MARKET GARDEN

Beyzavi, Gehlot, Snyder

Hansen / Grabner

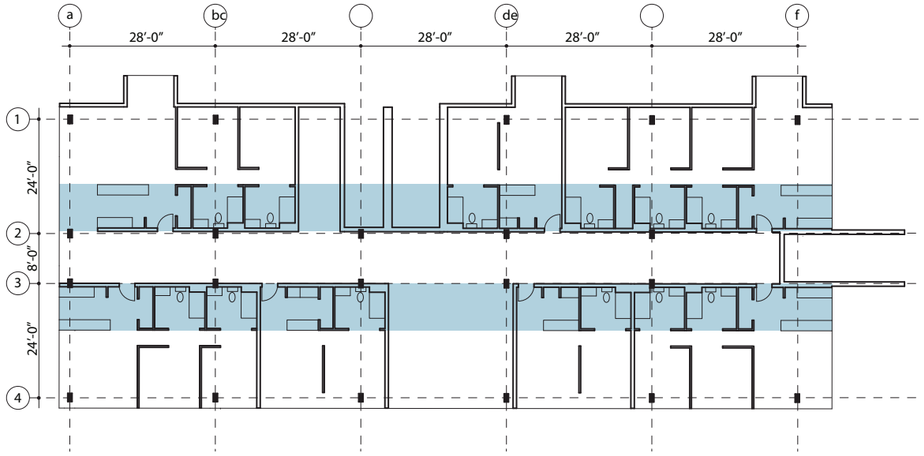
Schematic Structural Concepts

Building Data:

Type of Construction	Type IV
Site Location Seismic Rating	Zone 1
Site Specific Wind Speed 3s gust	120 mph
Residential Live Load	40 psf
Market Live Load	100 psf
Roof Live Load	100 psf
Parking Live Load	40 psf
Parking Impact Load	3000lb / 4.5”x4.5”
Ground Snow Load	20 psf
Structural Frame Type	Heavy Timber
Structural Materials	Glue Laminated
Structure Fire Rating Period	120 minutes

Design Narrative:

Schematic Design - The building massing and organization was created according to site composition, but the proportions were driven by our structural grid. We wanted our structure system to be enviornmentally friendly while creating a sensorial experience for the residents and market goers.



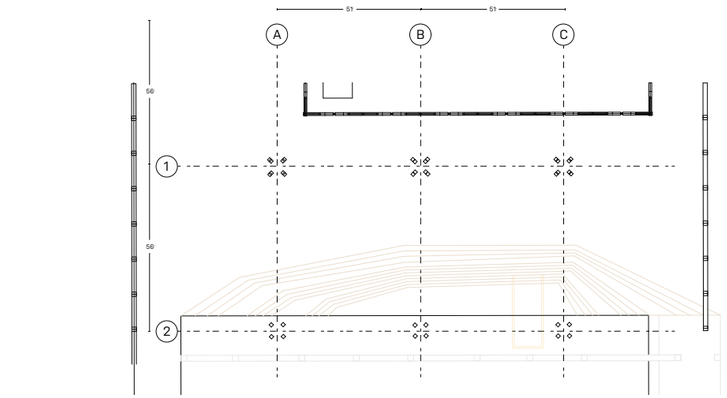
Structural Scheme Housing Column Grid / Gluelam / Plan

Primary grid spacing
The primary grid spacing is 28’-0” column spacing to align with the heavier parking structural grid.

Secondary Spanning system sizing
The secondary spanning system is 5 layers of Cross Laminated Timber (CLT) approximately 8” in depth with a 2” reinforced concrete topping poured over it.

Primary Spanning system sizing
The primary spanning system is Glue Laminated Beams that are 10” wide by 24” in depth allowing a clear space of 27’.

Vertical bearing system sizing
According to precedent like T3 in Minneapolis by MGA, and Brock Commons Tallwood House in Vancouver by Acton Ostry Architects the typical column sizing for a 9 story tall structure should be



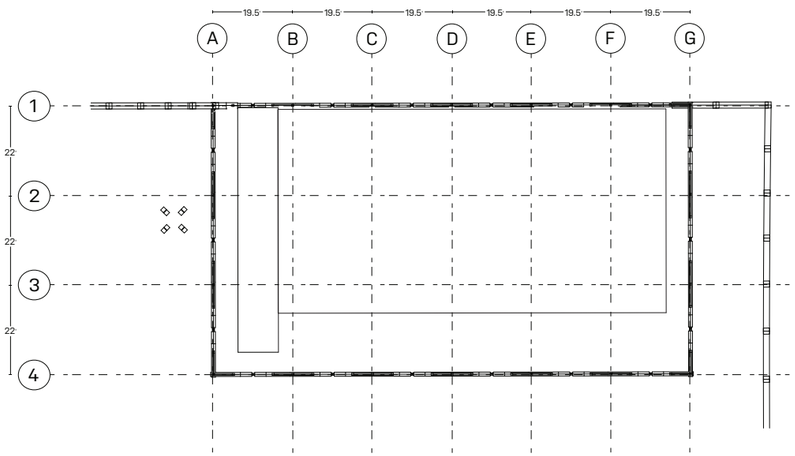
Structural Scheme Market Column Grid / Gluelam / Plan

Primary grid spacing
The primary grid is 56’ by 51’.

Secondary Spanning system sizing
The secondary spanning system is the gluelam diagrid structure that supports the floor system.
The diagrid structure increases in depth depending on the span and distance from the column system. Ranging from 48” depth and 18” depth.

Primary Spanning system sizing
The primary spanning system are tappering gluelam girders that transition to gluelam diagrid system that supports the floor system. The girders range from 8’ depth by 4’ width to 4’ depth by 2’ width.

Vertical bearing system sizing
The vertical quad column system allows for 56’ spans across the market area and allow for the floor above to be traversed. The columns are in groups of four that are each 24” x 24”.



Structural Scheme Community Center Diagrid / Gluelam / Plan

Primary grid spacing
The structural grid spacing is 19’ - 6” by 22’.

Secondary Spanning system sizing
Calculate spanning system area and select appropriate system and size (depth and breadth).

Primary Spanning system sizing
The primary spanning system is a series of large Gluelam beams that are 72” in depth across the short span and in the long direction there is a gluelam truss.

Vertical bearing system sizing
The exterior diagrid structure carries the vertical loads from the interior of the building. The diagrid structure is 16” width by 24” depth.

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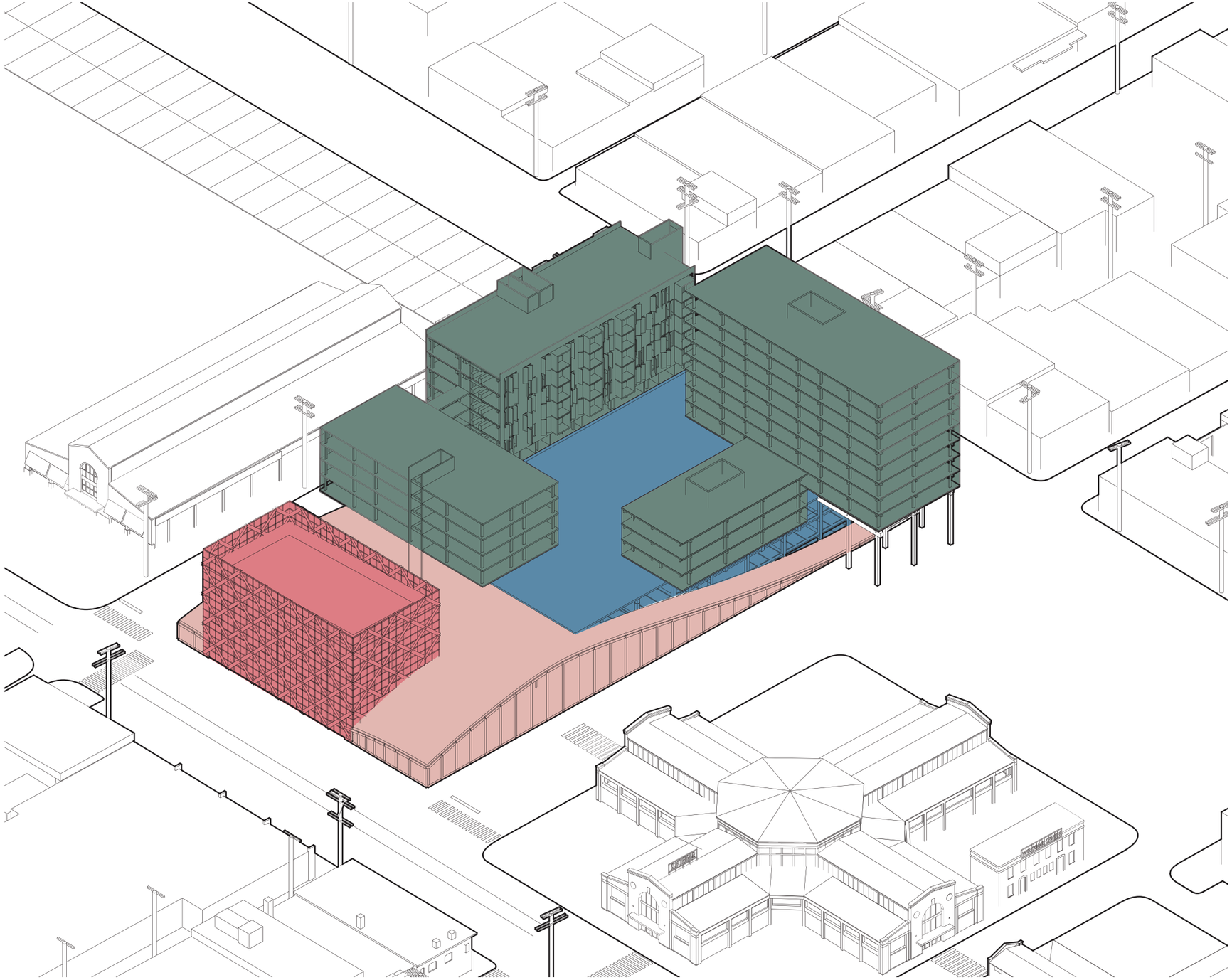

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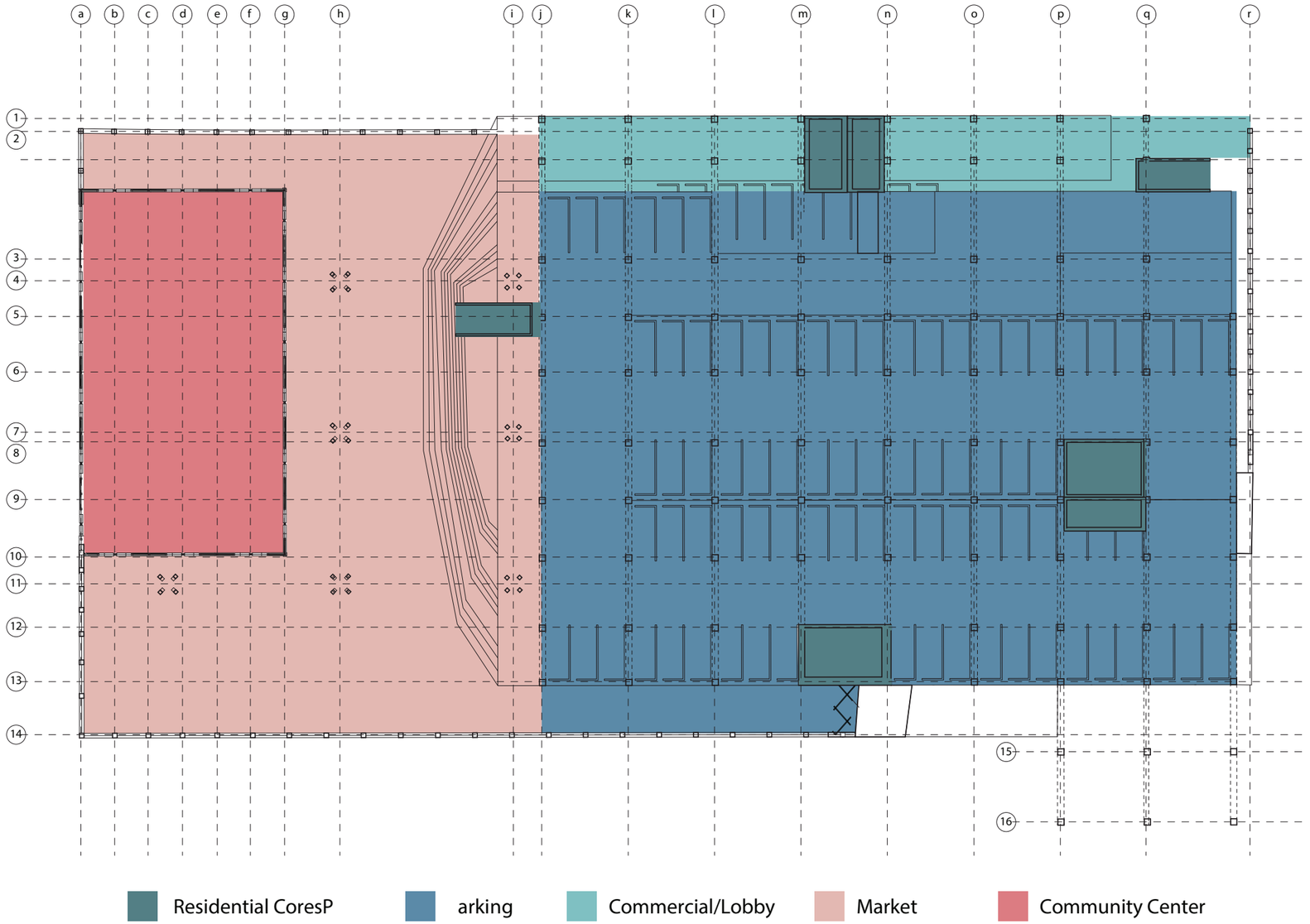

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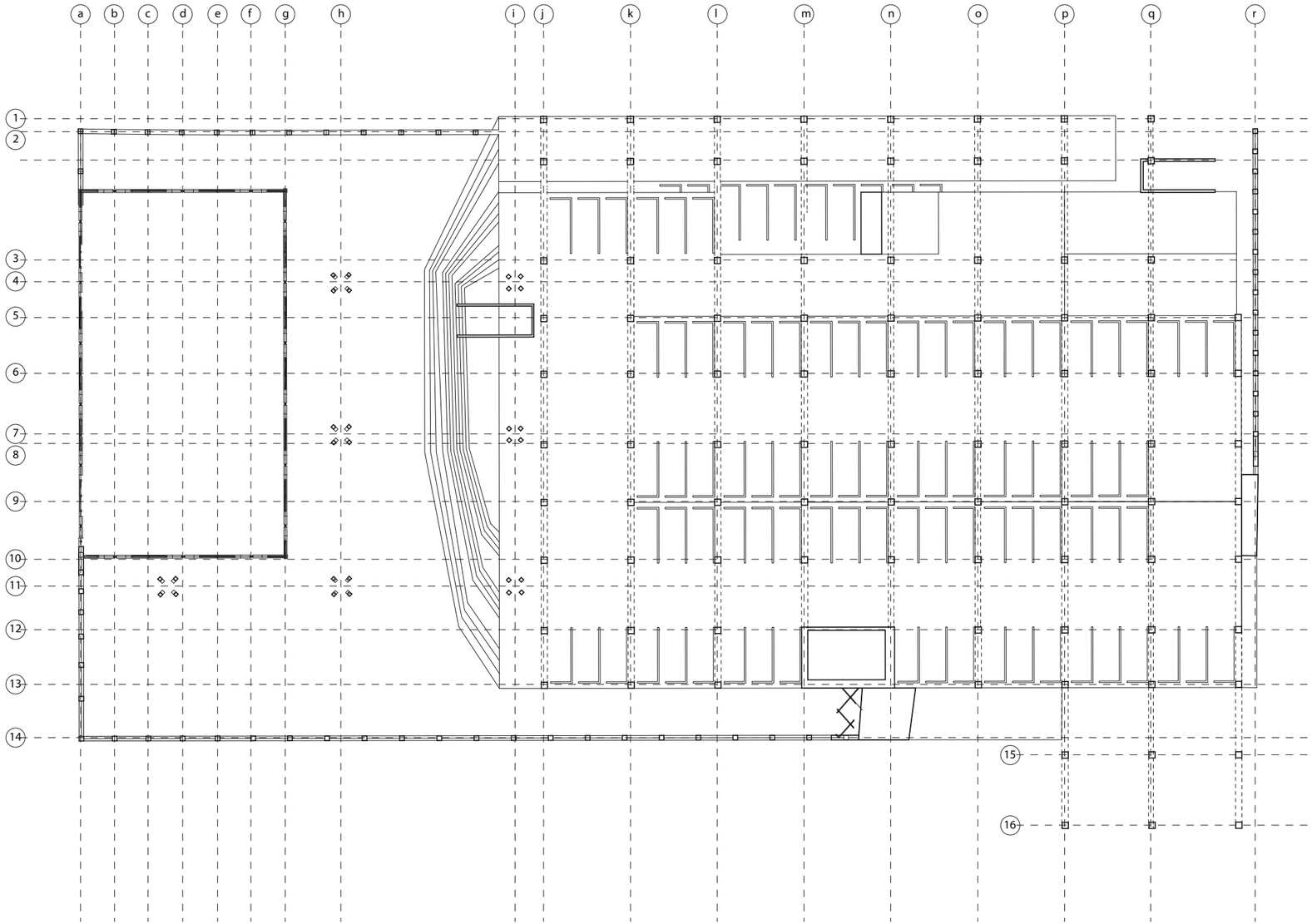
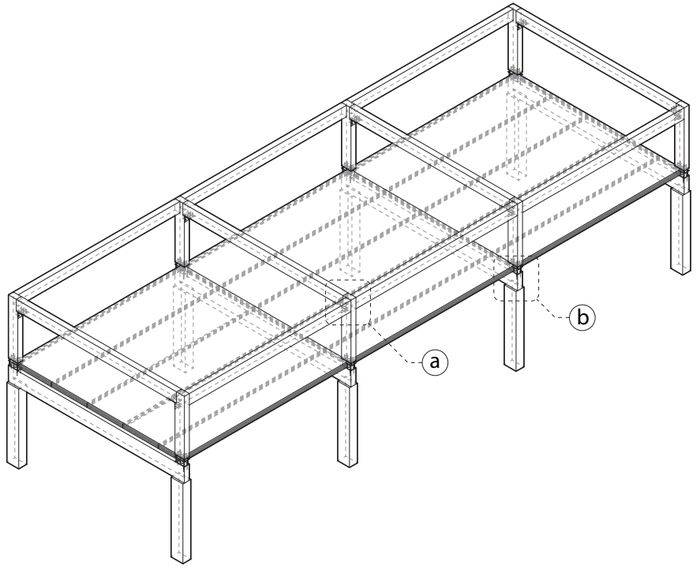


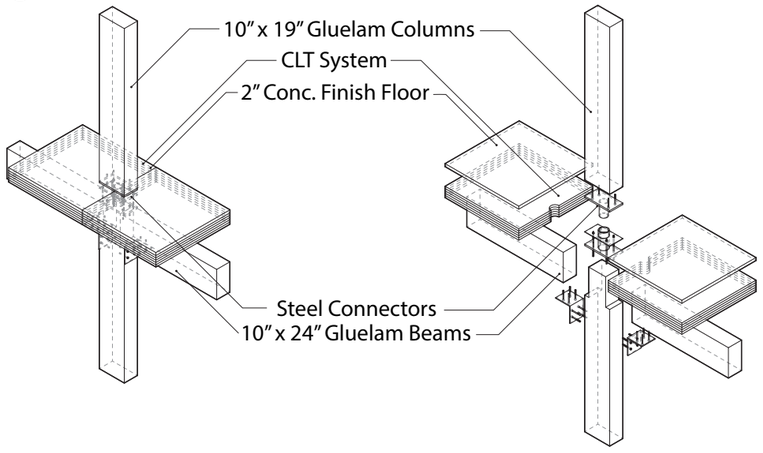
Structural Schematics Summary - Housing



The housing structural system is comprised of a concrete lower floors in accordance with the parking structure and a heavy timber system.
The structure is a two-way system with a primary glue laminated column and beam system with a secondary CLT floor system.

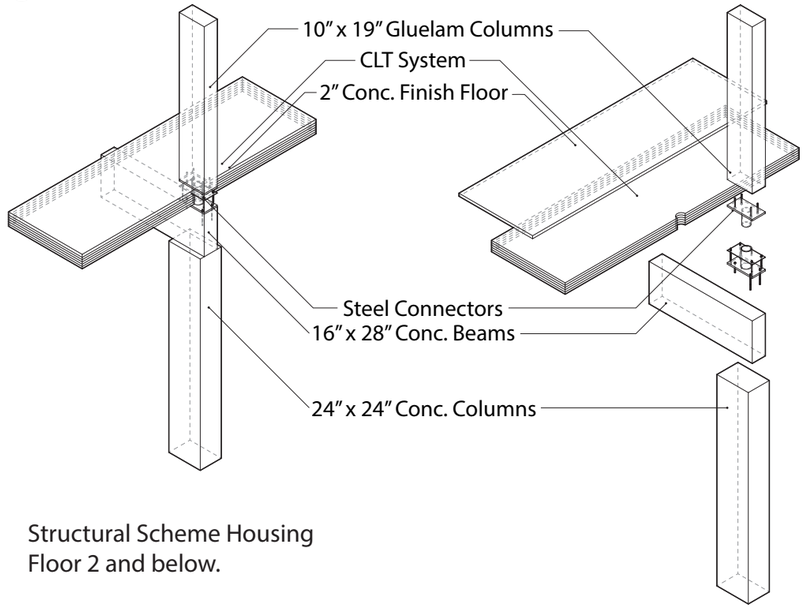
To provide lateral stability to the frame there are CLT shear walls that frame the circulation corridor and divide the unit types.

a



Structural Scheme Housing
Floor three and up.

b



Structural Scheme Housing
Floor 2 and below.

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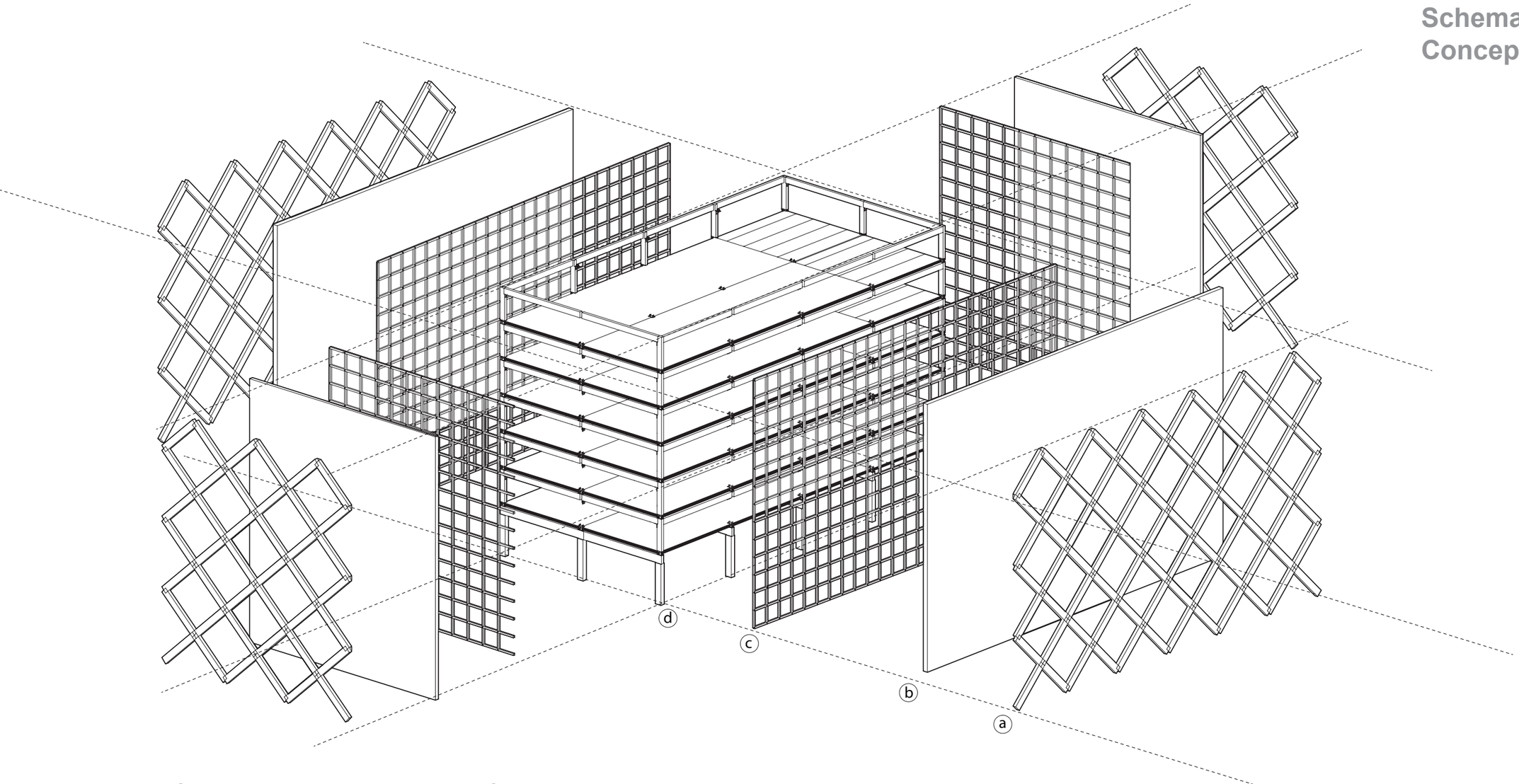
Structural Schematics Summary - Community Center



(a) 12" x 24" Gluelam Diagrid System

(b) Glazing System

(c) 6" x 6" Mullion Frame System

(d) Gluelam Column Grid System and CLT

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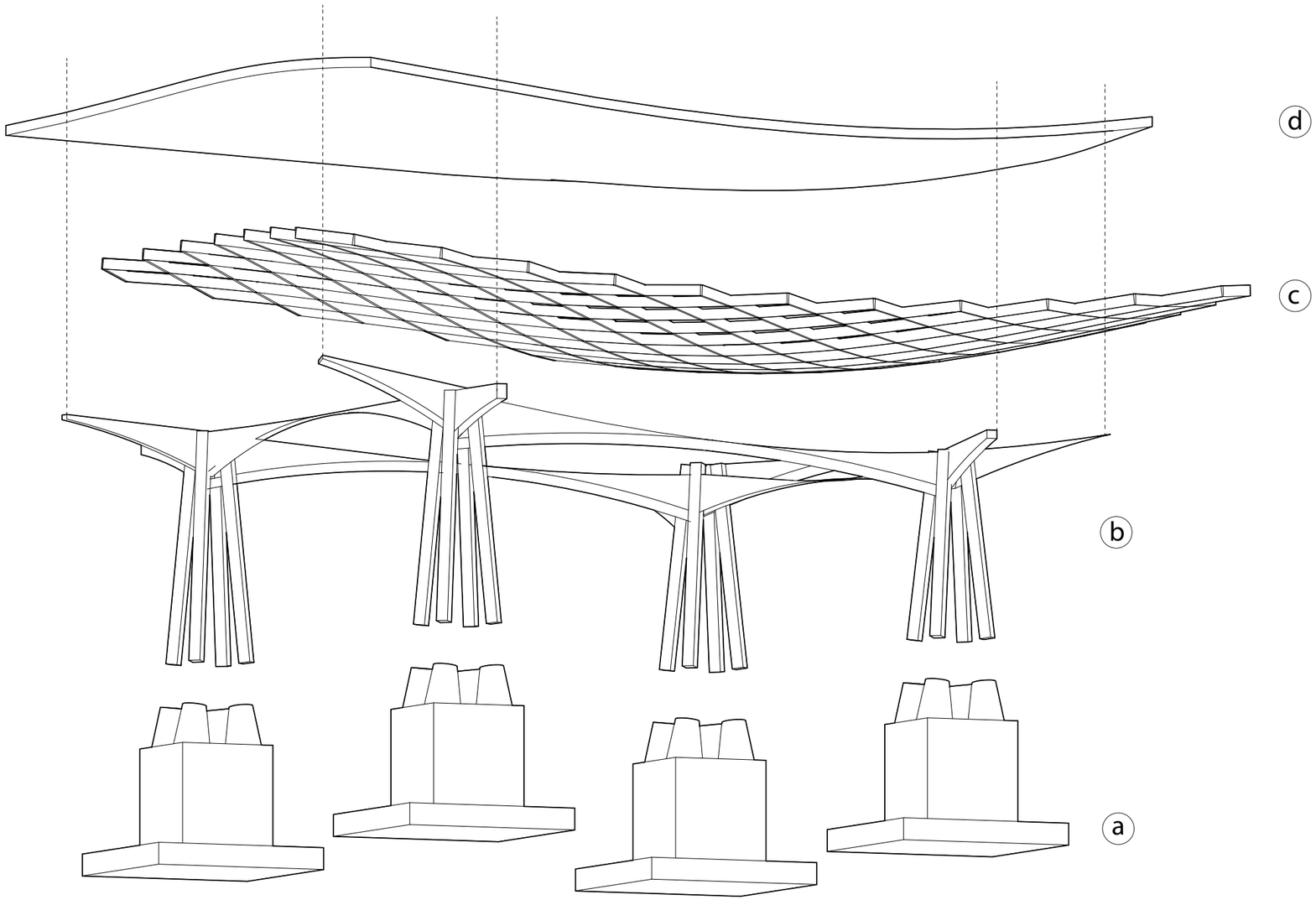

(a) Concrete foundation system

(b) Gluelam column structure

(c1) 2" x 24" Gluelam diagrid

(d) 2" Precast concrete system/wood cladding