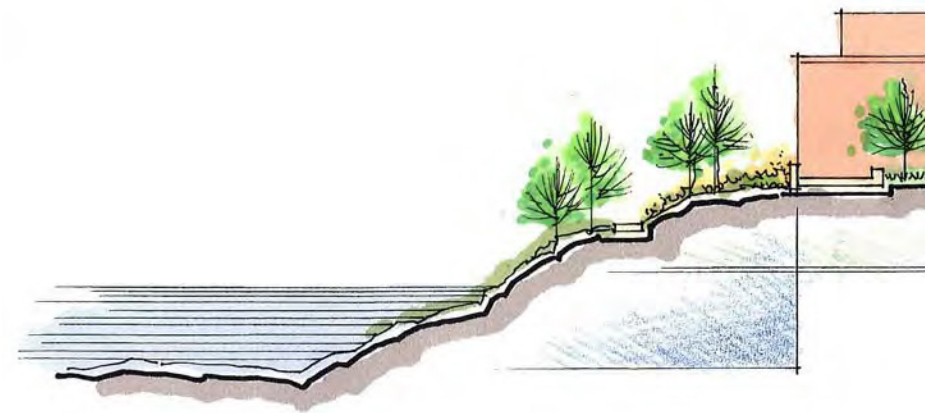


Urban Boulevard

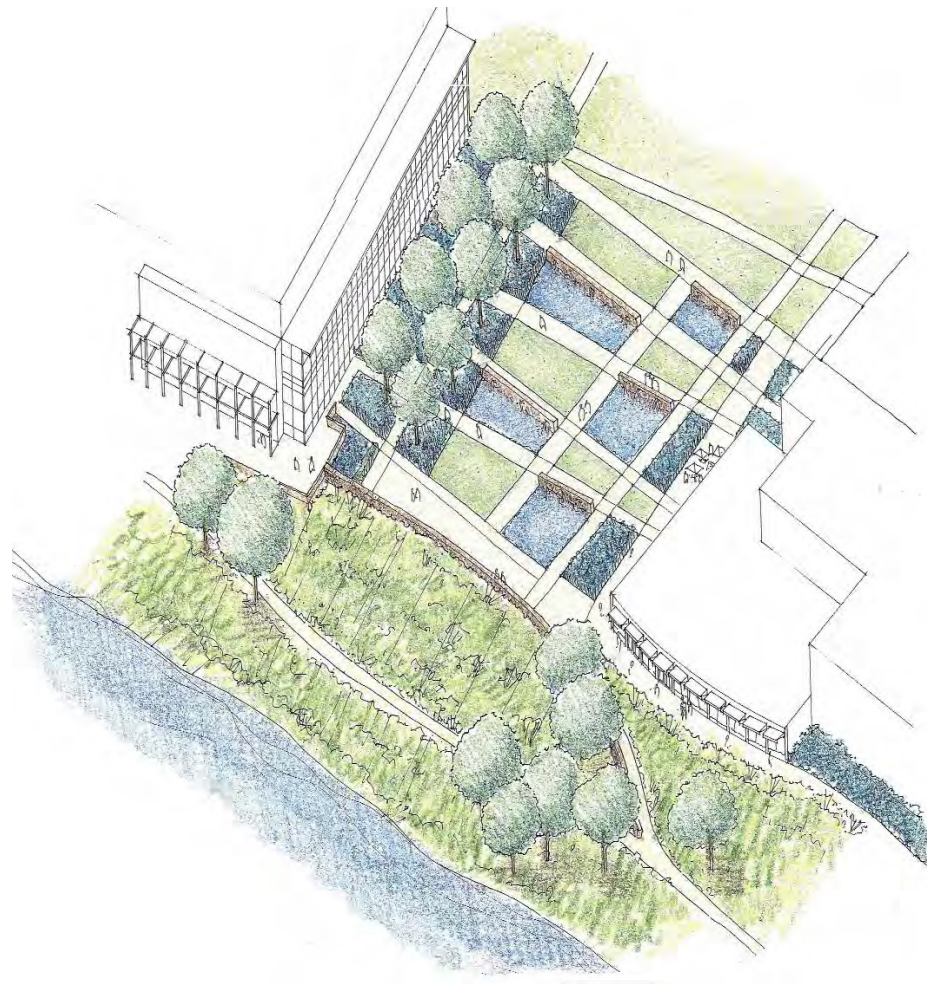
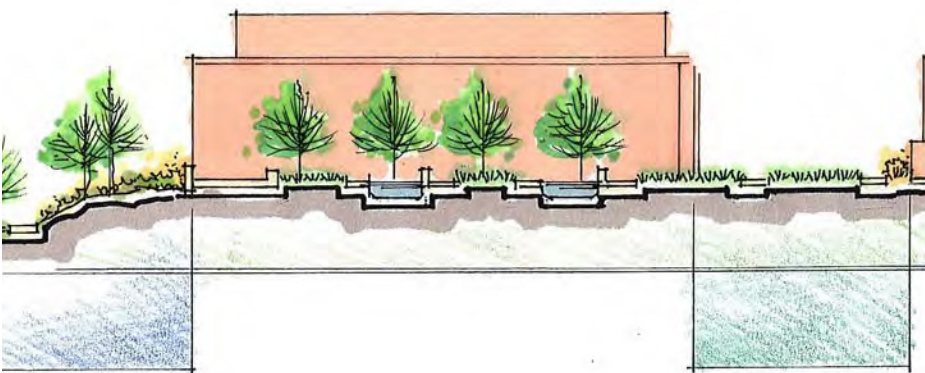
Urban Boulevard

A linear urban boulevard created along the spine between the buildings will be the main focus of the Technology Center. It will have parallel bands of natural plantings that will provide the cohesiveness for the setting of each of the individual buildings. Sustainable practices will be encouraged to minimize maintenance and provide a sensitive approach to the once natural setting. Overlooks will be created at specific intervals to allow a connection to the river. Where possible, actual connections to the river walk will be provided. The use of natural materials and the reuse of existing stones will be encouraged. On-street parking will be permitted only near the retail areas. The use of sweeps of ornamental grasses and native plantings will be encouraged.

Sections



Riverfront



Hedgerows

Sections

Riverfront

The existing vernacular landscape that can be found along The Riverfront will be continued along the site. Access from some of the new overlooks will enable the tenants of the Technology Center to enjoy the natural amenities. Supplemental planting will enhance to the existing natural vegetation. Some areas will be opened up to allow vistas along the river to downtown and across the way to the South Side Works.

The planting area along The Riverfront provides a unique opportunity to plant additional native, indigenous material. When the railroad is abandoned, the continuation of the rivertrail will help to tie the development to downtown. These types of plants help to stabilize the river bank and promote a healthy, natural environment.

Hedgerows

The Hedgerow Overlooks provide an opportunity to tie the development to the river. Each of these overlooks will be designed to accommodate a range of activities from reading a book on a bench to eating lunch at one of the moveable tables and chairs to gathering for a lecture or musical event.

These spaces will provide shade and a variety of plants from ornamental grasses and groundcovers to perennial colors. The paving will be chosen from a range of exposed aggregate concrete paving to natural stone pavers. Aesthetic lighting will be provided to enhance these areas and provide a safe environment.

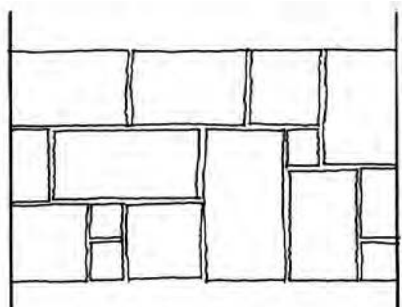
It is envisioned that these areas would be ideal for the inclusion of public art.



Paving

Concrete is the minimum standard for surface paving unless otherwise noted in the Pattern Book. Paving is an important element of any lot landscape. Entries may be greatly enhanced by the use of materials including aggregate concrete, brick, or stone. Lot owners can express their individual preferences in the private zone where the surfaces can be softer in appearance. Materials such as stone, brick, concrete, gravel and other porous materials are encouraged.

The use of porous pavement will be utilized where feasible within the site. Crushed limestone walks located along the Riverfront and various porous paving materials will be used in various zones to aid in the reduction of run-off.



Tumbled Concrete paving random pattern



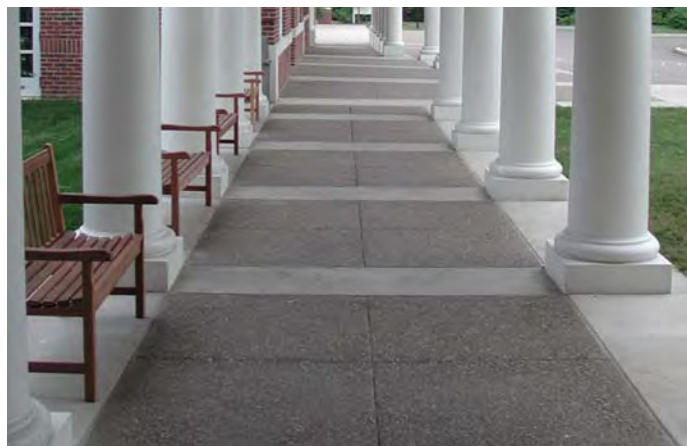
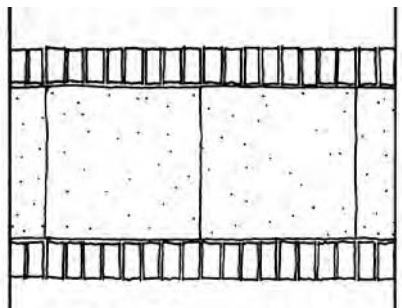
Scoring pattern



Cut stone paving



Crushed limestone paving with cut limestone edge



Exposed aggregate concrete paving



Exposed aggregate paving with Belgium block edge

Landscape Elements - Paving



LANDSCAPE GUIDELINES

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Imprinted Concrete Paving



Metal railing



Flush Paving Details



Artistic paving



Cut stone steps



LED lighting in pavement



Rolling topography



Mist encased rocks



Words-worthy paving

Materials & Public Art

The material palette to be used in site related elements should be compatible with the architecture. Materials such as aluminum and natural stone would be an appropriate choices. The images contained on this page show how these elements can be integrated into the site and with the architecture.

Another site element consideration is public art. There would be multiple opportunities throughout the site. The images contained on this page illustrate how public art can be integrated into site elements in lieu of stand-alone pieces.

Landscape Elements - Materials & Public Art



Metal Bench example



Metal Bench example



Metal Bench example



Litter Receptacle example



Moveable chairs and table



Litter Receptacle example



Metal/Wood Bench example

Site Furnishings

These images reflect the standard of site furnishing and elements that will give the development a rich, unified landscape vocabulary. The quality and durability of the landscape details and site furnishings are essential to providing the Technology Center with a unique sense of place. These elements compliment the architecture and blend with the landscape. Reuse materials wherever possible and the use of products with a high percentage of recycled material will be encouraged. All wood products shall be certified from sustainable forests.

There will be varied combinations of park and open space plantings throughout the development including shade trees, ornamental trees, shrubs, meadow, and ornamental garden plantings. In addition, each park and public open space component will have a native plant palette to compliment the site and water edge plantings to ensure diversity and species distribution.

Several areas will be designated as gathering spaces and will have opportunities for seating and gathering. These areas will have concentrated areas of planting and shade trees.



Metal Signge example



Metal Signge example

Landscape Elements - Site Furnishings



Open-air Pavilion/Bus Shelter with Seating example



Bike Rack example



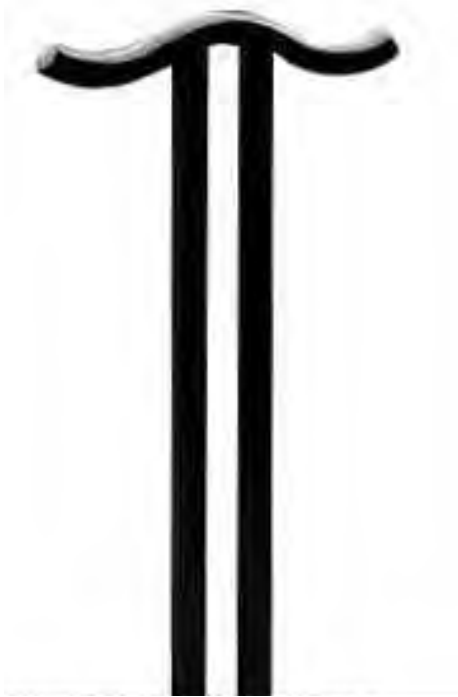
Bike Rack example

Transit Materials

A goal of the development is to promote alternative transit options. The site is strategically located along an existing bus line. The intent would be to provide additional stops along that line. Shelters designed to compliment the architecture would be appropriate.

By providing adequate bike storage within the proposed parking garages, cycling commuters can take advantage of the close proximity to the Eliza Furnace Trail, thus reducing the number of single-occupant cars. Bike racks should also be located throughout the development.

With the construction of the Hot Metal Pedestrian Bridge, a connected, well integrated trail system will be available to all tenants and visitors to Pittsburgh Technology Center.



Bike Rack example



Open-air Pavilion/Bus Shelter with Seating example

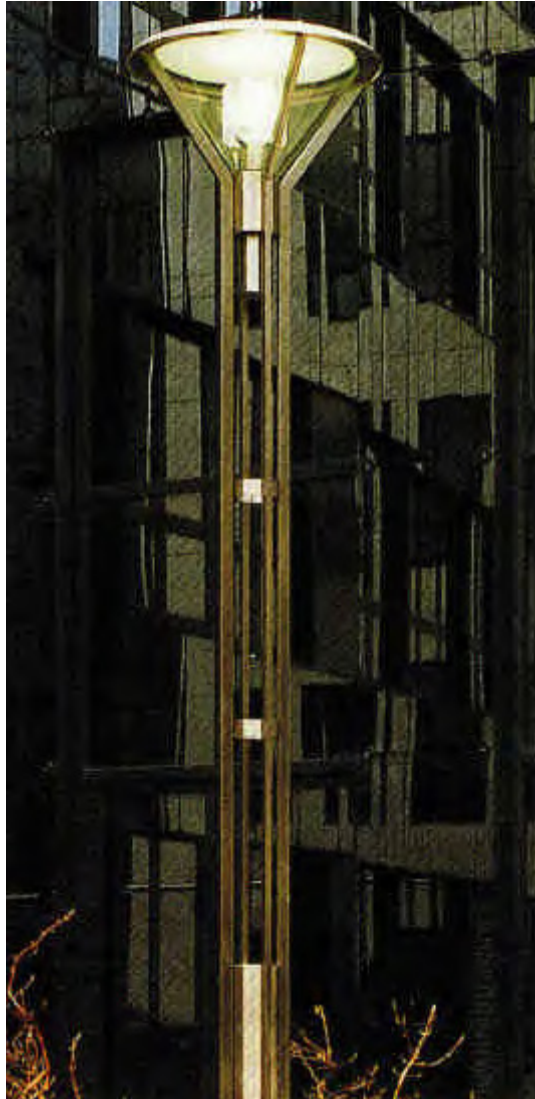


Bike Rack/Light example



Bike Rack example

Landscape Elements-Transit Materials



Lighting Elements

The primary goal of the site lighting is safety. The style should compliment the architecture of the site. Black paint, brushed aluminum or other metallic finish would be appropriate choices. A variety of types of lighting is necessary. The roadway lights should be mounted on poles at least 25' high. Pedestrian scale lighting should be mounted between 10' and 15' and bollards should be appropriately spaces to provide even light along the walkway. Professional photometrics should be calculated to provide an balanced lighting plan. A metal halide light source will provide the proper ambiance and energy efficient lights should be considered at all times. Dark Sky Technology should be utilized whenever possible.



Landscape Elements - Lighting



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Pittsburgh Technology Center PLDP B 12

Plant Palette



Second Avenue Edge

Trees

- Celebration Maple
- Paperbark Maple
- Katsura-Tree
- Carolina Silverbell
- White Fringetree
- Honey Locust
- Foster Holly
- Red Oak
- Regent Scholartree
- Delaware Elm

Ornamental Trees

- Tradition Serviceberry
- Eastern Redbud
- Yellowwood
- Kousa Dogwood
- Sugar Tyme Crab
- Bald Cypress

Shrubs

- Red Osier Dogwood
- Holly Varieties
- Northern Bayberry
- Mugho Pine
- Viburnum Varieties

Ornamental Grasses

- Red Switch Grass
- Fountain Grass
- Dwarf Fountain Grass



Groundcovers

- Purpleleaf Wintercreeper
- Big Blue Lily Turf
- Pachysandra
- Blue Myrtle

Perennials

- Astible
- Snow Cap Shasta Daisy
- Lilac Cranesbill
- Blood-red Cranesbill
- Apple Tart Daylily
- Stella D'Oro Daylily
- False Dragonhead
- Black Eyed Susan



The Greensward

Shade Trees

- Red Maple
- Swamp Maple

Small Trees

- Serviceberry
- River Birch
- Black Tupelo

Shrubs

- Red Chokeberry
- Sweet Pepperbush
- Northern Bayberry
- Winterberry
- American Cranberrybush
- Silky Dogwood
- Gray Dogwood
- Red Twig Dogwood

Grasses

- Switch Grass

Herbaceous Plants

- New York Aster
- Joe Pye Weed
- Sweet Ox-Eye

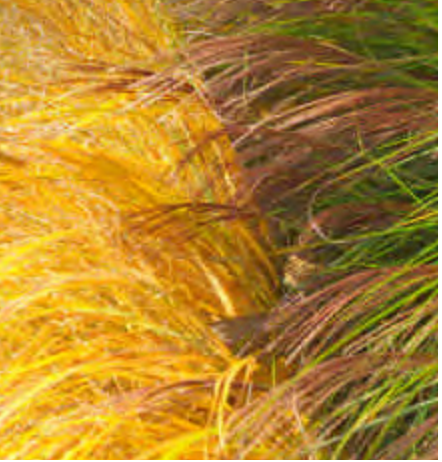


Herbaceous Plants (cont.)

- Blue Flag Iris
- Cardinal Flower
- Sweet Black-Eyed Susan
- Fireworks Goldenrod
- Blue Vervain
- New York Ironweek

Groundcovers

- Allegheny Pachysandra
- Purpleleaf Wintercreeper
- Blue Myrtle



Landscape Elements - Plant Palette Second Avenue Edge&The Greensward



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Plant Palette



The Riverfront

- Trees**
- Swamp White Oak
 - Pin Oak
 - Katsura-Tree
 - Bald Cypress
 - London Plane Tree
- Ornamental Trees**
- Fringe Tree
 - Umbrella Magnolia
 - Pussy Willow
- Large Shrubs**
- Winterberry
 - Spicebush
 - Highbush Blueberry
 - American Cranberry-bush
 - Red Chokeberry
 - Buttonbush
 - Silky Dogwood
- Small Shrubs**
- Northern Bayberry
 - Pinxterbloom Azalea
 - Swamp Azalea
 - Fragrant Sumac



- Small Shrubs (cont.)**
- Swamp Rose
 - Purpleosier Dogwood
 - Dwarf Sweetspire
 - Red Osier Dogwood
 - Yellow-twig Dogwood
 - Virginia Sweetspire
 - Downy Leucothoe
- Perennials & Grasses**
- Pink Rose Mallow
 - White Rose Mallow
 - Common Daffodil
 - Ribbon Grass
 - Fountain Grass
 - Dwarf Fountain Grass
 - Switch Grass
 - Big Bluestern
 - Hardy New York Aster
 - Feather Reed Grass
 - Turtlehead
 - Tufted Hairgrass
 - Joe Pye Weed
 - Hardy English Ivy
 - Sneezeweed

The Hedgerows

- Trees**
- Celebration Maple
 - Paperbark Maple
 - Katsura-Tree
 - Carolina Silverbell
 - White Fringetree
 - Honey Locust
 - Foster Holly
 - Red Oak
 - Regent Scholartree
 - Delaware Elm
- Ornamental Trees**
- Tradition Serviceberry
 - Eastern Redbud
 - Yellowwood
 - Kousa Dogwood
 - American Holly
 - Crapemyrtle
 - Sweetbay Magnolia
 - Saucer Magnolia
 - Southern Magnolia
 - Sugar Tyme Crab
 - Bald Cypress
- Shrubs**
- Azalea Varieites
 - Boxwood Varieties
 - Summersweet
 - Bloodgood Siberian Dogwood
 - Red Osier Dogwood



- Shrubs (cont.)**
- Oakleaf Hydrangea
 - Holly Varieties
 - Ann Magnolia
 - Northern BayberryMugho Pine
 - Rhododendron Varieties
 - Rose Varieties
 - Spirea Varieties
 - Fantasy French Lilac
 - Yew Varieties
 - Viburnum Varieties
- Ornamental Grasses**
- Red Switch Grass
 - Fountain Grass
 - Dwarf Fountain Grass
- Groundcovers**
- Purpleleaf Wintercreeper
 - Big Blue Lily Turf
 - Pachysandra
 - Blue Myrtle
- Perennials**
- Astible
 - Snow Cap Shasta Daisy
 - Lilac Cranesbill
 - Blood-red Cranesbill
 - Apple Tart Daylily
 - Stella D'Oro Daylily
 - False Dragonhead
 - Black Eyed Susan



Landscape Elements - Plant Palette

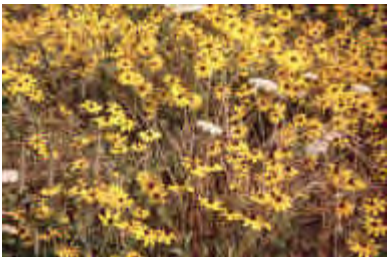
The Riverfront & The Hedgerows

Sustainable Practices

Environmentally sensitive design is based in understanding of natural systems and how they relate to the built environment. Preservation of precious natural amenities are critical and integrating sound environmental design practices can compliment and enhance these natural systems. The integration of sustainable and ecologically sound principles include: the protection of our water supply, maintaining biodiversity, and conserving materials and energy. A strategy for sustainable design includes:

- Integrated stormwater management and rain gardens
- Use of porous paving and recycled site materials
- Use of indigenous and drought tolerant plant materials to reduce
- Preservation of existing landscape materials wherever possible.

See Plant Palette for a listing of drought tolerant and sustainable plants.



Regional examples from the National Wildflower Center in Austin showing stormwater collection techniques, garden design using native vegetation, and a water harvesting system to recycle water for irrigation.



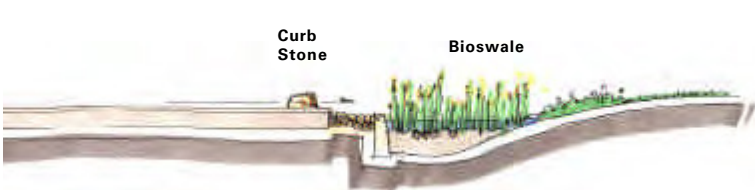
Typical parking lot incorporating ecological techniques including: bio-swales, porous paving and native plant materials resulting in a more natural garden setting.



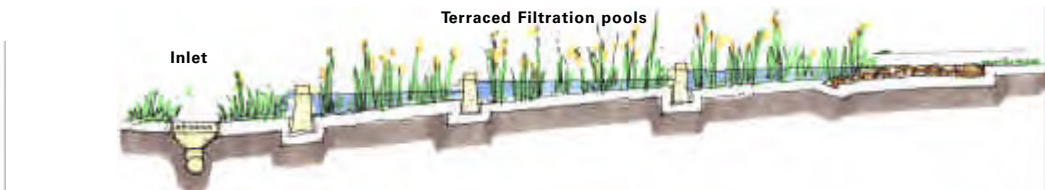
Example of bioswale



Stormwater catchment in a decorative garden setting



Section through bioswale at paving



Longitudinal section of terraced



Pebble paving



Crushed limestone paving



Porous pavers

Landscape Elements - Sustainable Practices



Vegetation Filtration Zone

The areas directly south of each of the buildings will be considered the Vegetation Filtration Zone. The function of these areas is to quickly collect run-off and through bio-remediation and retention, slowly filter the rain water to eliminate harmful pollutants.



Bioswales



Bioswales and Filtration Pools



Landscape Elements - Vegetation Filtration Zone



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Parking & Services

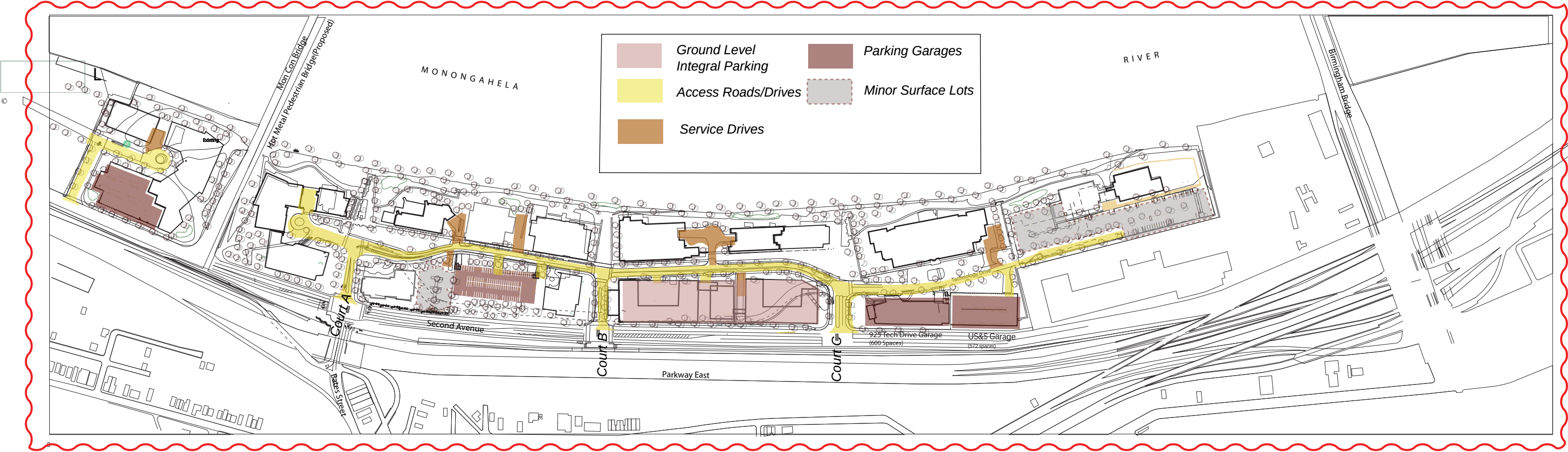
The site will be accessed off of Second Avenue at its two existing entrances. Slight alterations are being considered for each. The Bates Street entrance will be narrowed and the Technology Drive entrance will be shifted slightly. A third entrance will be added mid-site to access the new parking garages and provide some on-street parking for the proposed retail. The only alteration to Second Avenue will be the addition of a traffic-light mid-site at the new retail entrance.

The existing Technology Drive will be demolished and reconstructed as a internal urban street extending throught the middle of the site from Court A to Court B.This road will establish for additional frontage and flexibility for further subdivision hile affording appropriate access and service. As well, the new street will provide more flexibility for access into the parking structures and also to allow transiit a route that can more directly serve individual building sites

Service for individual buildidngs will be located between buildings in service courts that are landscaped and screened from the internal and surrounding streets and adjacent walkways.Short term deliveries will not be allowed except in the service courts.

Although the plan will incorporate traditional street tree planting along the Urban Boulevard, trees and landscaping along its length will be located in such a way as to establish a natural character and scale reinforcing the vegetative planting zones.

It is a goal of the development to encourage recycling and therefore there will be appropriate drop-off and pick-up locations within each service bay.



Parking & Services Plan

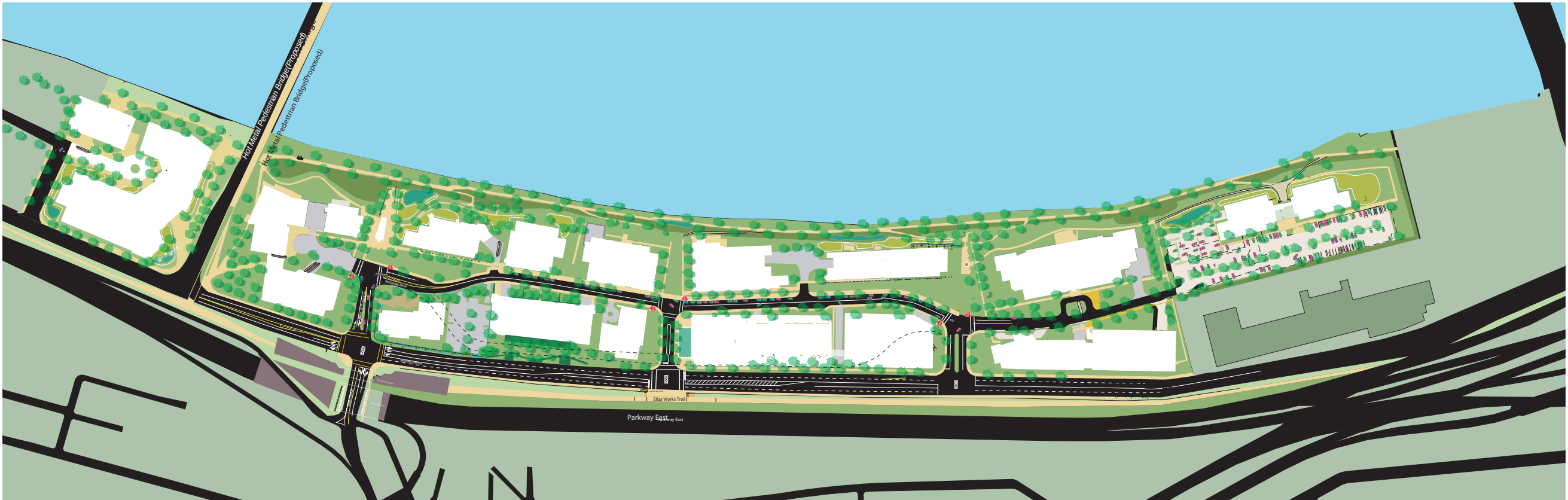


Parks & Open Spaces

The master plan includes passive recreational amenities and open spaces that will contribute to both the desirability and fundtionality of the Technology Center. The intent of the park and public open space network is to provide a variety of spaces for tenant and community oriented recreation.

The plan equitably distributes the park areas throughout the development so that each tenant is within a short walk of a larger park area. The areas will vary in size to accommodate a number of different amenities. They will also vary in character to pro mote distinctive place-making. The park areas are designed to provide a diverse set of passive recreational opportunities including walking paths, sitting areas, and gather ing spaces.

The parks areas will be an interconnected network of sidewalks and pathways, encouraging tenants to walk.



Parks & Open Spaces Plan



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Pittsburgh Technology Center PL

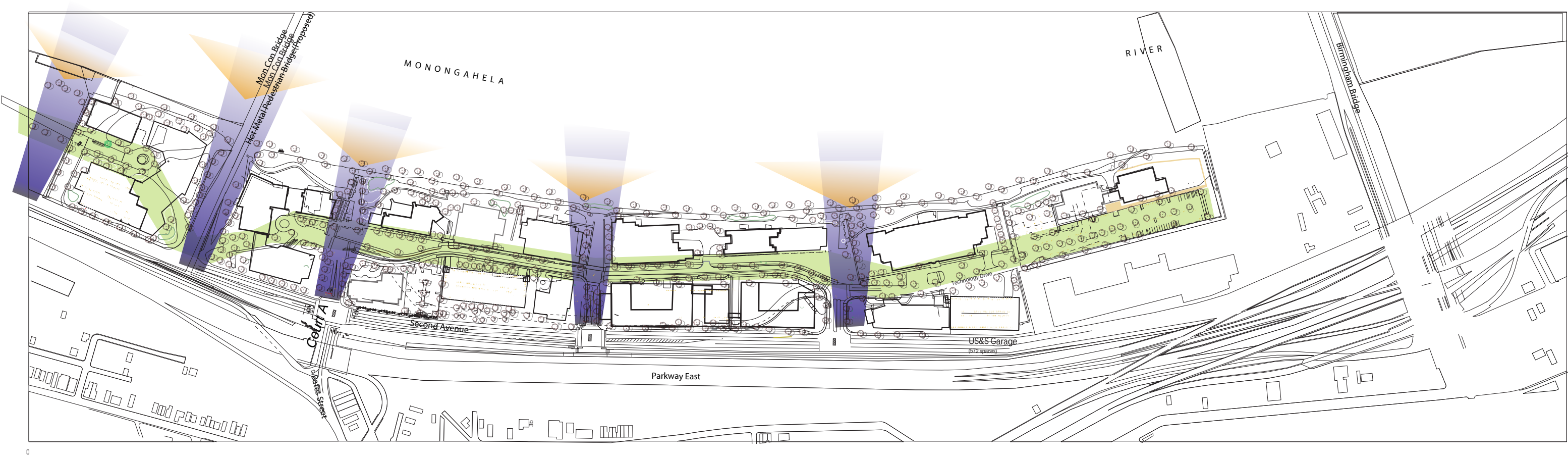
View Corridors

The site has significant views from all directions:

- South across the river towards South Side Works West down the river towards the City,
- East up the river towards Homestead,
- North up the hillside towards Oakland.

The property is situated to take advantage of the dramatic views from any vantage point on the site. Several key overlook locations are strategically located at the end of the Hedgerows throughout the site and several provide direct access to the river front walk.

The disturbance of the new development site work will be minimized to preserve as many of the vistas as possible.



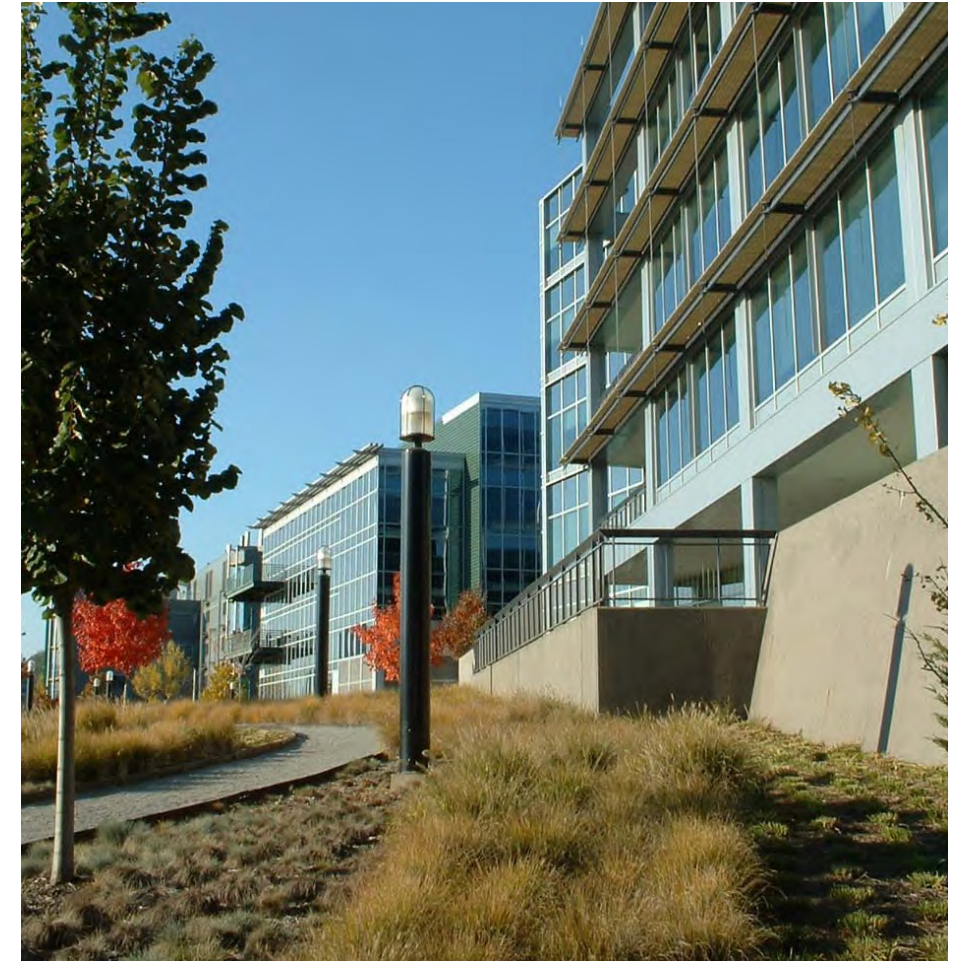
View Corridors



section

C

ARCHITECTURAL GUIDELINES



The original intent for the Pittsburgh Technology Center was to create an architecturally significant setting conveying the images of a modern employment center. The PTC was designed to be symbolic of its role in the City's evolution from an economy based on traditional industry to one based on research, innovation, and technology.

The site's location enables the complex to become a highly visible landmark. Its architectural form as seen from the Parkway, the Boulevard of the Allies, the river, and the Birmingham Bridge should create a uniform and strong images. Therefore, some of the plan's elements and design criteria call for large-scale forms, both in building mass and landscape form.

Overall building design and site planning were established to create a visual ambience which helps stimulate creative activity, and presents the choice of refreshing or contemplative surroundings, as a complement to the designed work environment. Therefore, within the large-scale forms, a wide range of scales and types of spaces should be create to provide a rich and varied environment.

These considerations led to the following urban design criteria for the site:

Building massing which is in scale with the Monongahela River valley and the complex's role as a landmark.

Architectural articulation of building massing which supports the creation of a variety of human-scaled open spaces.

Configuration and location of buildings which create a series of open spaces that acknowledge, articulate and relate to the riverfront and the river.

Building siting and roadway design which broaden the Second Avenue spatial corridor and enhance the principal view corridors described above.

A form for buildings and open space which fosters a sense of community and collegiality for all users of the complex.

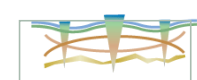
(the above was adapted from the original PLDP document for the Pittsburgh Technology Center)

These standards and considerations carry forward today as planning and design guidelines for the PTC evolve to meet new demands and use types.

Among the compelling assets of the Pittsburgh Technology Center is the exceptional quality of its architecture. Four of its buildings have been recognized with American Institute of Architects design awards. Three of these have been designed by an AIA-recognized Firm of the Year. Other buildings on the site have acknowledged the high standards of design and urban planning. It is the intention of these guidelines to continue high standards as an integral component of the Pittsburgh Technology Center identity.

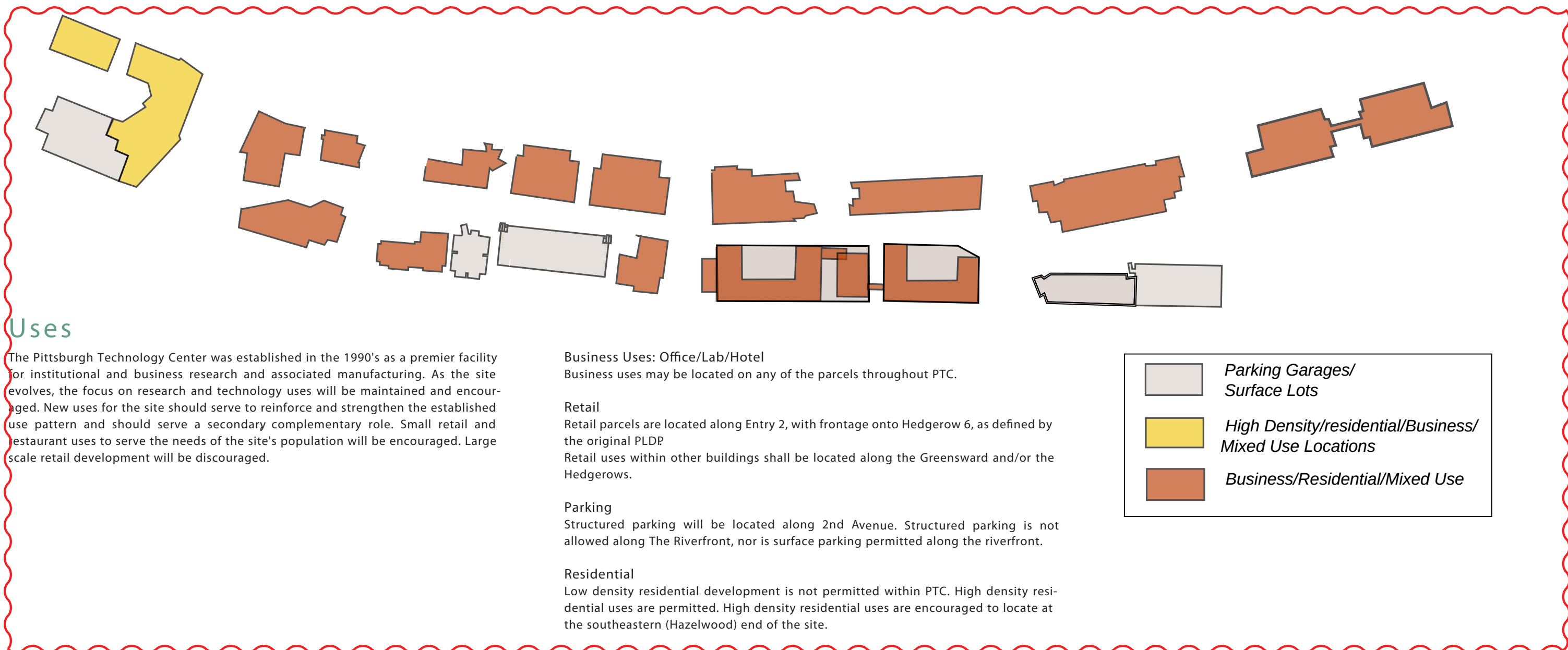
In addition, sustainable architectural design and urban planning are desired as hallmarks of Pittsburgh Technology Center and its principles of environmental stewardship, healthy work environments, efficient use of materials and energy are to be incorporated into all new buildings.

Introduction



ARCHITECTURAL GUIDELINES

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Uses

The Pittsburgh Technology Center was established in the 1990's as a premier facility for institutional and business research and associated manufacturing. As the site evolves, the focus on research and technology uses will be maintained and encouraged. New uses for the site should serve to reinforce and strengthen the established use pattern and should serve a secondary complementary role. Small retail and restaurant uses to serve the needs of the site's population will be encouraged. Large scale retail development will be discouraged.

Business Uses: Office/Lab/Hotel

Business uses may be located on any of the parcels throughout PTC.

Retail

Retail parcels are located along Entry 2, with frontage onto Hedgerow 6, as defined by the original PLDP. Retail uses within other buildings shall be located along the Greensward and/or the Hedgerows.

Parking

Structured parking will be located along 2nd Avenue. Structured parking is not allowed along The Riverfront, nor is surface parking permitted along the riverfront.

Residential

Low density residential development is not permitted within PTC. High density residential uses are permitted. High density residential uses are encouraged to locate at the southeastern (Hazelwood) end of the site.

	<i>Parking Garages/ Surface Lots</i>
	<i>High Density/residential/Business/ Mixed Use Locations</i>
	<i>Business/Residential/Mixed Use</i>

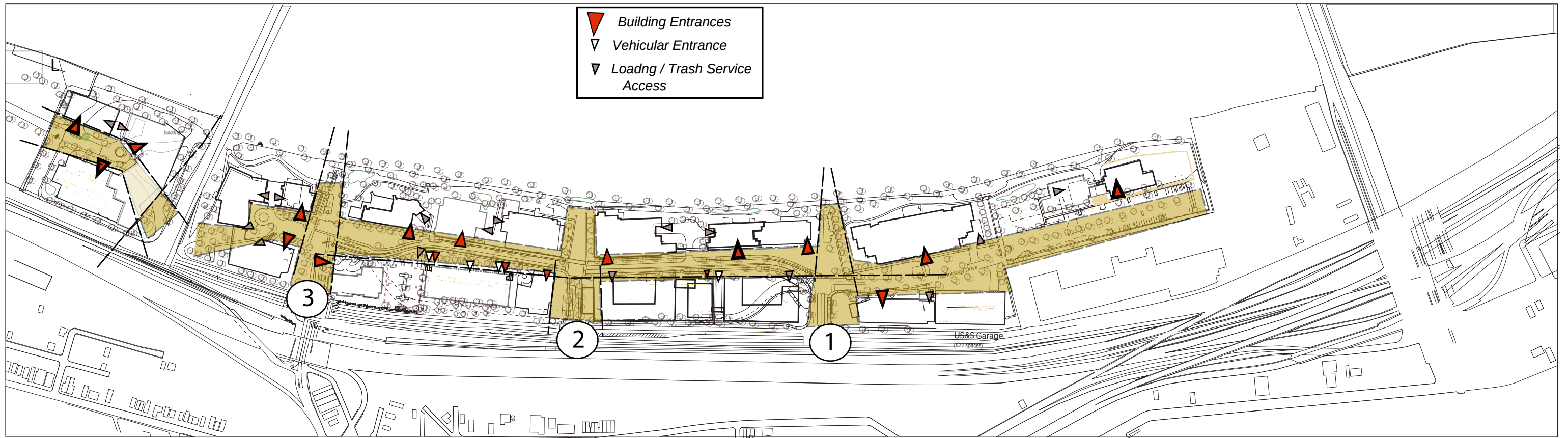
Building Use Guidelines



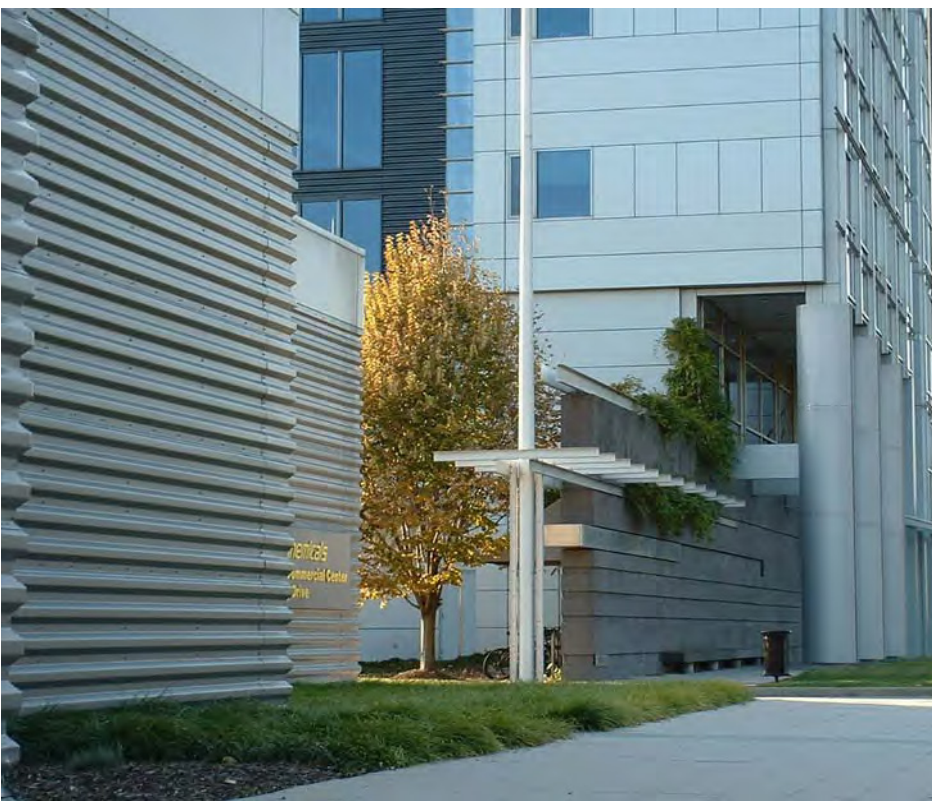
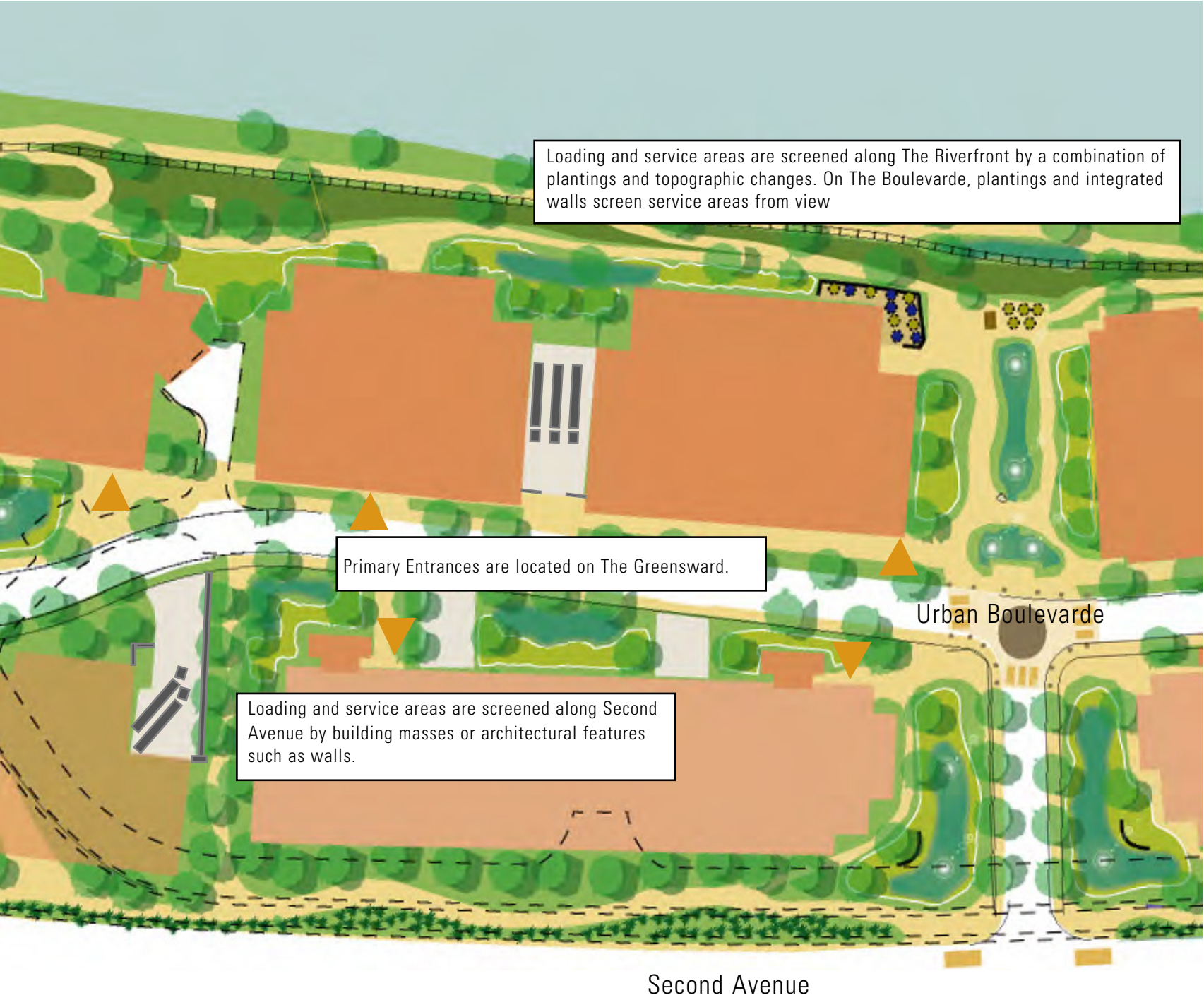
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Pittsburgh Technology Center PLDP C 2



Building Orientation

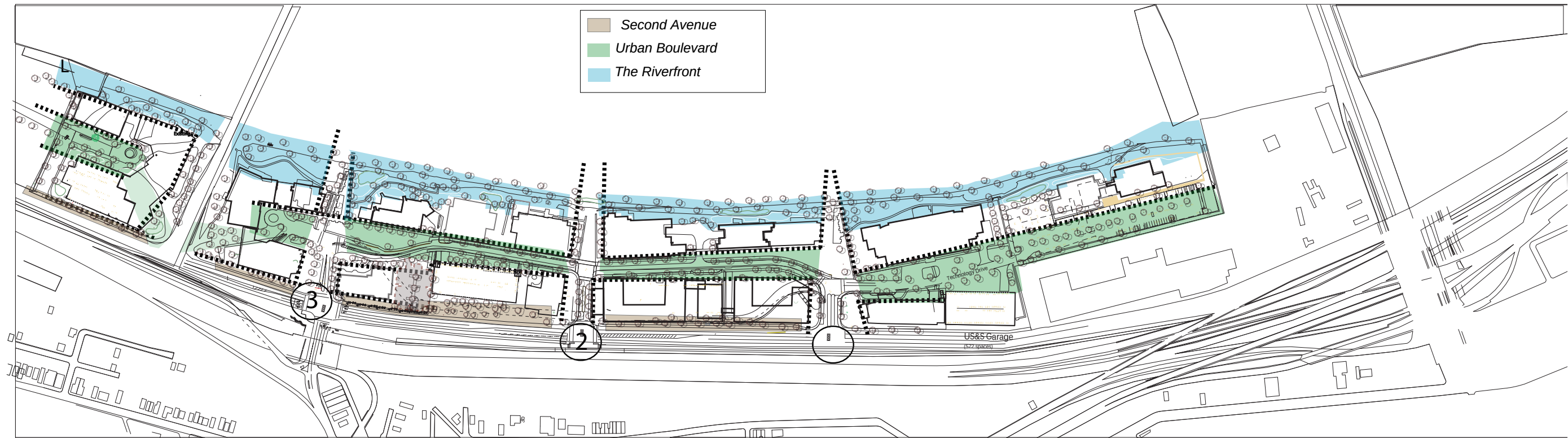


Existing loading & service areas along The Greensward are screened by architectural features that are integrated into the building design.



On The Riverfront, loading & service areas are screened by a combination of plantings and topographic changes.

Building Orientation (cont.)



Build-To

Existing buildings on the Pittsburgh Technology Center site are defined by a strong held Build-To line along the Boulevard, which clearly unifies structures across the site and defines the public space. New development will maintain and reinforce the Build-To line on both sides of the Boulevard. The intent of the original site planning was to have the buildings in each group give the impression of a single large complex similar in mass to the traditional complexes of our industrial river valleys. The new PLDP guidelines reaffirm this while allowing for additional flexibility across the site.

Build-To lines indicated on the plans define primary public spaces within the site and regulate its edges. They maintain the urban form, define urban spaces, and reinforce pedestrian movement. Along the Hedgerow zones, the Build-To lines reinforce view corridors to the river and provide spaces to site and watch the river. At Second Avenue Build-To lines define the setback of the buildings to the roadway.

Build-To Guidelines



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Pittsburgh Technology Center PLDP



The Sunoco and Carnegie Mellon Research Institute maintain a strong presence along the Boulevard's Build-To line.

Second Avenue

Buildings are required to maintain 75% of their facades to within 5' of the Second Avenue Build-To lines. The 5' distance may project out or in from theses Build-To lines. In addition, the plane of the building facades should remain within a five degree angle from the Build-To lines. Buildings may have varying heights, so long as the Build-To line is respected.

The Urban Boulevard

Buildings are required to maintain 75% of their facades along the Boulevard Build-To line. Buildings may have varying heights, so long as the Build-To line is respected.



The wall slicing through the Bridgeside Point building reflects the established Build-To line of The Greensward further down the site.



Arcades can be used to meet the Build-To line requirements, as illustrated by the CMRI building.

Hedgerows

Buildings are required to maintain 50% of their facades along the Build-To lines at the Hedgerows. The remaining 50% may set back a maximum of 10' from the Build-To line. Facades should remain parallel to the Build-To line. Buildings may have varying heights, so long as the Build-To line is respected.

The Riverfront

Along the river the building zones will be set back a minimum of 60 feet from the harbor line. Facades along the river are encouraged to create a variety of forms and set-backs, as illustrated by the examples of the existing Carnegie Mellon Research Institute, University of Pittsburgh BiotechnologySunoco, and Bridgeside Point buildings.



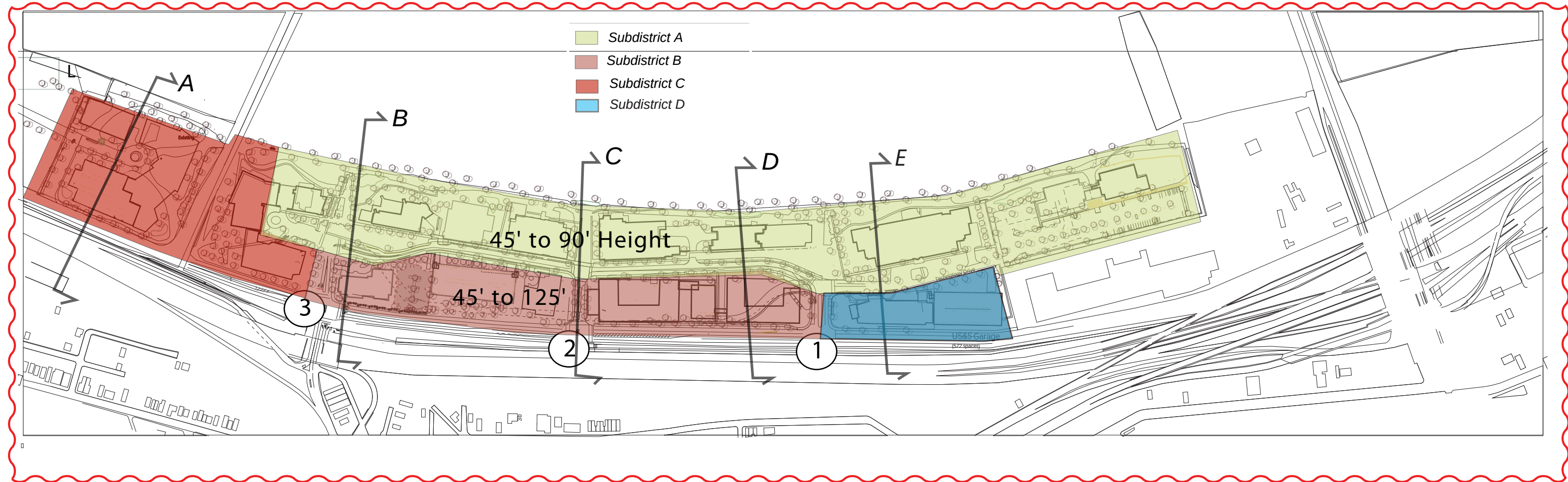
Along The Riverfront, buildings undulate in and out to capitalize on views to and from the site.

Building Width

The maximum building width, as measured from Second Avenue to the Boulevard and the Boulevard to The Riverfront, is 192 feet.

The minimum building width, as measured from Second Avenue to the Bouelvarde and the Boulearde to The Riverfront, is 55 feet.

Build-To Guidelines (cont.)



Building Heights

Four Height Subdistricts are proposed for the Pittsburgh Technology Center, as indicated on the Height Subdistrict Diagram.

All proposed structures over 90' shall submit drawings illustrating the impact of the proposed structure on daylighting and views for the Boulevard and existing buildings.

Height Subdistrict A

The Minimum Height in Height Subdistrict A will be 3 stories and 45 feet above grade.

The Maximum Height in Height Subdistrict A will be 90 feet above grade.

Height Subdistrict B

The Minimum Height in Height Subdistrict B will be 3 stories and 45 feet above grade.

The Maximum Height in Subdistrict B will be 125 feet above grade and conforming with the following requirements:

1. 80% of the Buildable Lot Area will be permitted to a Maximum Height of 125 feet above grade. New buildings are encouraged to respect the heights of existing buildings and utilize appropriate setbacks along the Boulevard and Entries in order to maximize views and daylight into the open space of the site and to both new and existing buildings.
2. The Maximum Average Height of Garage uses in Subdistrict B will be 60 feet and 5 1/2 stories above grade. This requirement shall not be construed as limiting the height of additional uses that are located on top of Garage structures. Uses other than Garages shall be subject to the Maximum Height requirements cited elsewhere in this section.

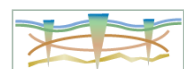
Height Subdistrict C

The Minimum Height in Height Subdistrict C will be 3 stories and 45 feet above grade.

The Maximum Height in Height Subdistrict C will be 180 feet above grade and conforming with the following requirements:

1. The Maximum Average Height of Garage uses in Height Subdistrict C will be 60' feet and 5-1/2 stories above grade. This requirement shall not be construed as limiting the height of additional uses that are located on top of Garage structures. Uses other than Garages shall be subject to the Maximum Height requirements cited elsewhere in this section.
2. 100% of the Buildable Lot Area will be permitted to a Maximum Height of 90' feet above grade.
3. 75% of the Buildable Lot Area will be permitted to a Maximum Height of 125 feet above grade.
4. 50% of the Buildable Lot Area will be permitted to a Maximum Height of 180 feet above grade.

Building Height Guidelines



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Pittsburgh Technology Center PLDP C 7

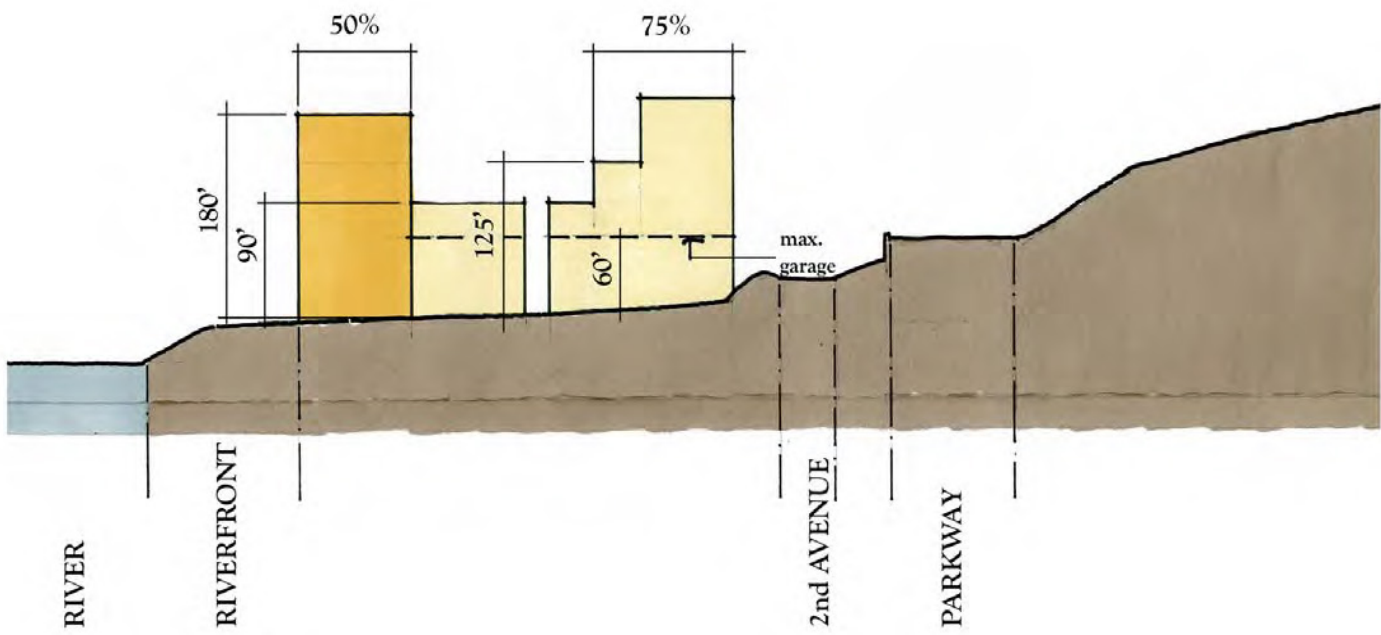
Building Heights Cont.

Height Subdistrict D

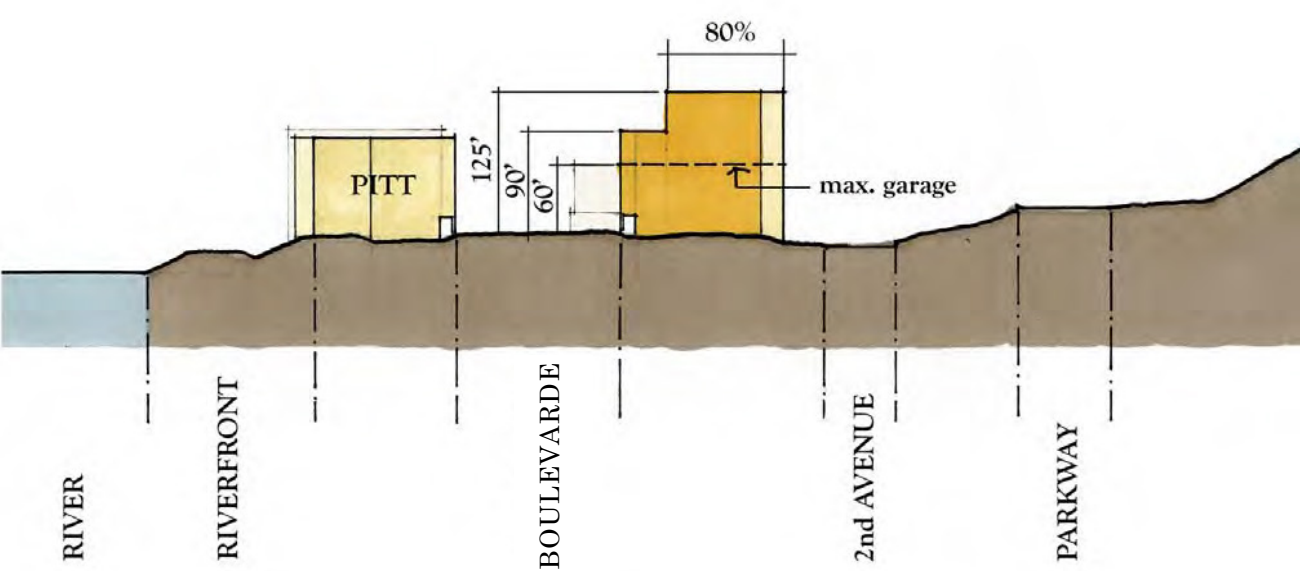
The Minimum Height in Height Subdistrict D will be 3 Stories and 45 Feet above grade.

The Maximum Height in Subdistrict D will be 125 Feet above grade and conforming with the following requirements:

- 1. 80% of the Buildable Lot Area will be permitted to a Maximum Height of 125 feet above grade. New buildings are encouraged to respect the heights of existing buildings and utilize appropriate setbacks along the Boulevard and Entries in order to maximize views and daylight into the open space of the site and to both new and existing buildings.
- 2. The Maximum Height of Garage uses in Subdistrict D will be 90 Feet above grade. This requirement shall not be construed as limited the height of additional uses that are located on top of Garage Structures. Uses other than Garages shall be subject to the Maximum Height requirements cited elsewhere in this section.

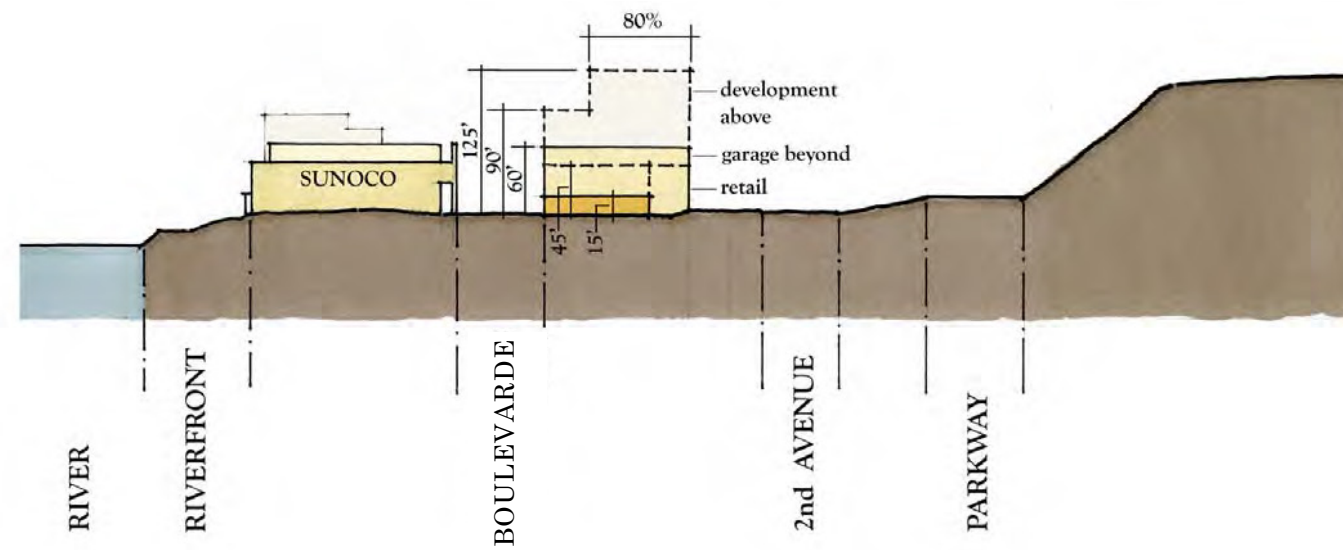


Section A

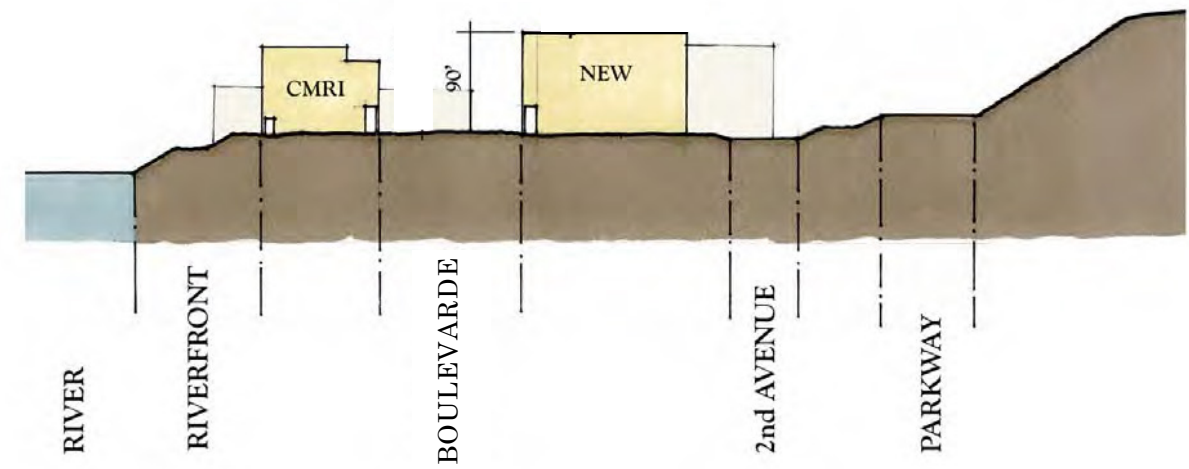


Section B

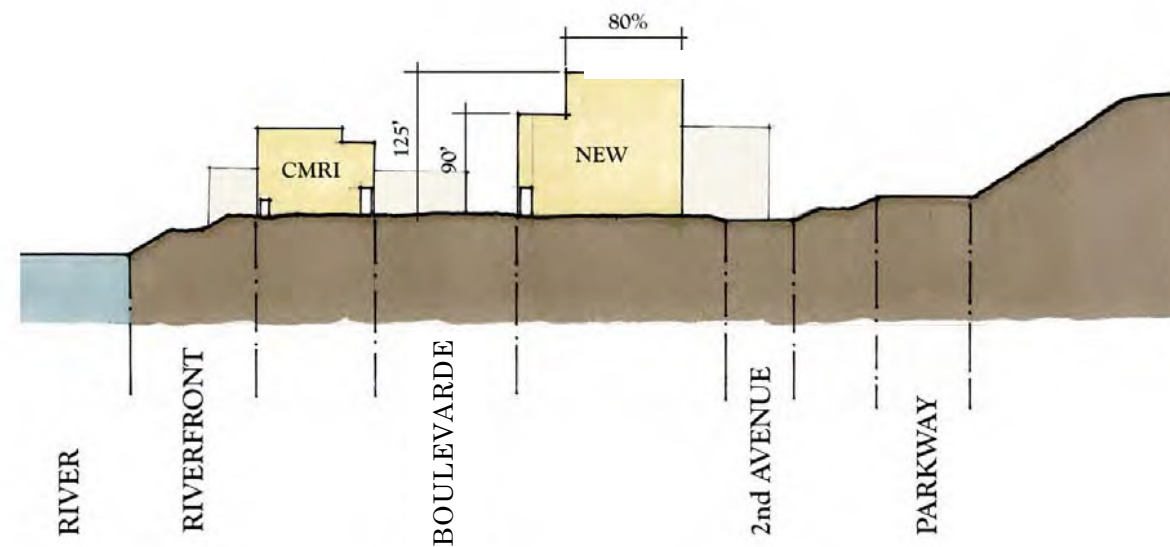
Building Height Guidelines



Section C



Section E



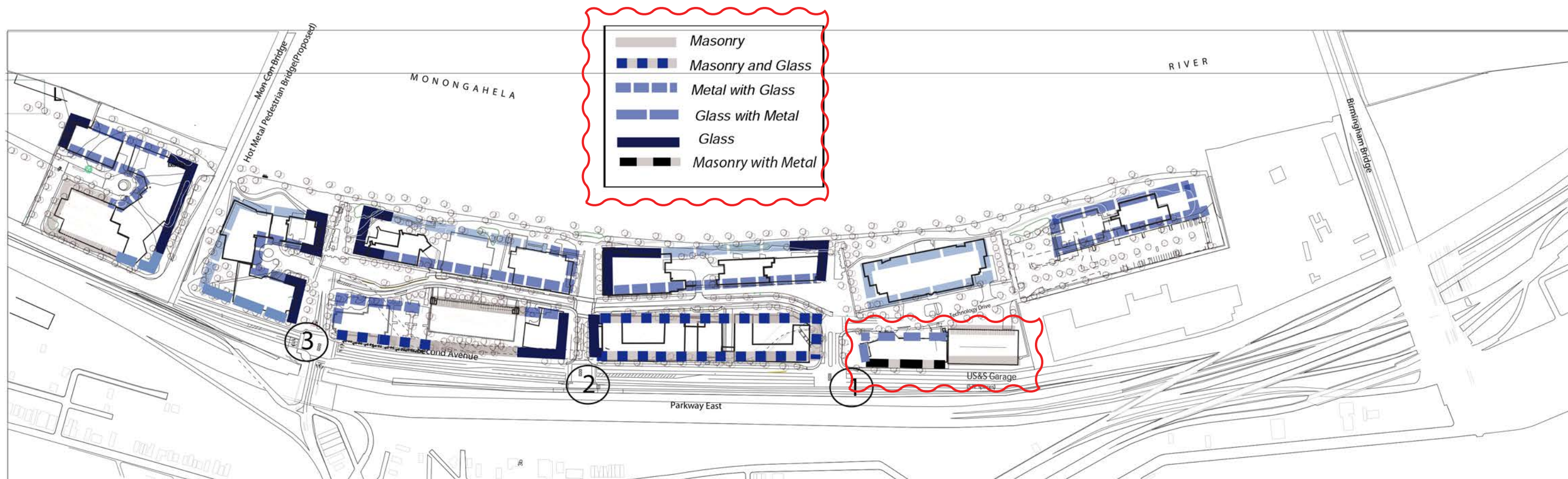
Section D

Building Height Guidelines



ARCHITECTURAL GUIDELINES

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Building Materials

The concept for the site is to recognize the robust scale and archeology of the site's industrial past, while embracing forward-looking architecture and building technologies.

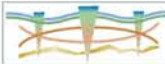
With the site bounded by Second Avenue, which is an extremely hard environment, and The Riverfront, which is flowing and green, the building material strategy is to utilize strong forms made of concrete and stone along Second Avenue, with more delicate expressions in metals and glass, along the river. Along the Boulevard, situated between the two extremes, concrete will be used as building bases while metal and glass materials above will transition between the Second Avenue edge and The Riverfront zone. Building bases in The Riverfront zone are also encouraged to incorporate the vocabulary of archeological concrete bases, as articulated in the river-side façade of the Bridgeside Point building.

Existing buildings on the site provide a palette of metal and glass materials to be

incorporated into new buildings.

Detailed drawings illustrating proposed building materials and their locations on the proposed structures, samples and photographic illustrations of similar installations will be submitted for review as part of each Final Development Plan.

Building Materials



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A predominantly metal façade grounded by a concrete base at the GSA building in San Francisco.



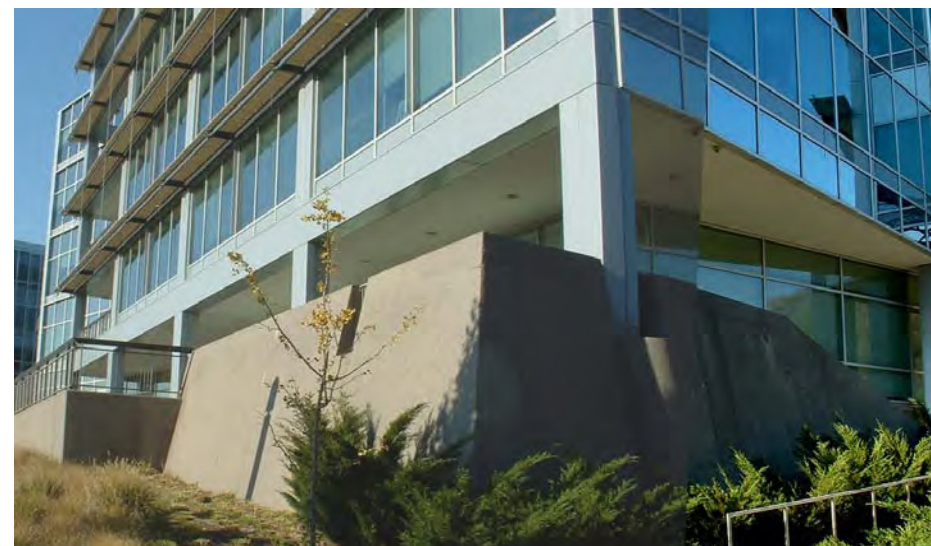
New buildings at the entries and The Greensward should overlay different materials and textures to create rich and intriguing relationships both at and above the ground plane.



Along Second Avenue, buildings should take linear forms in concrete and metals that are easily legible from both the local roadway and the elevated Parkway.



Along the Greensward, buildings are characterized by the use of metal layers in juxtaposition with linear concrete elements and building bases. (University of Pittsburgh Biotechnology building)



Along The Riverfront, metal and glass buildings emerge from concrete bases that are reminiscent of the site's industrial past. (Bridgeside Point building)



Metal screening layers a concrete garage structure.

Building Materials (cont.)



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General

The Pittsburgh Technology Center is characterized by a high degree of building articulation with careful attention to detail and the juxtaposition of materials. New buildings and insertions into the site should reflect this character and care in their composition and assembly.

New buildings will provide first floor arcades along The Greensward, of a similar scale and articulation to those in existing buildings. These arcades serve not only as a sheltered walk, but as a means to articulate facades and address the ground with a human scale.

Retail buildings will incorporate the building vocabulary of Pittsburgh Technology Center, rather than their own iconic corporate branding images.

Ground Floor Articulation

The articulation of the Ground Floors of buildings defines the character of the pedestrian experience and gives a sense of place to the site. In particular, garage uses should locate pedestrian circulation spaces to be visible from public spaces and drives in order to provide additional safety and connection to the site.

Second Avenue

The ground floors of building located along Second Avenue will have strong angular and linear expression, oriented to the character of adjoining roadways. Ground floor expressions along Second Avenue should be consistent with the overall Second Avenue façades. Second Avenue frontages are primary ones for image.

The Greensward

The ground floors of buildings located long The Greensward will have highly articulated form and scale. The arcade lines that have been established by existing buildings should be reinforced by similar treatment on new buildings. These new arcades should be similar height, width and depth as the existing arcades.

Ground floor uses along The Greensward are encouraged to be transparent in nature, including lobbies and windowed offices.

The Riverfront

The ground floors of buildings located along The Riverfront will be highly transparent in nature. Public and semi-public uses, including dining facilities, public restaurants, outdoor patios and other highly visible uses shall be encouraged. Back-of-house uses, such as storage and utility rooms should not be located along the ground floor overlooking The Riverfront.



Parking Garages along Second Avenue are encouraged to express their uses for transit. Forms should emphasize the linear nature of the roadway and site, while incorporating a high-degree of legibility at high-speeds.



Parking garages along the Greensward should incorporate metal layering and details where they are not concrete. Green facade infill is encouraged at the Greensward ground floor.



Ground floors along The Greensward should provide a high-level of pedestrian amenity. The proportions of the existing arcades should be continued in new buildings



Ground floors along Second Avenue are encouraged to incorporate amenities for transit. Forms should emphasize the linear nature of the roadway and site, while incorporating a high-degree of legibility at high-speeds.



Ground Floors along The Riverfront should offer direct connection to the outdoors and promote views into and out of the buildings. Both the Bridgeside Point and Sunoco buildings incorporate outdoor terraces into their ground floors.



Building Articulation



Building Facades Articulation

One of the major assets of the PTC site is the varied opportunities it offers for development. One of the major attractions for image-minded corporations and institutions willing to locate on this site is its location along a very strong arrival corridor or "portal" to the City for those approaching by car along Second Avenue from the East. A sense of arrival is also of primary importance for the entry courts. While taking advantage of this amenity, facades will need to respect the dominant lineal qualities of elements associated with the parkway and the Eliza Works trail.

While this presence provides addressing, which is vital to attracting development, the site also possesses great riverfront amenity offered by the breath of the Monongahela River and the dramatic views of downtown and the South Side Slopes. Accordingly, it is important that facades along the riverfront are activated to take advantage of these visual and physical relationships

Lastly, the development of a sense of place within the development is critical to insure security and a varied experience that seams together various building sites into one larger community. Care will be required to provide an appropriate level of articulation to maintain visual interest within this environment.

The existing University of Pittsburgh Biotechnology, Carnegie Mellon Research Institute and Sunoco buildings establish exemplary standards for the level of articulation and the principles to be employed in facade designs throughout the site. The

facades are composed using layers of materials, with multiple planes being expressed. Interior functions that demand large volumes and no windows are artfully screened in the facades.

Second Avenue / Entrance Courts

The design of facades along Second Avenue should utilize a greater degree of concrete and stone to reinforce the strong relationship to Second Avenue and the Parkway. It is of utmost importance that these be articulated as primary facades equally to those facing the greensward and river. Attention here should be to embellish these facades with traditional responses typical to a strong urban street. This could include the creation and articulation of primary entrances along the base and the creation of an appropriate degree of street level transparency and transparency above in a fashion that is respects the lineal nature of Second Avenue and the Parkway.

The Greensward

Facades located along The Greensward will emphasize a pedestrian environment. Arcades shall be provided at the ground floor. Building bases will be concrete with metal and glass above. Parking garages may have metal screening where they are not concrete.

The Riverfront

Facades located along The Riverfront will be highly articulated and composed of metal and glass. Buildings are encouraged to incorporate concrete forms in the landscape or as building bases, as illustrated by the Bridgeside Point building.



Facades along Second Avenue should be robust in nature and distinctive, in concert with the high level of design that the development is known for.



Along the Greensward, facades emphasize a metal vocabulary and are composed using layering of elements.



Facades along The Riverfront emphasize glass with metal, and undulate to capture views into and out of the site. Large scale concrete bases are evocative of the site's history.

Building Articulation (cont.)





Building Identification signage is artfully integrated with the architecture of the existing buildings.



Existing Site Identification and Site Information signage integrates stone remnants of the site's industrial archaeology with folded metal plates.



Existing Site Identification and Site Information signage integrates stone remnants of the site's industrial archaeology with folded metal plates.

Signage

Site Signage

Site signage, including informational, site identification, and directional signage will maintain the established signage standards for the Pittsburgh Technology Center site, including the use of metal, glass and stone.

Building Identification Signage

The new masterplan will change how existing building signage relates to the site. Consequently, separate Sign Guidelines will be developed at a later date that address existing and new buildings.

Signage



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Green Building Practices

New and existing buildings on the Pittsburgh Technology Center are encouraged to incorporate green building strategies and green practices into both construction and their long-term planning. These practices maximize benefit to building developers, owners, and occupants, while further investing in the long-term sustainability of the site and of the city.

Building Materials

Designers are encouraged to select materials that meet the following standards:

- Materials with a high recycled content.
- Materials made from renewable/rapidly renewable resources.
- Materials that are locally and regionally harvested and/or locally manufactured.
- Wood products harvested using sustainable practices and bearing appropriate certifications.
- Design for standard sizes of materials in order to minimize construction waste.
- Select materials and finishes with low Volatile Organic Compound (VOC) levels.

Building Planning and Operations

Designers, owners and operators are encouraged to:

- Locate building and air intakes away from pollution sources, such as roadways and exhaust ventilation.
- Develop a strategy for ongoing air quality monitoring both pre- and post-occupancy.
- Design for occupant recycling program, including but not limited to recycling of paper, cardboard, metals, plastic, and glass. Such facilities shall be screened from view as required elsewhere in these guidelines.
- Develop maintenance procedures that are based on non-toxic cleaners.
- Incorporate composting facilities into the site planning. Such facilities shall be screened from view as required elsewhere in these guidelines.
- Use mass transportation or van pools for journeys to work by employees of tenants of the proposed development.

Energy Performance

Designers and developers are highly encouraged to maximize the energy performance of the proposed buildings and structures. Recommended strategies include:

- Site buildings to maximize the use of daylight and incorporate passive solar devices into building design.
- Incorporate active solar systems into the building design.
- Locate buildings to take advantage of prevailing summer winds for ventilation and cooling.
- Design mechanical systems for appropriate use patterns and locate in areas accessible for maintenance and service.
- Install high efficiency mechanical and electrical systems that will provide life-cycle energy and cost savings.
- Provide for waste heat recovery, heat sinks or district heating.
- Engage an independent commissioning agent to ensure optimal system performance both pre- and post-occupancy.
- Design the lighting system to allow for varied light levels according to task requirements. Install advanced lighting control systems that respond to exterior light levels and interior daylighting.
- Reduce and/or eliminate CFC's and HCFC's in HVAC&R systems.
- Use highly reflective and light-colored roof materials in order to reduce heat gains, as well as green roofs (planting).
- Design and located the buildings to increase natural ventilation. Wherever possible, provide operable windows that allow for occupant control.
- Design a living or "green" roof system to reduce heat gains, minimize stormwater runoff and provide thermal insulation.
- Install low-flow water fixtures.
- Encourage alternate transportation by providing bicycle parking, lockers, and shower facilities for building occupants.

Green Building Practices



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