

- 7 Ngataringa Road, Devonport, Auckland
- Total Area of Site – 4.04 hectares
- 24 Hotel Bedrooms, 36 Chalet Bedrooms
- Perimeter Moment Resisting Steel Frame
- Total Cost of Hotel Structure - \$21.43M
- Total Project Duration - 459 Days

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Project goals

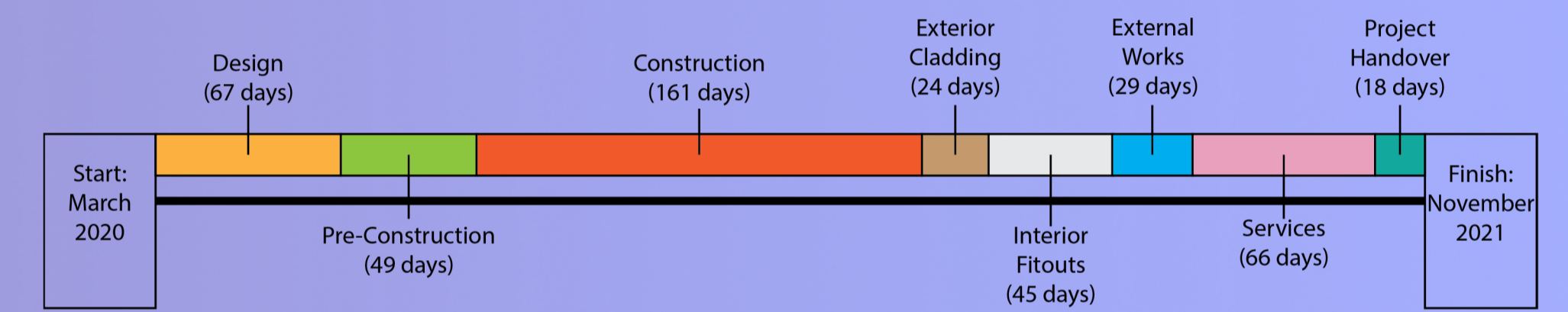
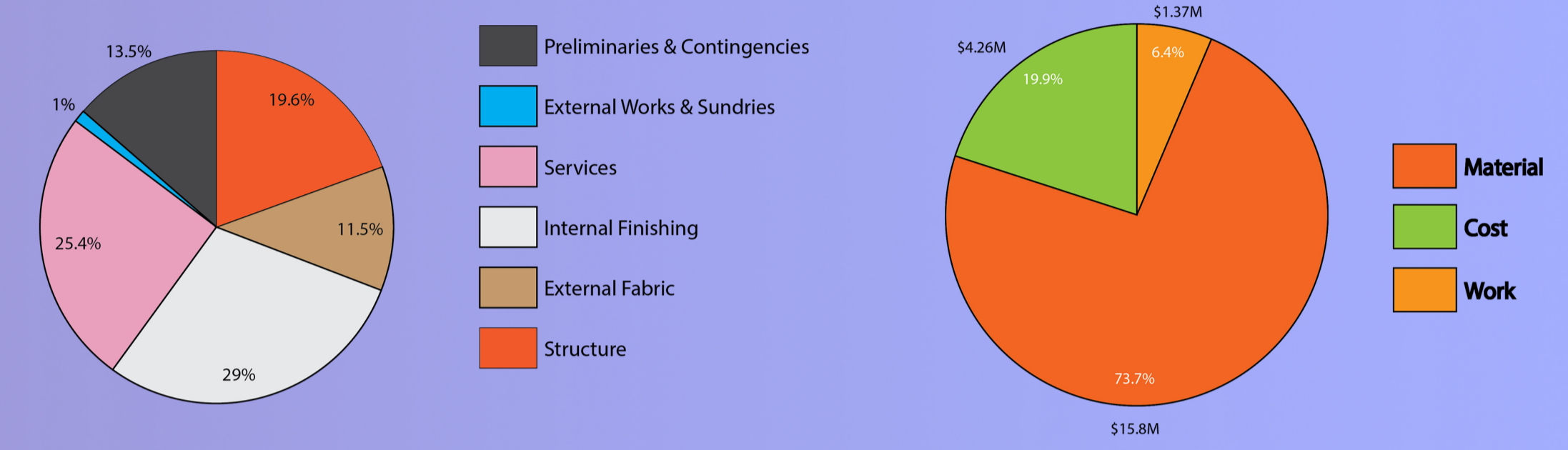
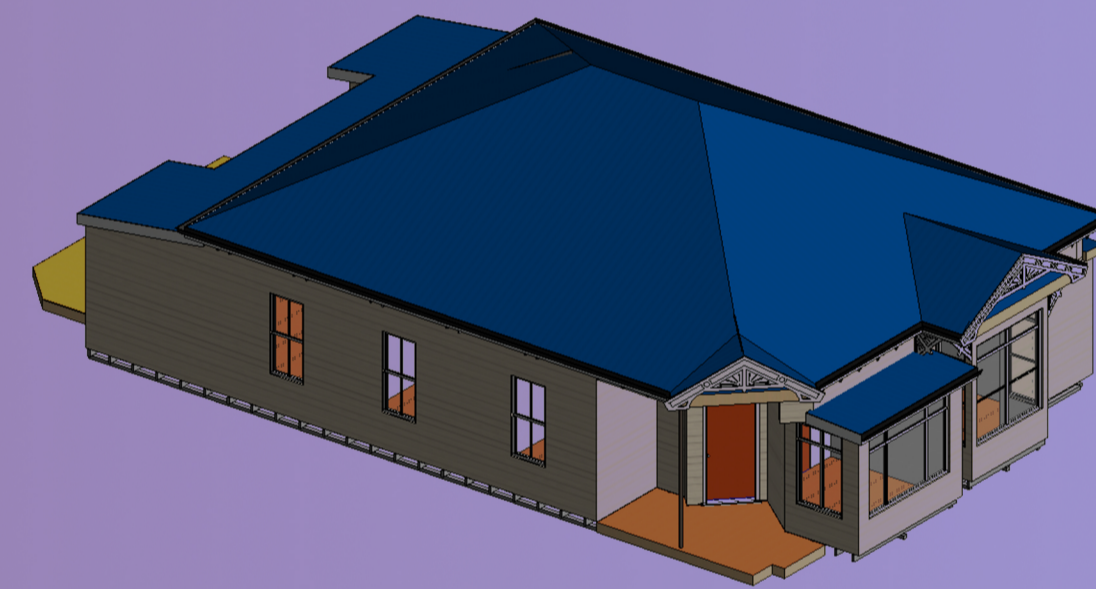
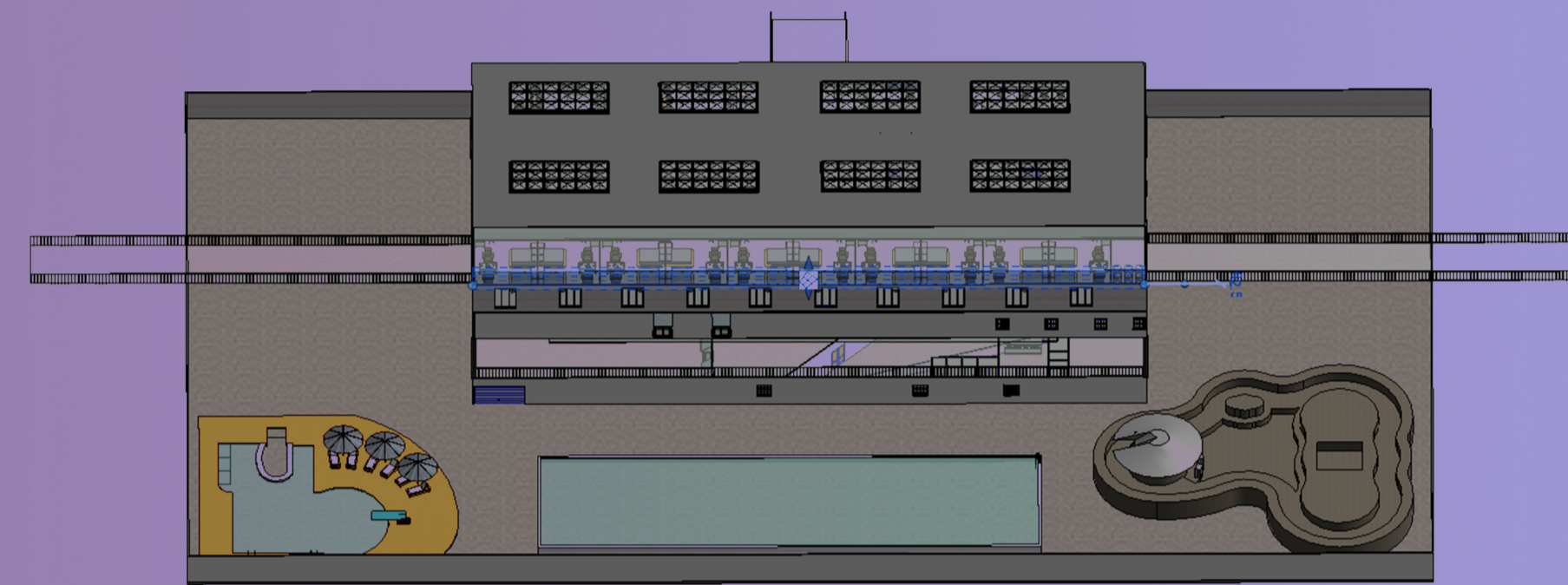
Sustainable and environmentally friendly design

Focus on long term value and life cycle cost and quality

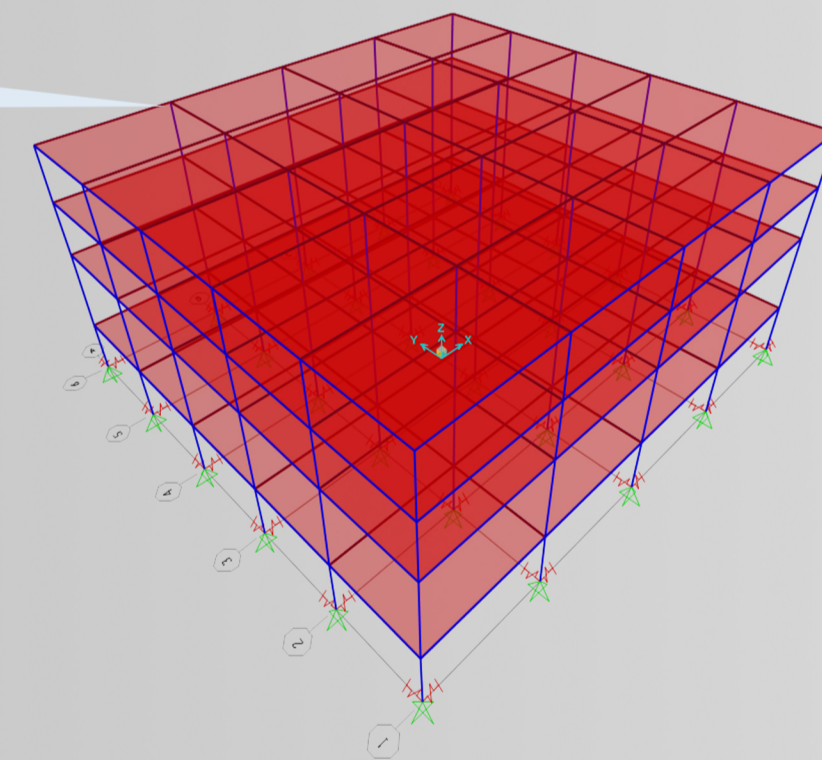
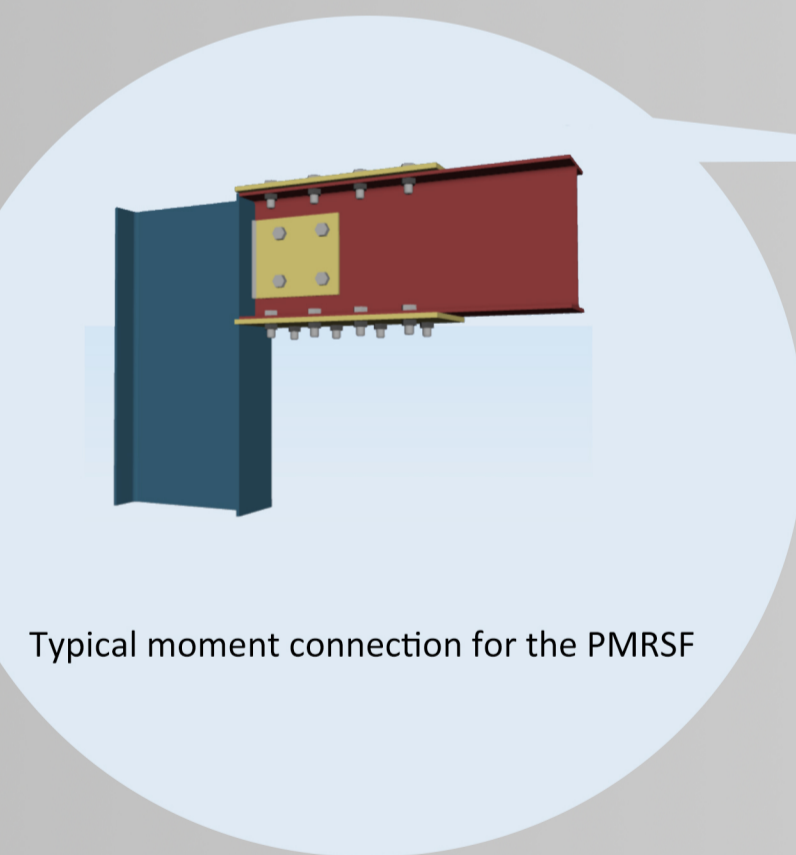
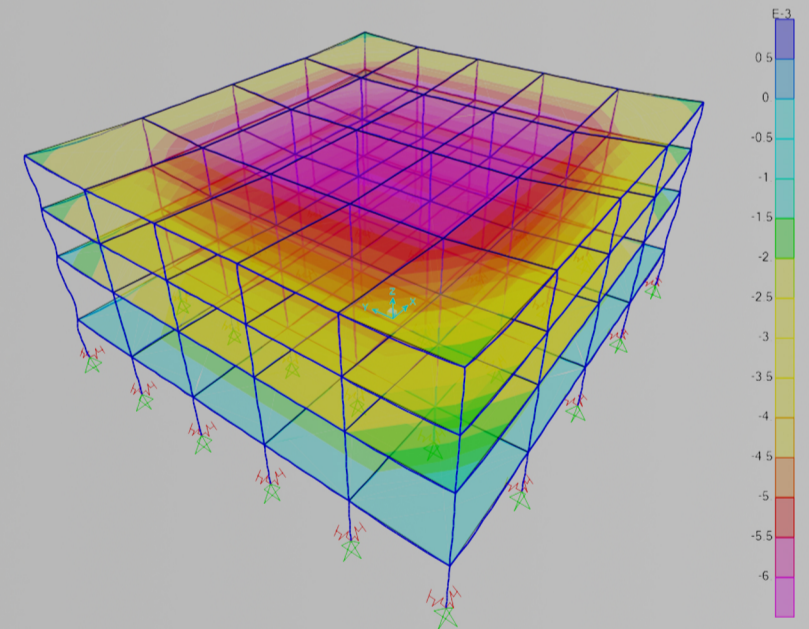
Create a community hub to integrate the surrounding areas

Methodology

Vulcan consultants performed comprehensive research on the site and its history in the context of social and environmental concerns and using this information an initial concept was created and revised multiple times. After this concept was developed our structures team analyzed the structural loads and requirements and designed a steel structural system to meet these requirements. Throughout this process extensive cost analysis, risk analysis, foundational designs and project management plans were prepared in order to properly meet our project goals



Project Planning Timeline - 459 days



- A perimeter moment resisting steel frame (PMRSF) was used as it is more common with multi-storey steel buildings where the system provides lateral strength against earthquake loads due to the rigid connections of the perimeter MRF.
- The PMRSF is a flexible option providing larger open spaces and saving costs due to the use of internal gravity frames with simple connections.
- Rotational springs were defined at the base of all columns to provide information regarding base flexibility and so the behavior of soil with the super-structure.



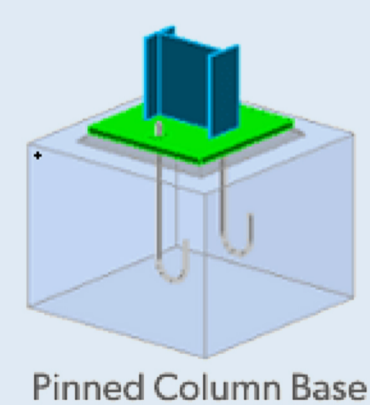
Room type A (Double)



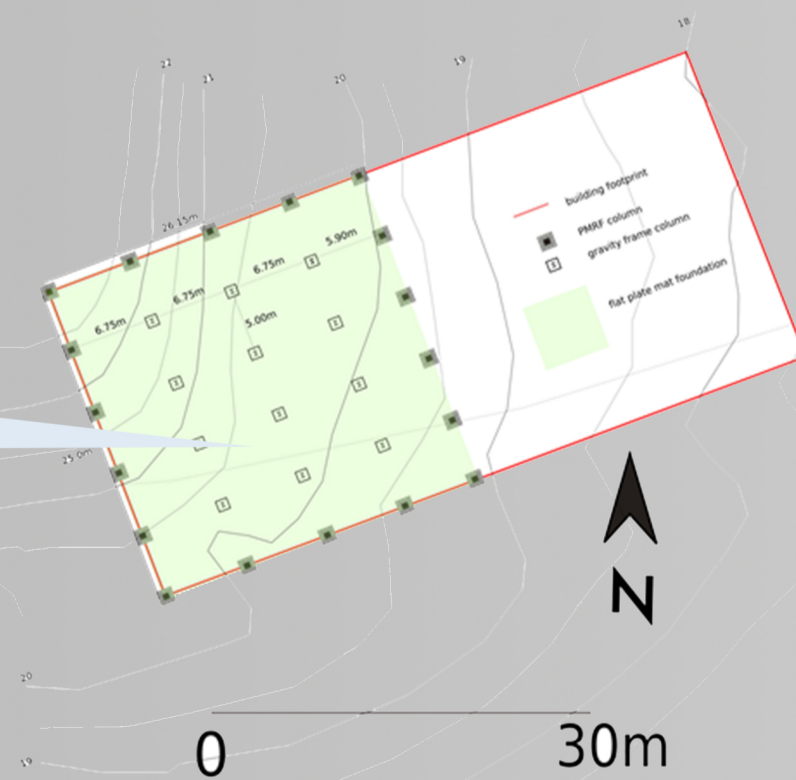
Room Type B (Suite)

Deformed Shape Under 1.2 Normal To Surface

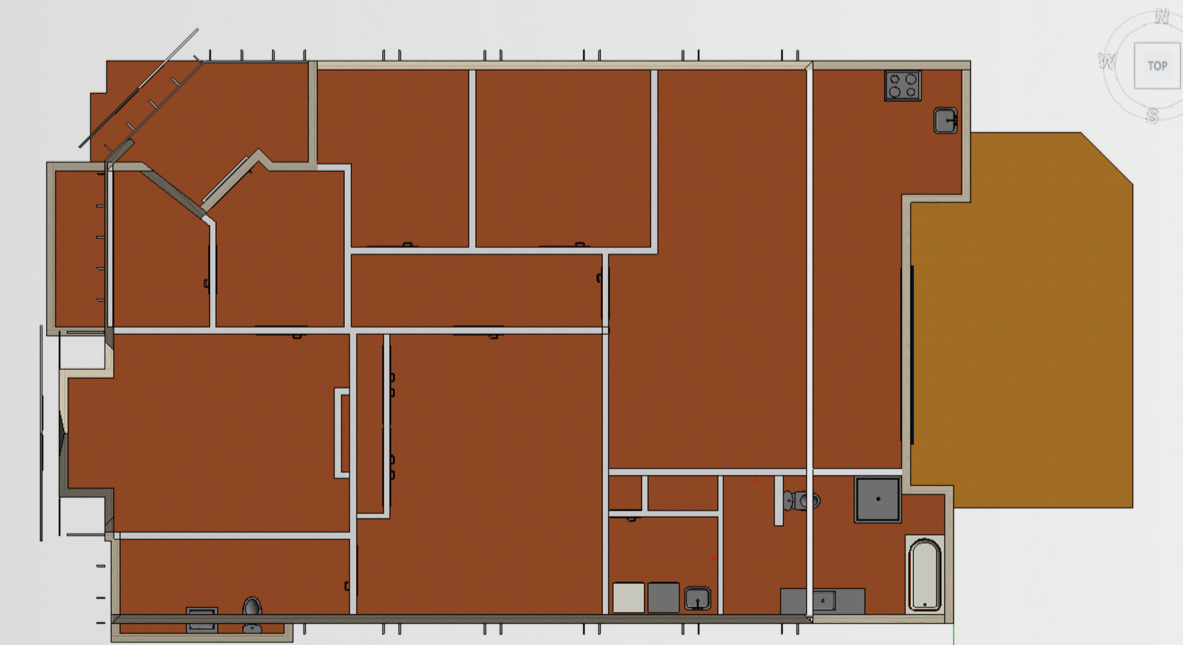
Typical moment connection for the PMRSF



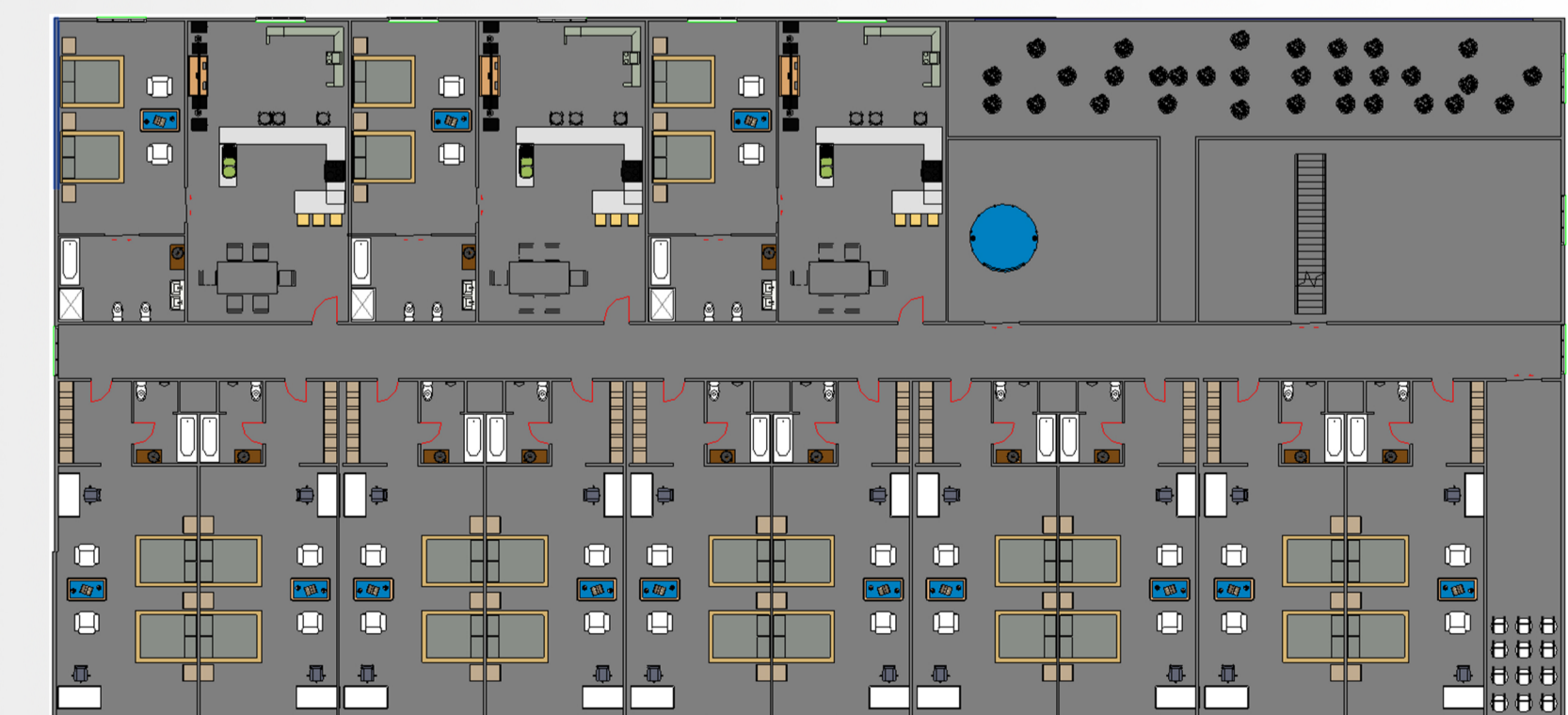
Pinned Column Base



A flat plate mat foundation design is proposed to support the main complex owing to crowding effects of pad foundations and to take advantage of the building's symmetrical partition. The ECBF soils at the extent of the building footprint are more silty sand than clay, though layers of both are consistently found in the geotechnical profile. This mat design is a cost-effective shallow foundation solution to sufficiently spread the large axial loads experienced by the interior gravity frame.



Chalet Basemap



Hotel Room Layout