

USGBC Detroit Region Student Design Competition 2021



Architecture Design Competition Utilizing LEED v.4 LEED Homes - Multifamily Midrise

DETROIT
REGION

Preamble

The project program is based on support for Detroit nonprofits to advance sustainable urban infill housing in the city. The work will be based on the LEED metric system. The program entrants are encouraged to contribute ideas and visions for future projects in the area that promote innovation and best examples in architecture and planning practices. Entrants are encouraged to review recent studies to address new housing models for socially sustainable and equitable development practices.

(<https://www.jchs.harvard.edu/calendar/pursuit-equitable-development-lessons-washington-detroit-and-boston-virtual>).

In addition entrants would benefit from research examining the restructuring of Detroit identified as a 'shrinking city' due to a declining population and employment.

(<https://dusp.mit.edu/cdd/publication/restructuring-detroit>). The competition project is based on an actual project being developed by Summit Commercial LLC, in partnership with the Detroit Building Authority, the City of Detroit's Housing and Revitalization Department and their Planning and Development Department. Information below is based on their Request for Proposal (RFP) at the following link: <https://bit.ly/2T5Jm3Z>

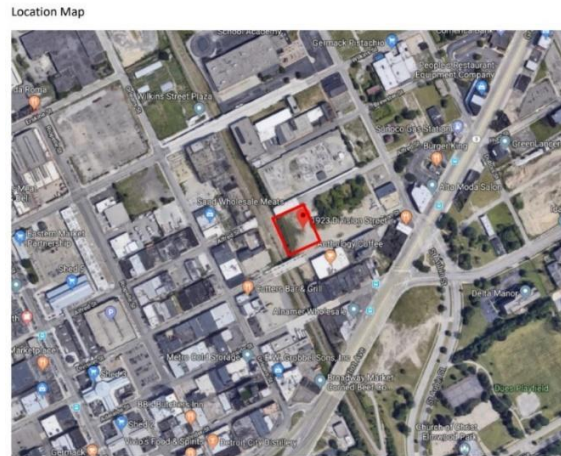


Studio BELEM, post covid-19 housing 'aula modula' project. DEZEEN.

This program includes additional information beyond the RFP added by the USGBC Detroit Region Student Competition Committee for the sake of clarity and consistency with the USGBC competition goals for the purpose of providing a more enhanced set of educational requirements for students. No use of the information provided is to be inferred or endorsed by the authors of the RFP as relevant to the professional RFP and is only for the use by students entering this USGBC Detroit Region Competition. We thank the City of Detroit and Summit Commercial LLC for their permission to share this information with students.

Project Overview:

In partnership with the Detroit Building Authority (DBA), the City of Detroit's Housing and Revitalization Department (HRD) and Planning and Development Department (PDD) issued an RFP on August 31st of 2020 to seek applications from qualified development teams to construct a new mixed-use, mixed-income housing development in the Eastern Market area. The development site ("Property"; "1923 Division") is located at the northeast corner of Division and the Dequindre Cut Greenway in Detroit, MI. The Property comprises one parcel (1923 Division) and measures approximately 0.963 acres (41,948 square feet). The maximum height for residential in the area is proposed to be four floors and five floors for a mixed-use project. The competition entrants may exceed this to six floors maximum, however, taller building heights should be away from sidewalk peripheral areas and be on the interior of the site. The development of this site will create a model for future private development along the Dequindre Cut Greenway, therefore the City of Detroit will consider submissions for a catalytic project that:



1. Includes sustainable design principles which are based largely on demonstration of LEED for Homes-Multifamily, Version 4.0, as well as those described below in the documents.
2. Incorporates ground floor commercial space, at both grade levels on the site.
3. Provides mixed-income residential opportunities (approx. 124,369 Gross Square Feet proposed)
4. Creates publicly accessible frontage at the Dequindre Cut level that extends to the Dequindre Cut's public space via courtyard and/or setback.

Additional Site Information is available from the USGBC Competition website Under Architecture Project/Site Information

Successful Architecture Design Proposal submissions will:

1. Demonstrate excellence in sustainable mixed-use urban design.
2. Evidence of high achievement in design outcomes based on LEED BD+C criteria.
3. Have a context and site based upon a mixed-use high quality development, coupled with a commitment to creating sustainable well-designed housing.
4. Provide a housing program that includes a minimum 20% rentals set-aside for households making 80% of the area median income or lower.
5. Align uses with the anticipated zoning update Market and Distribution District (MKT).



Ely Court, Allison Brooks Architects, UK, 2015
(ArchDaily)

Guiding Development Principles:

The City of Detroit is committed to advancing design excellence in all projects, which will produce equity, sustainability, resilience, and healthy living for those who live, work, and play within and around project areas.

Accordingly, entries shall exhibit walkable urban design principles, sustainable neighborhood development strategies that may include a variety of uses and appropriate building typologies with a variety of architectural expressions. Buildings shall be designed in proper form and function within the neighborhood context.

Reinforce the Public Realm:

1. Buildings should define the public space of a street or park in a meaningful way.
2. Mixed-use structures should be designed in such a way as to allow observation of the street.
3. Buildings generally should have minimal front lot line setbacks. Well-designed, varying setbacks (discontinuous with the lot frontage) will break up blocks and provide relief for the pedestrian.
4. The built environment should provide interesting building typologies with varied architectural expressions, and should be designed to complement the community.



Eastern Market Housing / Mixed Use project Perkins and Will Architects, 2020.

<https://perkinswill.com/project/eastern-market/>



Curbed Detroit Eastern Market and Neighborhood Needs
<https://detroit.curbed.com/2017/11/7/16619930/planners-neighborhood-eastern-market>

Sustainable and Equitable Development

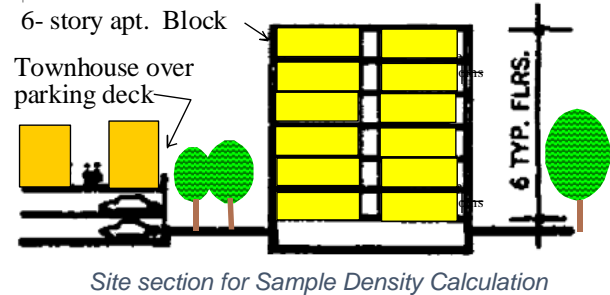
1. Provide a diverse residential stock and density at a variety of price points, ownership types (i.e., rent, own), housing types (i.e., lofts, flats, apartments), and a minimum balance of 80% market rate and 20% affordable units.
2. Densities shall support opportunities for neighborhood commercial investment and jobs creation, thereby stimulating and supporting growth in the local economy.
3. Design for environmental sustainability - both in the natural (i.e., wetlands, natural plant species) and built environment (i.e., stormwater mitigation, LED lighting, renewable energies).
4. Meet City of Detroit Post Construction Stormwater Ordinance performance standards by designing, constructing and maintaining stormwater practices on the site.

Residential Density Parameters

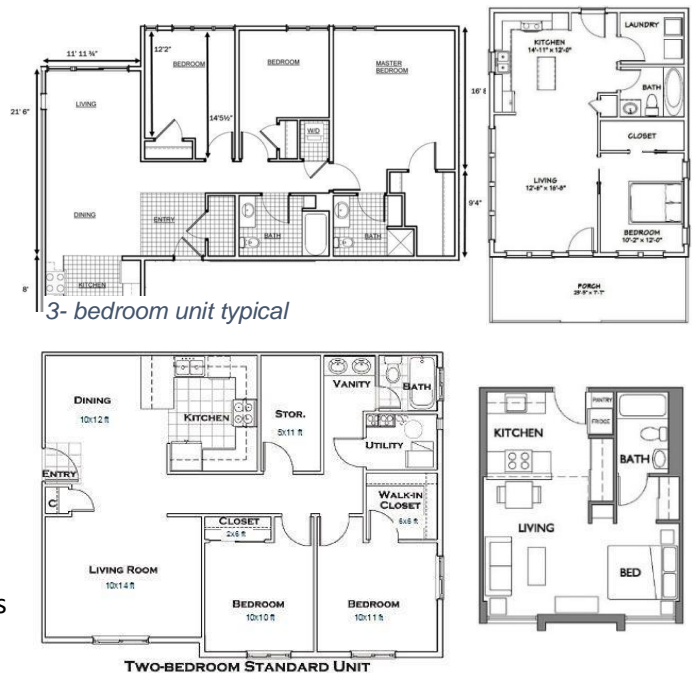
Density is expected to be between 75 and 90 dwelling units/acre on the site area.

For references see; <https://www.cacities.org/Resources-Documents/Education-and-Events-Section/Planners-Institute/2019-Session-Materials/Understanding-Density-And-Development-Intensity>

Sample Density Calculation:



The example density calculation above is from the book *Housing*, by John Macsai, et.al. The site is $535' \times 270' = 3.3$ acres. This scheme includes six story apartment buildings with 40 units per building for a total of 240 units. This figure is reduced by two units per building to account for lobbies for an adjusted total of 232 units. The resulting density is $232\text{units}/3.3\text{ acres} = 70$ units per acre. If 16 townhouses were placed on top of the garages then the density is 75 dwelling units/acre. The parking is on two levels accommodating 290 cars (1.25 per unit). Parking areas can be estimated at 300 sf/car. The top of the garage structure serves as plaza or recreation space @ 42,000 SF and 11,000 SF is dedicated to landscape/open space as well where 37% is considered open space. Typically open space is approximately 35% -25% of a site area.



Programmed Spaces:

The residential unit mix is as follows:

35-40%, 2-bedroom units @ 750-850 SF

20-25% 1-bedroom units @ 600-650 SF

20-25%- efficiency units @ 450-600 SF

5-10%- 3-bedroom units @ 900-1100 SF

Samples of typical unit types are shown.

Residential units should have 2% minimum of total units as ADA compliant units. All common and outdoor areas are to be ADA compliant as well. ADA units could be at grade and have small private yards for large units. The units should include some outdoor patio decks or patio spaces. Grades levels should have 10% of the footprint as service/docking and storage. Retail is expected to have very few parking dedicated stalls for owners 5-9 for tenants. Daylight is needed for all unit main living areas and highly recommended for all bedrooms.

Relevant Housing modalities are Urban Infill Housing, Sustainable Housing, live-work units, Multi-generational housing, Affordable Housing, and Social Housing. The relevant housing typologies are as follows; low rise and mid-rise units, townhouse units, courtyard housing and carpet type housing.

Residential Program Summary:

Total SF @ 83 Dwelling Units/Acre

Apartment Type Mix SF/Unit Unit % Total Quantity

Projected Total of all Apartments is 80 units

2-Bedroom units	750-850 SF	35-40%	28- 32	21,000-27,200 SF
1-Bedroom units	600-650 SF	20-25%	16-20	9,600- 13,000 SF
Efficiency/Micro units	450-600 SF	20-25%	16- 20	7,200- 12,000 SF
3-bedroom units	900-1100 SF	5-10%	4-8	3 600 –8,800 SF

Include laundry in unit

Total Area (SF)

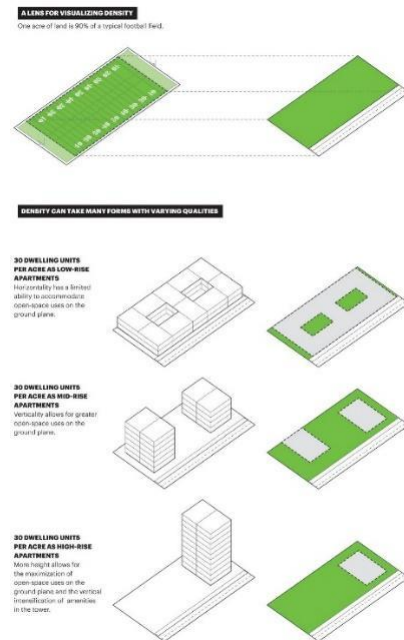


Illustration of density and housing massing.

35,300- 53,100 SF

Note: When developing the massing and distribution of the housing units, the entrants should make efforts to understand the relationships in the project to balance overall site/project quality and financial viability when establishing final density and housing program size above for the total of all residential units as a measure of the total sq. feet based on the table/chart above of sq.ft. ranges varied by percent unit allocation and the varying apartment unit sizes.

Residential Support Uses/Spaces

Square Feet

Laundry Rooms 2-3	750 SF
Restrooms	250 SF
Bike Parking/Storage (resident locker storage in garage)	1,500 SF
Lobby/Mail Rooms	1,500 SF
Gross Mechanical and Circulation @15%	1,400 SF
Total Residential Program (SF)	44,230 - 66,400 SF

Residential Living and Quality of life Issues: The program challenges entrants to imagine new possibilities for the future of urban living. What is the relationship between the individual dwelling unit and the collective aggregation of units? How does a large housing development inculcate a strong sense of community through its programming, organization, and form? What is the relationship between interior and exterior spaces, uses, and views and how is daylighting incorporated into each unit? What are the health issues related to the choice of materials and how can the use of timber and wood be leveraged to create living spaces that are connected to natural systems and biophilic responses to constructed environments? Residences in this project are a mix of small units for single or double occupancy and larger, family-based units with more than one bedroom. All apartments must have exposure to natural light and air, as well as rooms that meet egress and building code requirements for occupancy/size.

Community Wellness Center. Linked to residential uses and could be part of grade level uses.

The community wellness center will serve predominantly residents of the on-site housing and also residents and workers from nearby neighborhoods. The center will include a range of spaces for individual and group exercise, as well as multifunctional large-span spaces for indoor team sports that are envisioned to be able to serve community- wide events. The intersection between the fitness area and the park or open spaces are key site conditions to consider in the organization and design of this component of the project.

Entry /lobby	1,000 SF
Large Open Indoor Track/Court Sports	7,500 SF
Weight Cardio/Exercise	2,000 SF
Group Fitness Classes	750 SF
Locker Rooms /Restrooms	700 SF
Staff Offices	500 SF
Gross Mechanical/Circulation @ 15%	1,865 SF
Total Area (SF)	14,320 SF

Community Education Meeting Center linked to residential uses and could be part of grade level uses.

Complementing the residential portion of this project is the integration of early childhood education center for children between the ages of 6 weeks and 5 years (infants through pre-kindergarten). With changes in family structures and the increasing requirement that both parents work to meet the challenges of living in cities, the role performed by early childhood education centers in the long-term development of children is increasing in importance. This competition asks students to consider the spatial, material and organization of this educational facility in the development of young children. Attention needs to be placed on the choice of materials to support the growth of infants and young children whose bodies are highly susceptible to the influence of their environment, and the interrelationship between interior learning space and exterior playscapes in a city where children have limited access to outdoor learning environments.

The early childhood education center will provide individual classrooms broken down by age, from infant continuity rooms, to preschool and then prekindergarten. Children attending this facility are to be drawn from the new housing on the site, and the surrounding neighborhood. These classrooms are complemented by gross motor rooms (playrooms), indoor and exterior play/inquiry area, and staff and administrative support spaces.

Lobby	500 SF
Classrooms-2 @ 15 Children with Single Unit WC/Sink and Laundry Unit	900 SF
Indoor Multi-Use Room with Dividers to Make 2 Classrooms	1,800 SF
Indoor Play Room	1,000 SF
Administration Offices (3) and Conference Room	450 SF
Restrooms	200 SF
Total Area (SF)	4,850 SF

OVERALL PROGRAM SUMMARY

Total SF Residential/Community/Recreation **85,570@ 68% of Gross SF**

Total Retail spaces. Retail located at grade levels upper and lower 36,000-38,000 SF @ 32% Gross SF

Maximum Program Development Space **124,370 GSF 100%**

Program Summary Site Allocations and Overall Massing Areas Site Area Available = 41,948 SF

Assuming Landscape/Open Space @ 30%- 35% 12,600 SF - 14,680 SF

Surface Level Drop Off/Parking & Loading @ 10%- 15% 4,200 SF - 6,300 SF

Housing, Supporting comm. & Retail Area Footprint @40%-50% 17,000 SF – 20,950 SF

Total Site Footprint above Grade **80%-100%** **33,800 - 41,930 SF**

Parking Residential @ .75/Stalls/Unit & 60 Stalls + 6 Retail + Resident Unit Storage 50 SF/unit @3,000-4,000 SF total

Parking: 66 x 300 SF/car= 19,800 SF - For a One Level Parking Structure **19,800 SF**

At Subgrade is 70' X 282' In Area approx. equals 47% of the Site

The overall building footprint for community/housing/retail is approx. 16,800 SF with an average height of 4 floors for housing and 2 floors for community and retail spaces for 6 floors above grade and above program spaces. This should preserve adequate open space and the parking needed.

Retail/office spaces.

Retail should be on both grade levels but some residential units could be at grade level. There may be two grade levels; they should have 10% of the spatial footprint as service/dock area and storage. Retail is expected to have very few parking dedicated stalls for owners 5-9 for tenants.

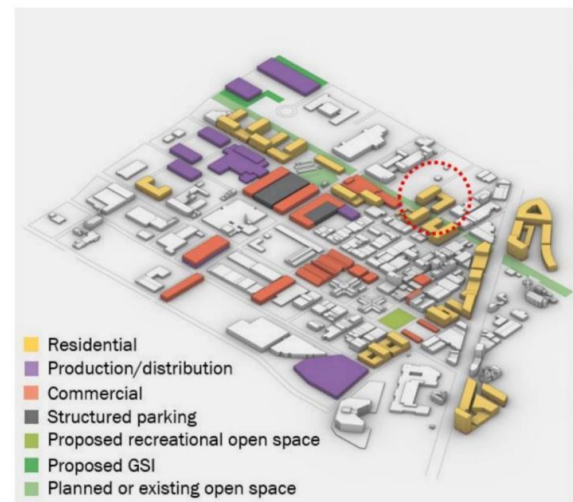
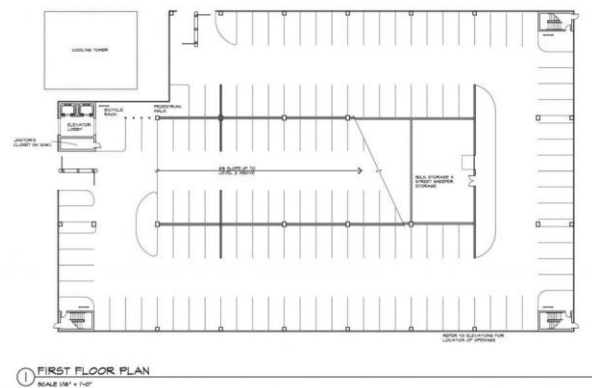


Typ. Office and retail tenant space

These program spaces should demonstrate sustainable design practices.

Parking Guidelines:

1. Minimize land surface area dedicated to parking in order to maximize the site for development.
2. Parking shall not be designed fronting a street without sufficient screening and buffering. Furthermore, parking shall be buffered with screening, buildings, or landscape. Parking is expected to be in one level below grade and some could be at the lower grade level. Per the City of Detroit Zoning Code Sec. 50-14-49, Retail, Service, and Commercial uses located on land zoned SD1 or SD2: services and commercial uses located on and zoned as SD2, the new proposed program supports rezoning to SD4- SD5or PD (Planned Development). The parking ratio is - 0.75/unit of the minimum for off street parking requirements because it is within 0.25 miles of bus rapid transit (Gratiot). Sec. 50-14-34. - Household living. – For loft and multi-family 1.25/ dwelling unit. This may also be reduced to 0.75/ unit because it is within 0.25 miles of bus rapid transit (Gratiot).



3. Parking lots shall be screened from upper unit views, with trees or trellises.
4. Vehicular access should be located so as to minimize, if not avoid, conflicts with the pedestrian, utilizing alleys, where possible.

5. Bicycle parking should be located so as to minimize, if not avoid, conflicts with pedestrians, utilizing alleys and adequate shelter, where possible.

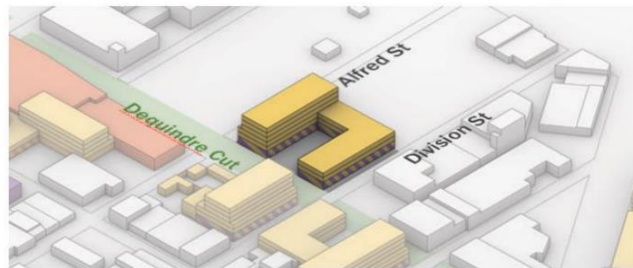
Zoning Guidelines - MKT

Market and Distribution District (MKT) The City of Detroit Planning Commission and Planning and Development Department are currently conducting a zoning update for the Eastern Market area, establishing a new zoning classification; MKT- Market and the new proposed program supports rezoning to SD4- SD5or PD (Planned Development).

Distribution District. All entries for the site must demonstrate a willingness to develop the site, consistent with the final zoning update. Zoning update drafts and progress can be found on the City of Detroit's Planning website <https://detroitmi.gov/departments/planning-and-developmentdepartment/neighborhood-plans/central-design-region/eastern-market>.

Development Program & Schematic Massing Guide:

The provided massing diagrams are based on the Eastern Market Framework Plan and the attached zoning requirements and PDD design values



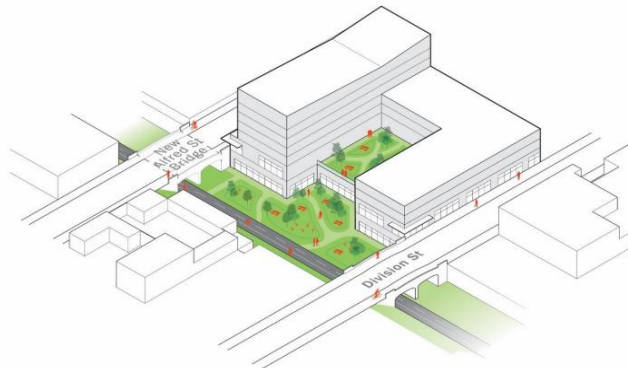
Building Codes:

Michigan Building Code based on IBC 2015 and Current ADA code.

ASHRAE 189.1 High Performance Code.

LEED and Sustainable Architecture and Design Goals:

The project will be evaluated by the jury based on the judging criteria found on the website.



Site Development: The project should reflect an understanding of the Detroit Eastern Market planning and development guidelines to foster the following: enhance and extend mixed -use urban development with walkable communities; links to public transportation; foster alternative means of transportation; biking or scooters; promote ride sharing and carpooling; use of electrical vehicle charging stations; and shared parking to reduce the number of spaces for cars. Parking areas should make use of passive ventilation when possible and minimal electrical use. LEED credits for the site should be considered in the project development.

Site Public Spaces, Water Conservation and Landscape: The project should consider use of both hardscape and softscape to incorporate PV lighting, bike storage, permeable paving, low maintenance native plants and plant materials should

relate to building design to augment passive climate controls. Water recapture should be considered to reduce stormwater runoff. Open spaces should be safe, well lit, and promote resident care and concern for common areas. Use of urban gardening, low- water/maintenance landscapes, and permaculture is encouraged. Use of harmful pesticides, and gasoline-based maintenance equipment is discouraged. Spaces should support a variety of age groups and activities for healthy living.

Sustainable Building Systems/Energy and Water

Conservation: Submissions should be designed with applications in emerging building and construction practices involving the use of modular and prefabrication-based systems to improve energy conservation that provide cost competitive, high quality projects. The selection of building systems, structural, mechanical, electrical and envelope should be selected to advance recognition of LEED credits for resource conservation, reflect current and emerging sustainable building systems, and display practices such as AIA COTE “ long life-loose fit” principles, and Passive Haus practice. Plumbing, electrical and HVAC systems should demonstrate material conservation and the use of energy modeling, alternative energy and water conservation should be demonstrated with evidence- based methods for proof-of-concept results to validate the LEED credits claimed.

Materials and Resources:

Projects should demonstrate use of a careful selection of products that indicate the use of Life Cycle Assessment (LCA) software, Environmental Product Declarations (EPD) and other certifications that validate sustainable material selection. Entrants should pursue Cradle-to Cradle, and Circular Economy based models that indicate locally available, sustainable products with recycled content and renewable resources. Materials and systems should demonstration durability and low-maintenance aspects. Housing and facility design should incorporate recycling of waste, and low-polluting and natural cleaning products. Construction management should consider recycling construction waste on site.



Old Central Railway Socially Sustainable Carbon Neutral Development, Paris, France. Sept. 2019
(ArchDaily) [SLA](#) and [BIECHER ARCHITECTES](#),



Camel Back, Sponge Garden, Shot Gun Prefabricated Sustainable Housing Project, Anderson and Anderson, New Orleans, 2007



Passive Haus, "Bruck" / Peter Ruge Architekten, (Arch Daily), 2013

Indoor Air Quality: Entries should demonstrate the means to provide reliable air quality and natural ventilation that advanced energy conservation, promote active building commissioning practices to optimize energy utilization and use whole building energy management software, use of low polluting materials, and efficient and effective venting of enclosed parking areas.

Innovation: Entrants are encouraged to expand conventions and know practices to explore new ideas to promote social and resource sustainable practices and develop opportunities for resident and visitor education and engagement in maintaining and caring for a sustainable environment.

Regional Priorities: Entrants should review and follow the Guiding Development Principles in the program cited above and Municipal planning goals for the Eastern Market District.

Reference and resources, case studies are available to entrants on the competition webpage. Project Submission should include the following:

- 1) An executive summary of 500 words maximum. A narrative of the entrant's approach to the architecture and site development of the 1923 Division site, including proposed unit mix and proposed rental rates.
- 2) Project Intent based on proposed site massing and/or schematic plan, livability and context related factors.
- 3) A conceptual design proposal that includes:
 - a) Schematic site plan indicating major site spaces and areas with explanations of concepts.
 - b) Development displaying the programming plan/social equity/ low income and market rate units, and a site context analysis
 - c) Site land use map and pedestrian plan, public transit access and parking solutions
 - d) Conceptual 3D massing street exterior views
 - e) Conceptual 3D rendered views (at least one that that shows the desired end result or design intent of the development)
 - f) Conceptual diagram with overall parking approach and total parking count and ratio of stalls/unit



[MVRDV](#) winning modular prefab project entry in a post-industrial site at tip of the Kiel Fjord, Germany 2019.



BIG Bjarke Ingels' architecture studio BIG has completed a [modular](#) apartment block called 79 & Park in [Stockholm](#)


g. Drawings of all floor plans, enlarged dwelling unit places and proposed retail commercial tenant profile plans, with data on program space allocations for residential/commercial areas and density.

h. Minimum of at least two major building sections.

i. Drawings and diagrams illustrating the final density and program space allocations, major conceptual framework, physical design strategies and design method/processes as related to architectural merit, response to site/climate and user needs-based strategies, building systems, and systems integration strategies.

j. Drawings, diagrams, computer simulation analysis data charts indicating major LEED-based sustainability outcomes.

k. An 8.5 x 11 supplement booklet, 30-page maximum with 300-500 word Summary Description of each LEED credit, using evidence-based outcomes, and data charts of how the project met sustainable outcomes through LEED metrics- see chart below. The actual LEED checklist can be found on the competition website.



LEED v4 for Building Design and Construction: Homes and Multifamily Lowrise
Project Checklist

Y ? N
Credit Integrative Process 2

0	0	0	Location and Transportation	15
Y			Prereq Floodplain Avoidance	Required
PERFORMANCE PATH				
			Credit LEED for Neighborhood Development Location	15
PRESCRIPTIVE PATH				
			Credit Site Selection	8
			Credit Compact Development	3
			Credit Community Resources	2
			Credit Access to Transit	2
0	0	0	Sustainable Sites	7
Y			Prereq Construction Activity Pollution Prevention	Required
Y			Prereq No Invasive Plants	Required
			Credit Heat Island Reduction	2
			Credit Rainwater Management	3
			Credit Non-Toxic Pest Control	2
0	0	0	Water Efficiency	12
Y			Prereq Water Metering	Required
PERFORMANCE PATH				
			Credit Total Water Use	12
PRESCRIPTIVE PATH				
			Credit Indoor Water Use	6
			Credit Outdoor Water Use	4
0	0	0	Energy and Atmosphere	38
Y			Prereq Minimum Energy Performance	Required
Y			Prereq Energy Metering	Required
Y			Prereq Education of the Homeowner, Tenant or Building Manager	Required
PERFORMANCE PATH				
			Credit Annual Energy Use	29
BOTH PATHS				
			Credit Efficient Hot Water Distribution System	5
			Credit Advanced Utility Tracking	2
			Credit Active Solar Ready Design	1
			Credit HVAC Start-Up Credentialing	1
PRESCRIPTIVE PATH				
Y			Prereq Home Size	Required
			Credit Building Orientation for Passive Solar	3
			Credit Air Infiltration	2
			Credit Envelope Insulation	2
			Credit Windows	3
			Credit Space Heating & Cooling Equipment	4

Project Name:
Date:

EA PRESCRIPTIVE PATH (continued)				
			Credit Heating & Cooling Distribution Systems	3
			Credit Efficient Domestic Hot Water Equipment	3
			Credit Lighting	2
			Credit High Efficiency Appliances	2
			Credit Renewable Energy	4
0	0	0	Materials and Resources	10
Y			Prereq Certified Tropical Wood	Required
Y			Prereq Durability Management	Required
			Credit Durability Management Verification	1
			Credit Environmentally Preferable Products	4
			Credit Construction Waste Management	3
			Credit Material Efficient Framing	2
0	0	0	Indoor Environmental Quality	16
Y			Prereq Ventilation	Required
Y			Prereq Combustion Venting	Required
Y			Prereq Garage Pollutant Protection	Required
Y			Prereq Radon-Resistant Construction	Required
Y			Prereq Air Filtering	Required
Y			Prereq Environmental Tobacco Smoke	Required
Y			Prereq Compartmentalization	Required
			Credit Enhanced Ventilation	3
			Credit Contaminant Control	2
			Credit Balancing of Heating and Cooling Distribution Systems	3
			Credit Enhanced Compartmentalization	1
			Credit Enhanced Combustion Venting	2
			Credit Enhanced Garage Pollutant Protection	2
			Credit Low Emitting Products	3
0	0	0	Innovation	6
Y			Prereq Preliminary Rating	Required
			Credit Innovation	5
			Credit LEED AP Homes	1
0	0	0	Regional Priority	4
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
0	0	0	TOTALS	Possible Points: 110

Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110

(END of PROGRAM)