

EXECUTIVE SUMMARY

This report will analyze three analysis topics and one critical industry research topic. The construction challenges for Block 12 will be identified, along with potential solutions. The potential solutions will further be examined along with the architectural and mechanical breadths. The architectural breadth involves analyzing the benefits of changing the stone veneer to EIFS, while the mechanical breadth involves analyzing the benefits of a sensible wheel for the retail level.

Block 12 is part of a new community development in the heart of Rockville, MD. The developer, Federal Realty Investment Trust, will own, operate, and manage the newly constructed building, which is intended to achieve LEED certified status. Within the structure's four total floors and two sublevels, various usage types will be incorporated. A parking garage will provide 163 spaces over 72,266 square feet spanning over 2 levels. In various locations across two levels, retail space will occupy 44,254 square feet and consist of 13 individual retail spaces. The residential space makes up 175,284 square feet of the building and includes 174 units, a fitness center for the tenants, and an outdoor courtyard with a swimming pool.

The existing conditions of Block 12 are ideal. Block 12 sits at on a large open commercial lot. Existing stores include Starbucks, Bank of America, AC Moor, Chipotle, and Bally Total Fitness among others. As part of phase 1 of the overall project, Bally Total Fitness will be under demolition. The existing building does not affect Block 12's construction progress, but it does affect Block 10 and 11, which are the other 2 buildings being built adjacent. Utilities are readily accessible, but due to the high occupancy demands of the overall project, most of the utilities will have to be upsized. Construction traffic flow is of a concern due to the high car flow and accessibility issues on the two primary roads. Based on the geotechnical reports, Block 12 sits above 3 feet of the water level, facilitated with the drainage concerns during excavation.

The project schedule has a critical finish date of May 2014. Federal Realty Investment Trust plans on leasing the apartments to recent college graduates, who are seeking a place to live after having accepted a job near the densely populated DC/Northern Virginia Area. The project is fast paced, with a construction schedule lasting only 20 months. This was achieved through prefabricating wood framing into sections. The production rate was increased by systematically managing workflow and through effectively splitting the building into four sections as seen on Figure E.S.1. The project had a 5 day delay due to Hurricane Sandy hitting the job site. The effect was mitigated by proactively planning accumulated water deposits within the excavation. The only activity in the schedule that lies on the critical path is close-out, which also marks the period of most workforce demand.

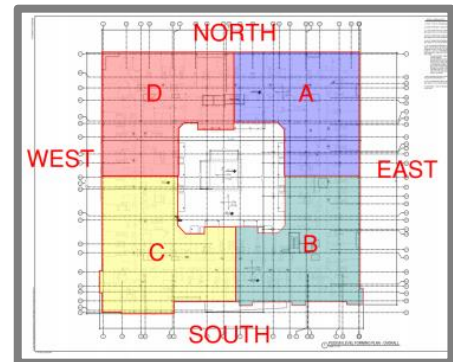


Figure E.S.1: Wood framing sequence

The wood frame building sits on spread footing set 3 feet below the slab on grade level with two post tensioned concrete slabs. The cast-in-place concrete was pumped and poured using concrete barrels, to reach the building's extremes. The residential units will be heated by split system heat pumps and cooled with a cooling system. The mechanical equipment will primarily be located on the roof, including 2 RTU's. The parking garage will circulate air with 3

exhaust fans, which will be activated with CO₂ sensors. Active fire protection measures are taken by 2hr fire rated shafts and fire rated I-beams. Passive fire protection measures are additionally taken by a wet pipe system in the stairs & residential areas and a dry pipe system in the garage & retail slabs. The electrical system is a 3 phase 480/277V low voltage fed from one location to electrical closets on each level. The building will contain 1 diesel 250 KW generator for emergency power outages with an auto start specification of 10 seconds max and minimum fuel storage of 24 hours at rated load. Load bearing concrete masonry walls will house the stair shafts. The exterior retail space façade will primarily be composed of curtain walls, to be designed, furnished, and installed by the subcontractor. The systems to support excavation walls were steel soldier piles and wood lagging boards with tiebacks on the north, south, and east. The west side was laid back to facilitate truck flow traffic inside the excavation. Temporary pumps were used only used during excavation, due to the building sitting on 3 feet above the water line.

The patented system by SCA Consulting Engineers, Inc. was incorporated for faster production time installing drywall. Full sheets of drywall can be placed and drilled in place, compared to traditionally trimming the drywall to fit properly. Zip system sheathing and tape was used as a moisture resistant barrier to enclose the building and reduce air leakage. This system discards the need for house wrap and felt typically required. The owner is seeking LEED Accreditation through implementing a green roof, a waste management plan, and an indoor air quality management plan.

The project delivery system is a traditional Design-Bid-Build project delivery system with the CM at risk providing a GMP. This was the chosen method due to the owner feeling comfortable with the delivery method and by previous project's success. The owner settled on a price with the construction manager, The Whiting-Turner Construction Company, through a negotiation. The owner's representative is compensated through a cost by fee basis, while the architects, engineers, and subcontractor's contract types are lump sums. It is worth noting, even though the architect and construction manager do not have a contract, they have a strong communication for the success of this project. The construction contract terms are typical AIA language stating explicitly each party's responsibilities. The schedule to abide is attached and the consequences for delay or non-compliance are stated. The contractor was selected based on a good relationship with the owner.

Block 12 is one of three buildings under construction at the same time, with a team dedicated to site work, due to the heavy site work involvement. Ted Border is the Vice President overseeing all the work performed throughout the overall project. Adam Haubert is the Sr. Project Manager primarily in charge of scheduling. Luther Hildreth is the Senior Superintendent making sure everything runs smoothly in the field. Site work and Block 12 are structured similarly with a project engineer being under a superintendent under a project manager.

Federal Realty Investment Trust is a large realty investment trust, which focuses on development and redevelopment. They typically own, operate, and manage their buildings. Federal Realty is a privately funded company who focuses on obtaining a quality building at a feasible cost.