4. Architectural Breadth

4.1 Existing Building Architecture and Proposed Changes

As stated in the Building Background Section, the architectural taste of American Eagle Outfitters: Quantum III is characteristic of Pittsburgh, and materials imply this sense of place. New materials will be researched and analyzed based on their adequacy for building shell redesign. Quantum III's façade will be reevaluated to fit the scene of the surrounding architecture in Oakland, CA and local materials can be emphasized to give a sense of place.

With the addition of floors, shell architecture changes as a result of scale. Parapets and pedestals may need resized or redesigned based on this. Also, due to the structural requirements of a seismic controlled region, additional lateral resistance frames will be strategically placed within the interior and building shell to limit architectural interference. The preference for frame location is on the building shell. The interior of American Eagle Outfitters: Quantum III is open to allow for tenant fit out. Therefore, the focus of the architectural redesign is in the shell.

Figure 32 – North QIII Façade

4.2 Possible Frame Locations

As outlined in the structural depth, additional lateral frames must be added to American Eagle Outfitters: Quantum III if it is to resist California's seismic demands. The effects of each frame location on building architecture were weighed against the frame's usefulness in lateral strength. Following is the procession of designs considered and the corresponding architectural issues that arose as a result.

Figure 33 – Existing and New Truss Locations

All proposed lateral frame locations do not interfere with the open floor layout of Quantum III. The only possible additional frame location within the building is beside a core area where NT-C is. There are currently no doors accessing this wall of the core, and the only possible interference can be with mechanical systems and ducts.

Note all following building elevations are for the existing AEO: QIII. They are provided to demonstrate where architectural interferences may occur. For the new, increased elevation, all top story elements (such as aluminum paneling around columns) are assumed to transfer to the new QIII's top story.

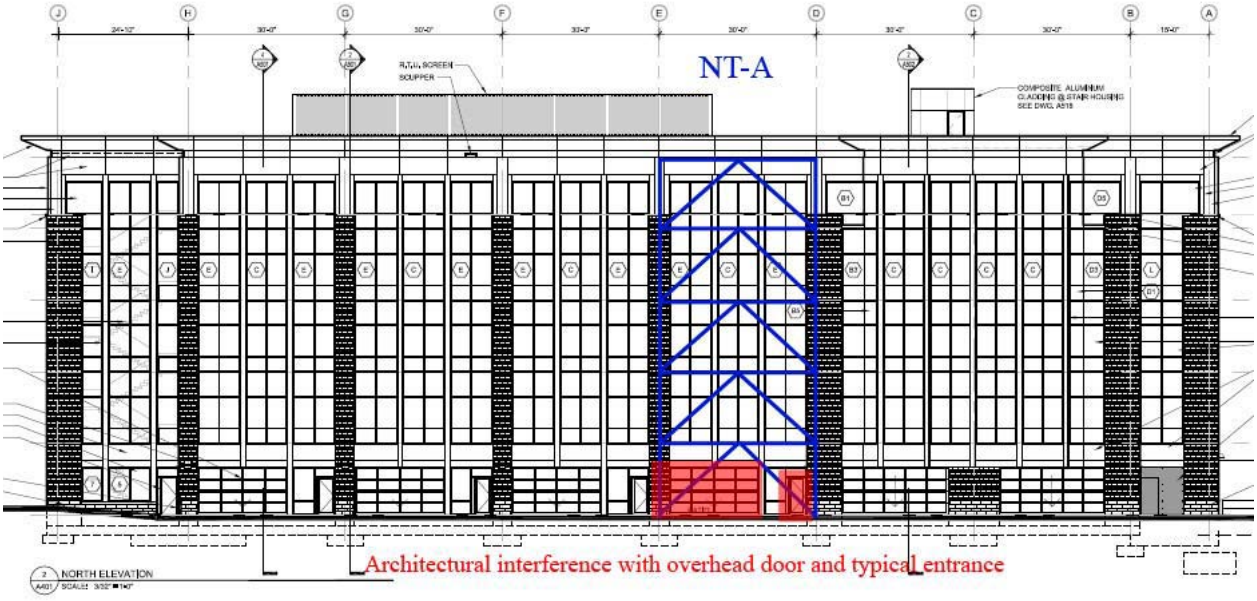

Figure 34 – North Elevation and NT-A

All locations save NT-A have minimal façade interference. As shown above, the base level intersects with an overhead door and windows. A frame at this location would render this door useless and block an entrance. Due to the door being placed on the corner of the bay, even an eccentric frame could not avoid this obstruction. Although it is an excellent display of structure, this is the least desirable location for a new truss. NT-B, D, and E are all located on brick exterior walls so as to avoid curtain wall conflicts. The top story façade is composed of aluminum panels at these locations, so lateral framing will not hinder the transparency of Quantum III.

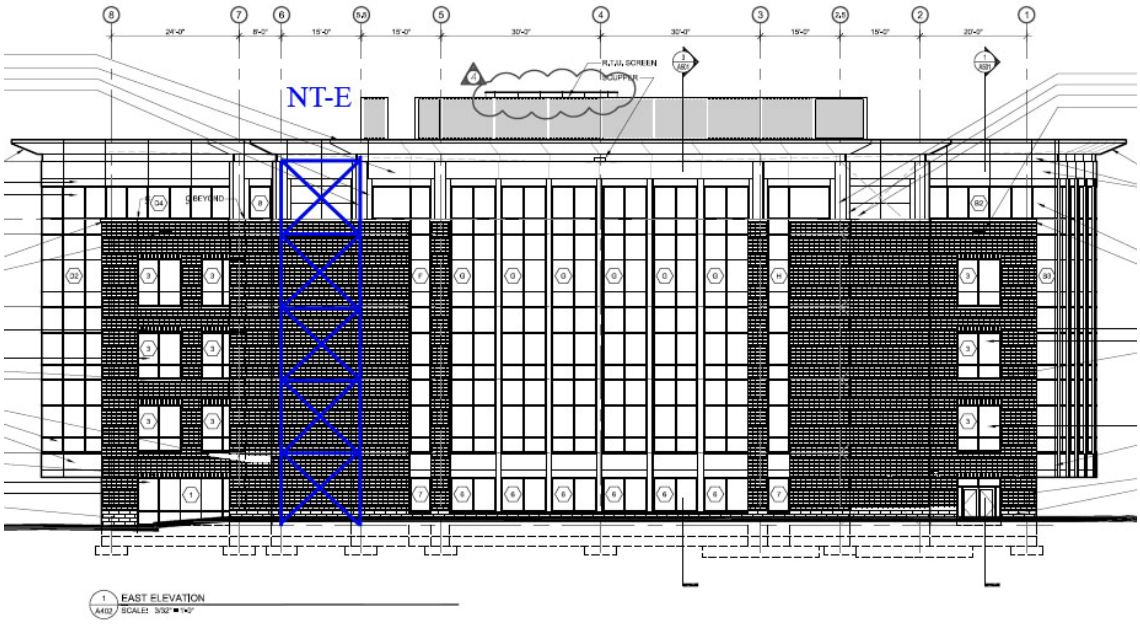

Figure 35- East Elevation and NT-E

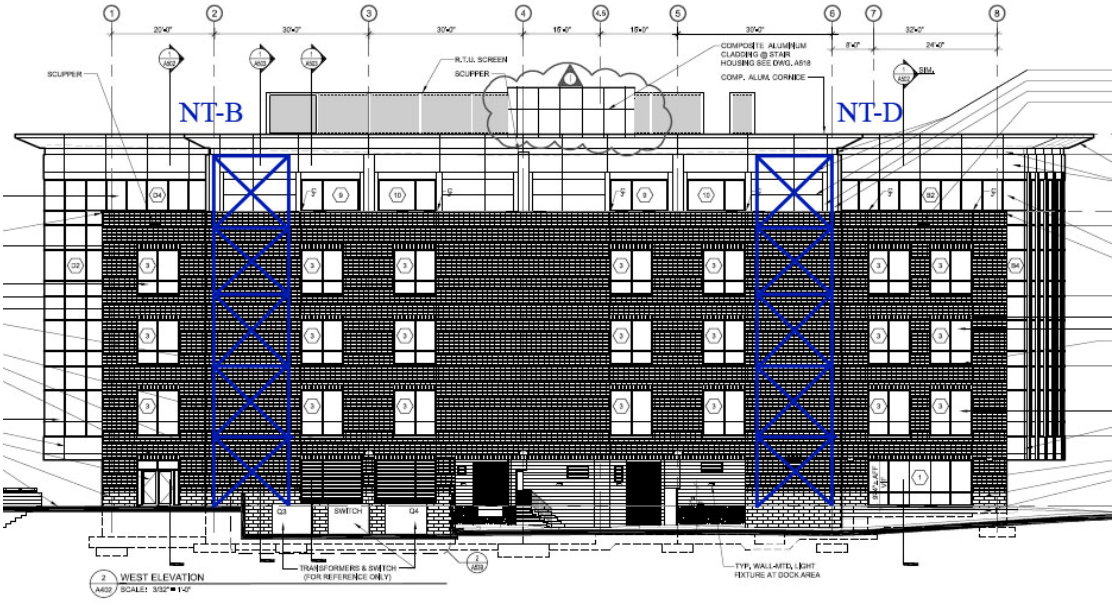

Figure 36 - West Elevation and VT-B and D

As shown in Figure 36 - West Elevation and VT-B and D NT-B and D do not obstruct any architectural features of American Eagle Outfitters: Quantum III. Outlined on the previous page, the façade at the top of the elevation is composed entirely of composite aluminum panels. In effect, no curtain wall systems or windows are blocked by the addition of these frames. Additionally, the two proposed trusses in the above figure appear to be "floating". QIII's ground level is exactly where the blue truss outline ends. Slab on grade is at this plane, so the walls below are a combination of retaining and structural walls.

4.3 Final Frame Layout

As shown at right, the final frame layout utilizes NT-B, D, VT-A, B, D, and E. No more curtain wall facades are obstructed by the new frame layout than in the original American Eagle Outfitters: Quantum III design.

Figure 37 – Final Frame Layout

4.4 Shell Redesign

The shell redesign began with the scaling of vertical and horizontal elements of Quantum III. Originally, the author was going to double the height of the building, keeping it barely below the ASCE 7-05 seismic limit of 160'. It was proposed to have ten stories and a rooftop mechanical level. At this point rescaling of column and massing element widths would have been a typical architectural consideration. However, the final addition of floors to QIII was limited at two. Although this new design is roughly 140 percent of the original building height, massing element rescaling was negligible.

Looking at the new height and scaling analytically, typical interior brick vertical elements would change from 4' to 6'. Preliminary AutoCAD drawings were made to analyze this, and the difference between the two was minute. Therefore, the smaller elements (such as the continuous aluminum panels running up the façade) would change from 1' width to 1'-3.5". This is obviously negligible. Columns in both elevations below are the same width to demonstrate the minor difference in scale of columns and massing elements.

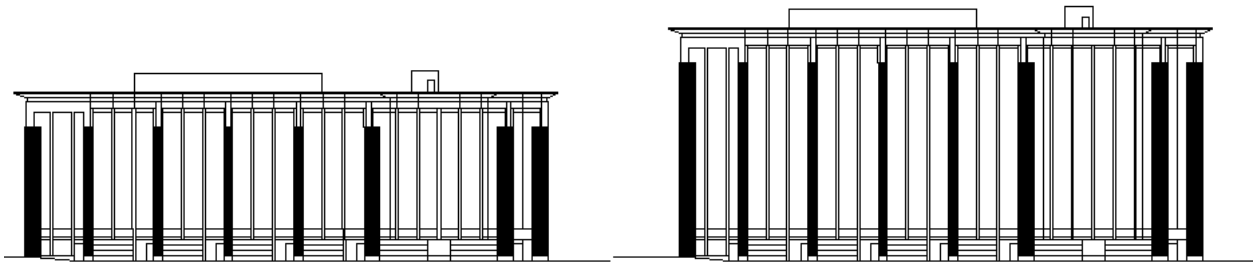

Figure 38 – North Building Elevation for Existing and New Quantum III

Therefore, the scope of the façade redesign only extends to materials and frame location. The location of mass and transparency elements will not change. In other words, the building elevation increases but location of existing elements such as brick walls will still provide mass at their current location.

4.4.1 Oakland Architecture

More so than typical San Francisco and Bay Area architecture, Oakland was defined by the progression of transportation development. Whereas San Francisco was tied by carriage and ship traffic only, the transcontinental railroad had tied Oakland in with the rest of the country, making it a hub of manufacture and development. It was considered the prime suburb of San Francisco and remained ever close to surpassing the city across the bay leading up to the 20th century.

After the 1906 earthquake that destroyed much of San Francisco's residencies and businesses, an influx of people, business, and manufacture moved to Oakland. Oakland had minor damage compared to San Francisco which made it a prime location for the displaced Americans. The influx after the earthquake led to rapid growth and development but it was too

much for the city to accommodate. Consequently, the city could not handle the overload of people and business—most of those that had moved left within two years, leaving an over abundance of newly constructed housing.

Overall, the constant movement of people, both from across the bay and across the country led to the mixed aura of Oakland. Much of the housing constructed after the 1906 earthquake still stands today, and adds to the aura of the city. Also, Oakland's continued expansion of its transportation systems allowed for architectural tastes from all over the country to be left within the city. As Gertrude Stein exclaimed about Oakland: "There's no there there." With hints of California Bungalow, Chicago Prairie School, Classic Revival, English Tudor and recent developments around Lake Merrit, the remark gains ever more bearing on the feel of Oakland. (Winter, 1973, updated 1985)

4.4.2 Façade Assemblies

The current focus is "green" design. It is the tying factor between architects and structural, mechanical, and electrical engineers. From the façade to energy systems to the interior lights, all trades are wrapped into one common goal: energy conservation. This goal will help drive the design of the shell and aid in material selection.

To begin the redesign of the shell, the author researched buildings in Oakland, architecture in Oakland, and factors the climate can have on the building shell. As it turns out, Oakland is in an extreme precipitation zone, where rainfall can exceed 60" per year. To minimize leakage and rain damage in Quantum III, particular caution should be exercised in barrier construction. First, materials must be relatively vapor permeable. Due to the effect of seasons on the building, drying can exist both in and out of the wall; changing the direction of vapor and heat flow. Additionally, interior and exterior side-permeable air barriers are required to limit moisture transport. Where massing elements are present, weather barriers should be installed. This will prevent moisture and precipitation from passing the exterior layers of the shell system. Also, glass and curtain walls should be installed insuring all insulation makes a firm connection to the glass. (Architects, 2007)

The amount of glass in Quantum III's façade adds significant light to the building interior while also increasing cooling requirements. By controlling the amount of sunlight entering the building, certain spectra can be provided to aid in office tasks while limiting the radiation transfer. This can be done to achieve an architecturally and visually appealing façade. Glass panes can be glazed to match the tones of the building while achieving energy efficiency.

Another factor to consider in wall assemblies is the systems resistance to racking. Connections should be designed to withstand seismic accelerations and windows should be designed to withstand shattering as well. This is especially important in high seismic probability zones.

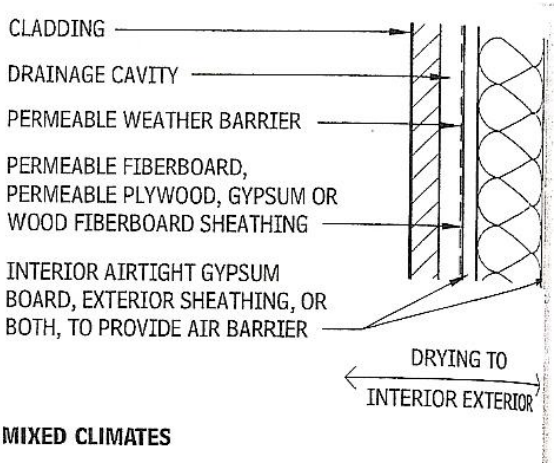

Figure 39 – Mixed Climate Wall Assembly (Architects, 2007)

4.4.3 Façade Redesign

The façade will achieve the feel of a modern high rise while uniting the city of Oakland with the water it borders. Blue toned glass will be coupled with aluminum paneling to invoke balance between buildings such as Oakland City Center (Eric Mueller AE Senior Thesis 2007) and the bay. The rendering below emphasizes the north façade of American Eagle Outfitters: Quantum III.

Figure 40 – North Façade Rendering