Illinois Structural Masonry Coalition

Ninety 7 Fifty On The Park

NINETY 7 FIFTY ON THE PARK
Orland Park, Illinois

ARCHITECT
RTKL Associates Inc.

STRUCTURAL ENGINEER
Samartano & Company

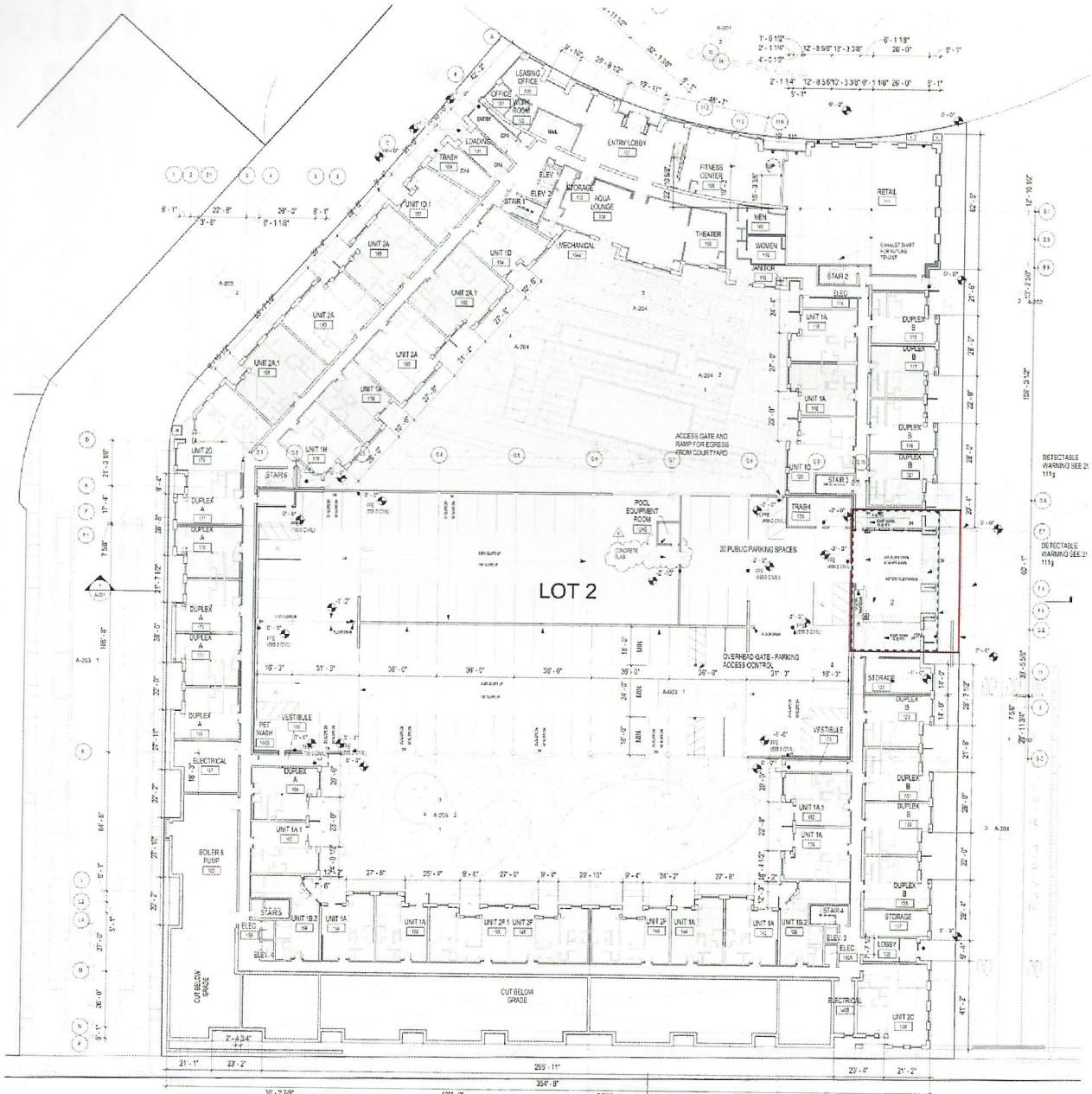
GENERAL CONTRACTOR
James McHugh Construction Co.

MASON CONTRACTOR
J. & E. Duff Inc.

Introduction:

The Village of Orland Park and renowned Midwest multifamily developer Flaherty & Collins Properties are committed to excellence. They united to create a link between the past and the present of the village while developing a new downtown area. McHugh Construction brought their masonry knowledge to the table to save the project 4 million dollars in construction!

www.maconline.org 847-297-6704



Above: Floor Plan and Below: North Elevation

2 NORTH ELEVATION - CRESCENT

The first phase of the Orland Park, IL downtown project is the multifamily Ninety 7 Fifty on the Park with 178 one bedroom apartments and 117 two bedroom apartments for a total of 295 total units. The total floor area for the multifamily building is 486,445 ft^2. Located near the Metra station and major highways this development is slotted to bring in population to the new downtown.

"The System", load bearing concrete masonry with hollow core precast planks provides a fast, efficient, and cost effective building solution for multifamily residences. Ninety7Fifty on the Park in Orland Park, Illinois was a great success story for "The System". These days' general contractors are often brought into the building planning process before architects and act as the owner's advisors for cost savings during construction. General contractors align themselves with different structural systems that have worked in the past for jobs.

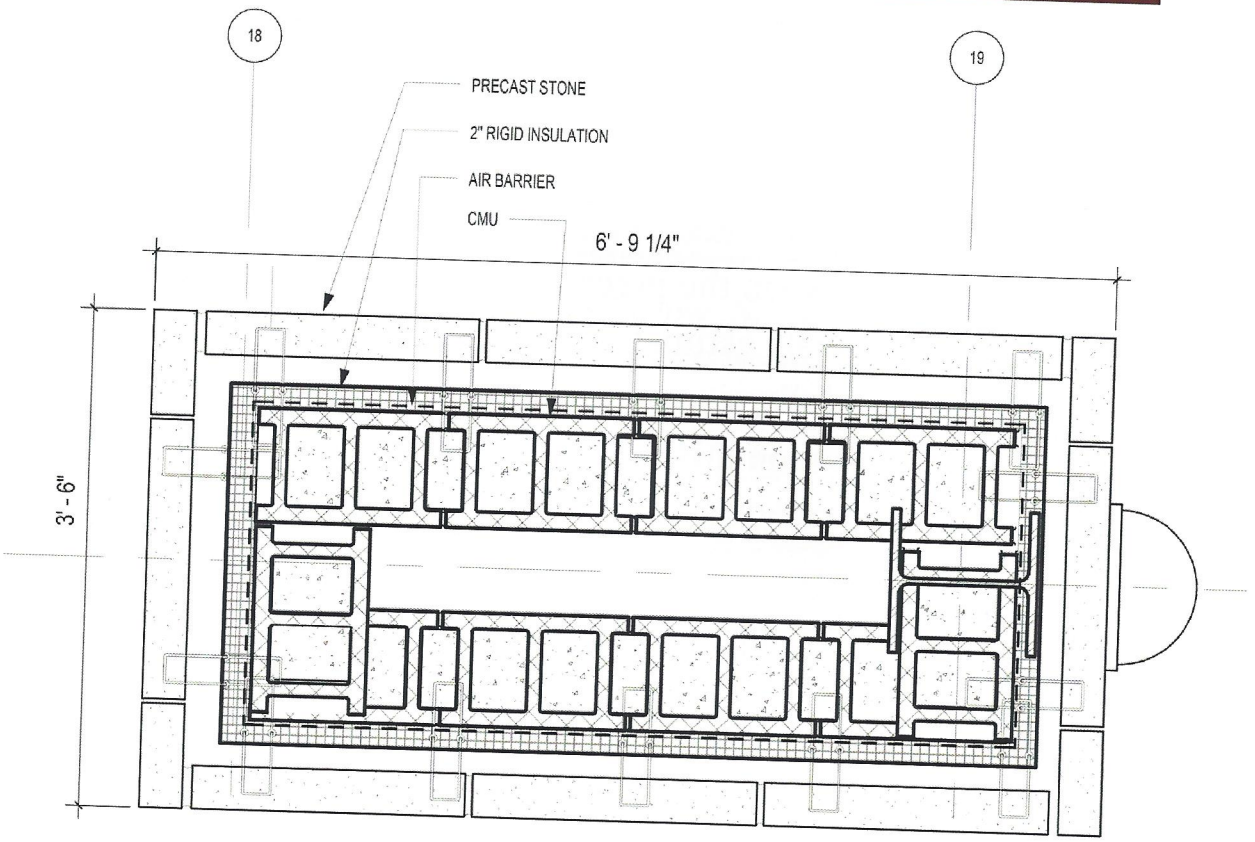
At Ninety7Fifty on the Park two general contractors were brought in before McHugh, and each brought with them their preferred structural system. One brought structural steel and another brought precast panels. The final choice for the structural system was load bearing concrete masonry with hollow core precast planks based largely on cost savings versus steel and precast structural systems. The Illinois Structural Masonry Coalition commissioned two independent estimators to analyze the cost comparisons between the precast panels and masonry construction. Their separate estimates both showed masonry savings upwards of $4,000,000 dollars.

Masonry was shown on this job to shorten the schedule and save time. Masonry does not require prefabrication, and masons can be on a job with a week's notice constructing on a foundation. McHugh chose the structural system to be masonry construction because buildings up to six stories tall can be efficiently constructed for the best cost. Another reason that masonry was chosen over precast was the varying heights

and openings in the exterior were difficult to manufacture. Masonry provided the architect with more avenues for creativity in design.

The concrete masonry units were specified in the structural plans to be 4500 psi ASTM C-90 block, Type S Portland cement/lime mortar for load bearing applications and 2500 psi for minimum for the grout. These increases to the individual components in the wall assembly allowed the structural engineer to feel comfortable specifying 2500 psi for the compressive strength of the masonry assemblage, f'_m. A one foot length of wall with 10" grouted cells using 2500 psi compressive strength will support 300,000 lbs at the very least.

Below: CMU pier between large openings in between garage doors



CONTRACTOR'S CORNER

Richard Lauber the owner of J. & E. Duff said "This was a good job because it was structural masonry. It was nice to see that the general contractor was impressed with the ability of masonry to meet and exceed the schedule. The job went up very fast, and we had to wait for the precast planks at the floors levels because we were moving faster than the schedule. It was also nice for us to be responsible for the veneer and the back up because there was no waiting for the steel and the sheathing to go up. There were approximately 245,000 pieces of CMU, 13,500 cubic feet of cast stone and 118,000 utility brick used on this job".

ORLAND PARK MASONRY ORDINANCE

In the early 20th century, Orland Park first began to experience residential development with brick construction in the form of housing that incorporated Tudor, Revival, Four Square and Bungalow architectural styles and accents. The design styles incorporating clay brick were identified as desirable by the community because of the visual appeal, durability and safety brick construction provided. As population increased, the Village officials adopted various fire safety measures to deal with the population growth.

In 1966, Orland Park adopted its first set of masonry standards for new construction by adding language into the building code that required all new commercial and industrial buildings to be constructed of brick, stone or other non-combustible materials. Over the years, Orland Park's masonry standards in the building code have evolved, currently, the Village's architectural design standards require face brick or stone on not less than fifty (50) percent of exterior walls and face brick or stone on ninety (90) percent of each first floor elevation or ground levels of all residential dwellings. All materials for the remaining ground level wall surfaces have to be approved by the

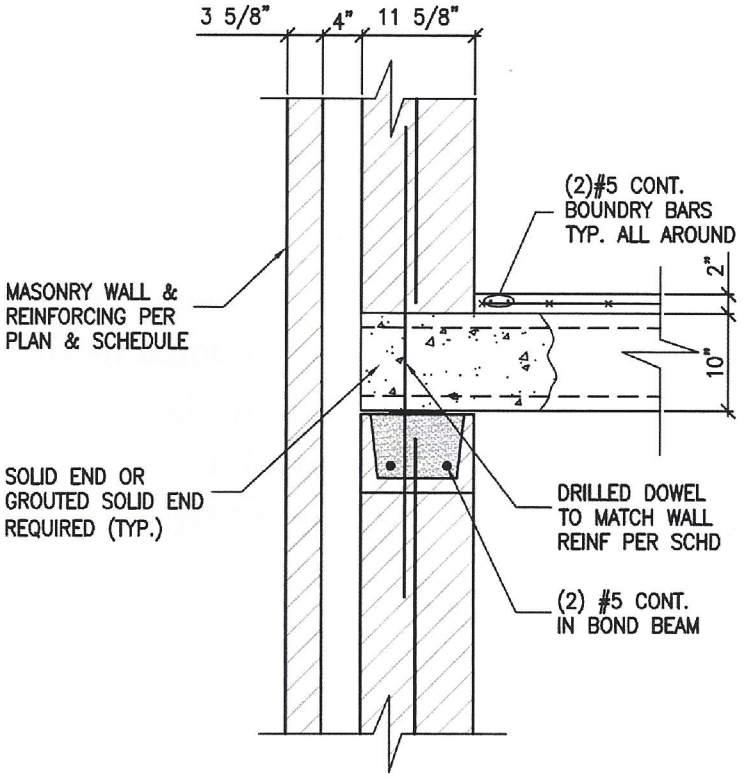
Building Director. Brick or other masonry materials are required on all sides of nonresidential development.

The encouragement for predominance of masonry on new development continues to support Orland Park's long range planning goals of maintaining the value of housing within their neighborhoods. The use of masonry also supports the community's goal of supporting building materials on new development that conserve energy and also encourage the character the Village wishes to preserve within their built environment.

Time lapse of construction

https://www.youtube.com/watch?v=nnSyuzOe57k

Right: Structural detail of load bearing 12" CMU with supporting hollow core precast planks with a brick veneer



7 DETAIL

3/4" = 1'-0

MASONRY WALL SCHEDULE

TYPE	EXTERIOR BRG. WALL	EXTERIOR BRG. WALL	EXTERIOR BRG. WALL	INTERIOR BRG. WALL	INTERIOR BRG. WALL	INTERIOR BRG. WALL	STAIR/ELEVATOR CORE WALL	SHEAR WALL	EXTERIOR WALL	INTERIOR WALL	INTERIOR WALL	MISC. WALL NOT NOTED ON PLAN
MARK	(1)(1A)	(2)(2A)	(3)(3A)	(4)	(5)(5A)	(6)	(7)(7A)	(8)	(9)	(10)	(11)	
HIGH ROOF			8" HOLLOW CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.									
6TH LEVEL					(5A) 8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	8" HOLLOW CMU #5 @ 24" O.C. CTRD IN CMU.				8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	
5TH LEVEL		8" HOLLOW CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.	10" GROUTED SOLID CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.		(5) 8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	10" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	(7A) 8" HOLLOW CMU #5 @ 24" O.C. CTRD IN CMU.		8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	10" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.	
4TH LEVEL	8" HOLLOW CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.	8" SOLID CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.		8" HOLLOW CMU #5 @ 48" O.C. CTRD IN CMU.								
3RD LEVEL												
2ND LEVEL												
GROUND LEVEL	10" GROUTED SOLID CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.	10" GROUTED SOLID CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.	12" GROUTED SOLID CMU + AIR SPACE, INSUL & 4" NOM. VENEER PER ARCH. #5 @ 48" O.C. CTRD IN CMU.	10" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.	10" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.	12" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.	8" GROUTED SOLID CMU #5 @ 24" O.C. CTRD IN CMU.	6" GROUTED SOLID CMU #5 @ 24" O.C. CTRD IN CMU.	8" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.	8" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.	10" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.	8" GROUTED SOLID CMU #5 @ 48" O.C. CTRD IN CMU.
REMARKS	(1A) –NO VENEER	(2A) –NO VENEER	(3A) – VENEER TO 3RD FLOOR ● NORTH ONLY									SEE PLANS FOR LOCATIONS & EXTENTS

MASONRY NOTES:

PROVIDE FULL MORTAR BED (FMB) FOR ALL MASONRY WALLS

CONTINUE REINFORCING IN SCHEDULE UP THROUGH PARAPETS.

SEE DETAILS ON THIS SHEET FOR ADDITIONAL MASONRY REINFORCING.

PROVIDE DOWELS TO CONCRETE TO MATCH WALL REINFORCING.

PROVIDE ADDITIONAL (1)#5 VERTICAL BAR AT EACH SIDE OF OPENINGS UP TO 3'-0" WIDE, PLACED 16" MAX. FROM EDGE OF OPENING .
PROVIDE ADDITIONAL (2)#5 VERTICAL BARS EACH SIDE OF OPENINGS GREATER THAN 3'-0"WIDE, PLACED 16" MAX. FROM EDGE OF OPENING (TYP. U.N.O.)
PROVIDE ADDITIONAL (1)#5 VERTICAL BAR AT EACH MASONRY WALL END, PLACED 8" MAX. FROM END OF WALL. THIS IS APPLICABLE EACH SIDE OF MOVEMENT JOINTS.

ALL VERTICAL BARS TO BE GROUTED SOLID IN CMU CORES.

PROVIDE 9 GAGE, 2-WIRE, TRUSS TYPE GALVANIZED JOINT REINFORCING VERTICALLY AT 16" O.C., MAX. SEE ARCH DRAWINGS AND SPECS FOR COORDINATION WITH VENEER ANCHORAGE.
PROVIDE JOINT REINFORCING WITHIN FIRST TWO BED JOINTS ABOVE AND BELOW ALL WALL OPENINGS AND EXTEND MINIMUM 24" PAST THE EDGE OF SUCH OPENINGS.
PROVIDE JOINT REINFORCING WITHIN 8" OF THE TOP OF ALL WALLS.

'SOLID CMU' MAY BE SOLID GROUTED HOLLOW UNITS OR MINIMUM 76% SOLID UNITS.

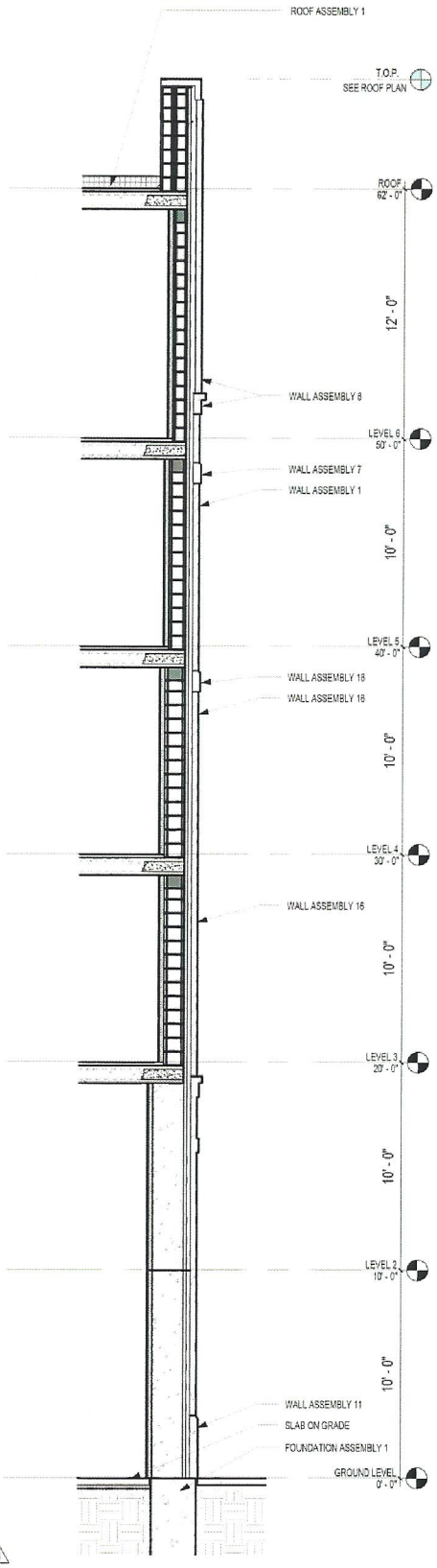
SEE 1/8" PLANS FOR LOCATIONS OF MASONRY PIERS.

ALL VERTICAL OR HORIZONTAL DEFORMED REINFORCING IS TO BE LAPPED A MINIMUM OF 40 BAR DIAMETERS WHERE LAPS ARE REQUIRED.

ALL NON-BEARING MASONRY WALLS TO BE REINFORCED WITH #4@48", MAX. PLUS 1 ADDITIONAL BAR AT ALL CORNERS, ENDS AND OPENINGS. PROVIDE 9 GA. JOINT REINFORCING AT 16", MAX.

GROUT ALL BELOW GRADE CMU CORES SOLID.

Masonry wall schedule and general notes



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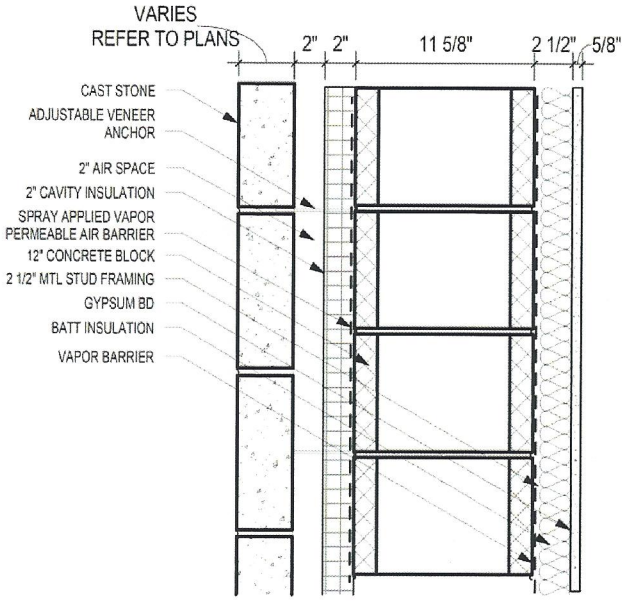
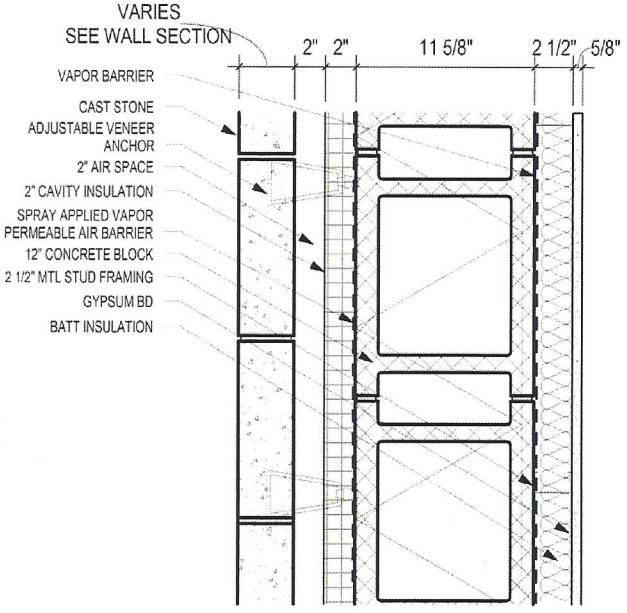
CRESCENT 1

1/4" = 1'-0"



SECTION



PLAN

4

3

WALL ASSEMBLY 18 CAST STONE

1 1/2" = 1'-0"

WALL R-VALUE = R 19.59

Right: Wall assembly plan and section view

Left: Wall cross-section