

NAPHC2016

September 22, 2016

Affordable Multifamily Passive Projects II

Or

How to build a very large scale multifamily  
Passive House building at no extra cost.

Steve Bluestone  
The Bluestone Organization  
[sb@bluestoneorg.com](mailto:sb@bluestoneorg.com)



3<sup>rd</sup> Generation Family

Owned/Operated Business

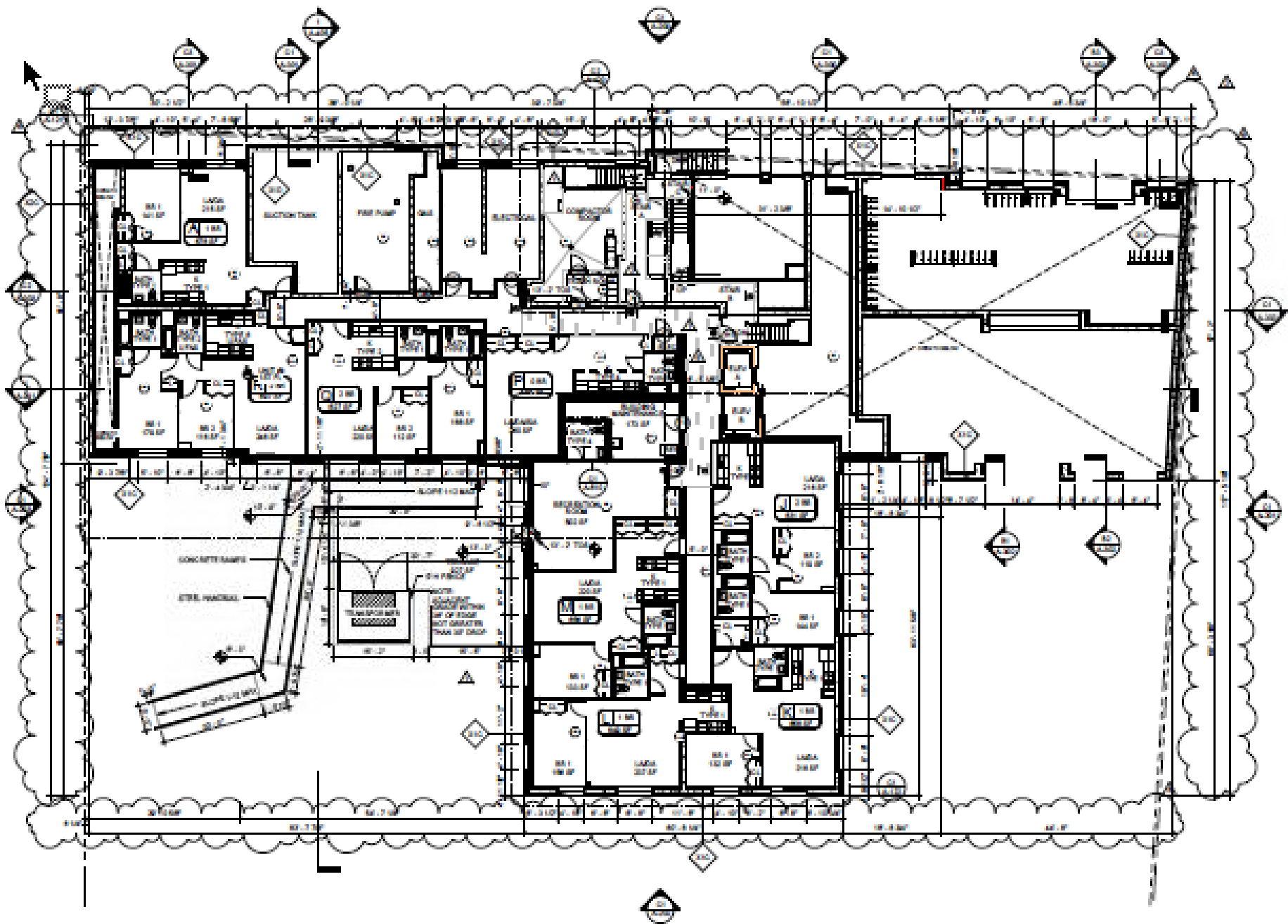
Established 1927

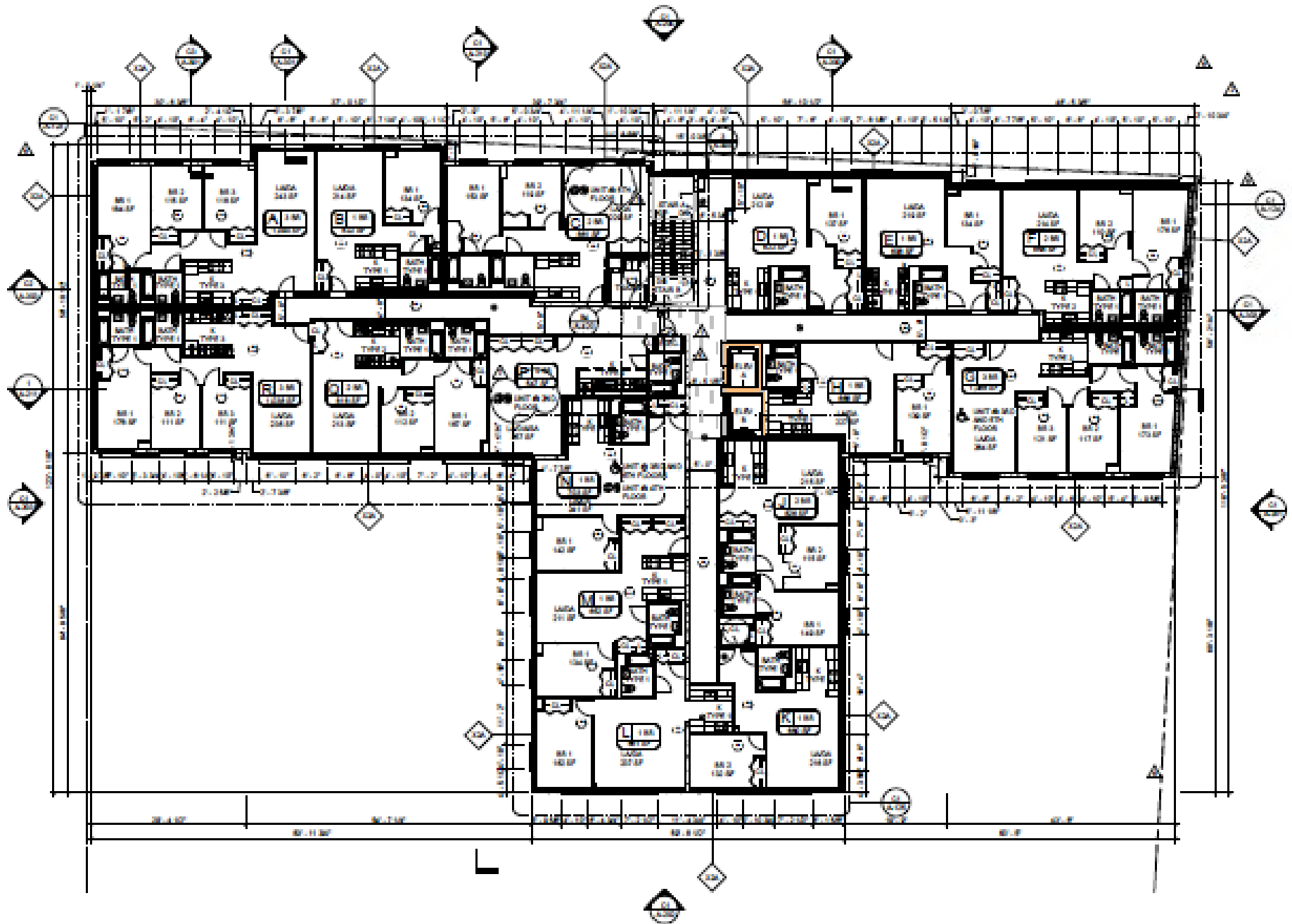
# Beach Green Dunes, Rockaways, NY – 101 unit rental building (formerly known as Beach Green North)

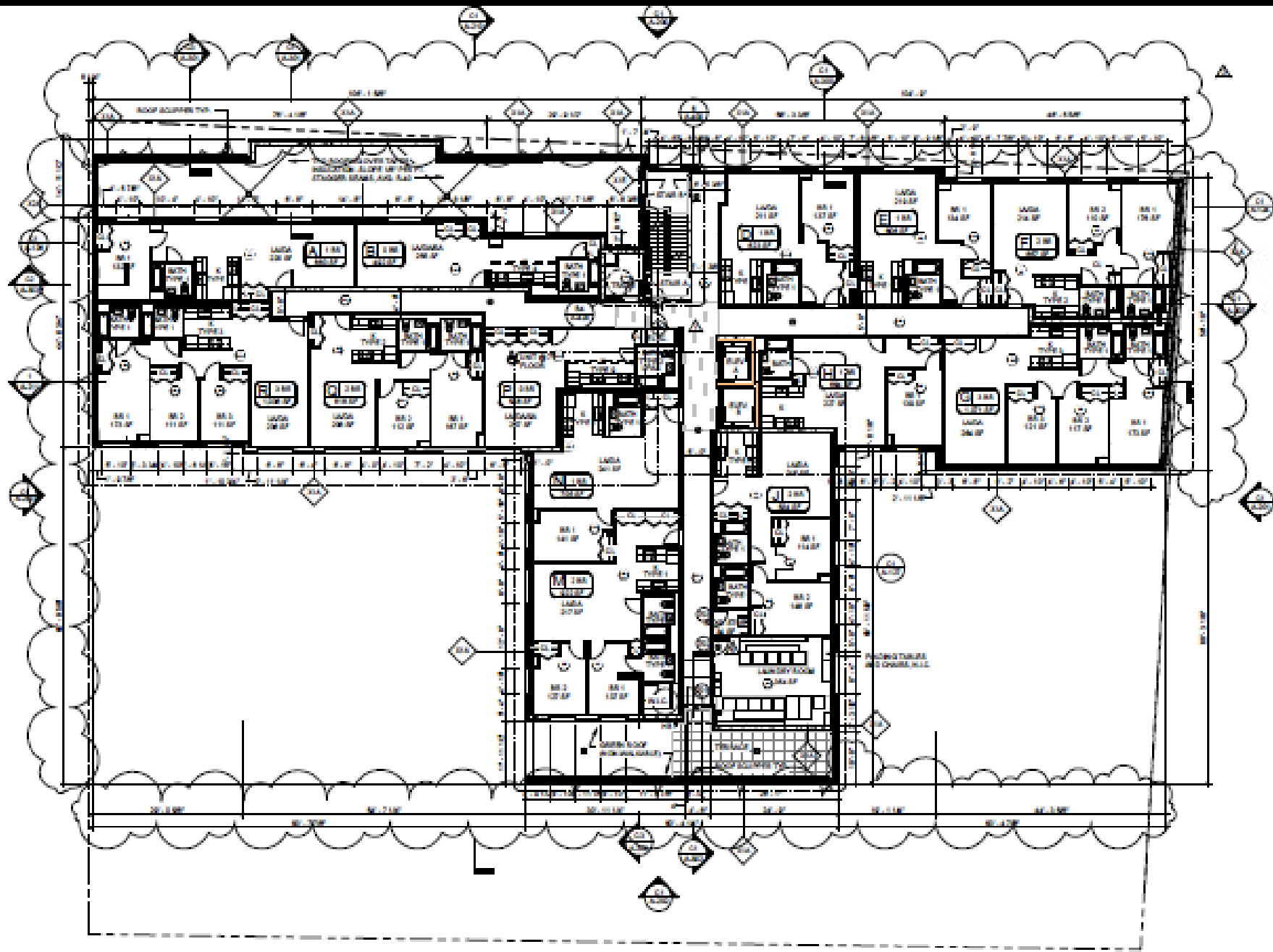


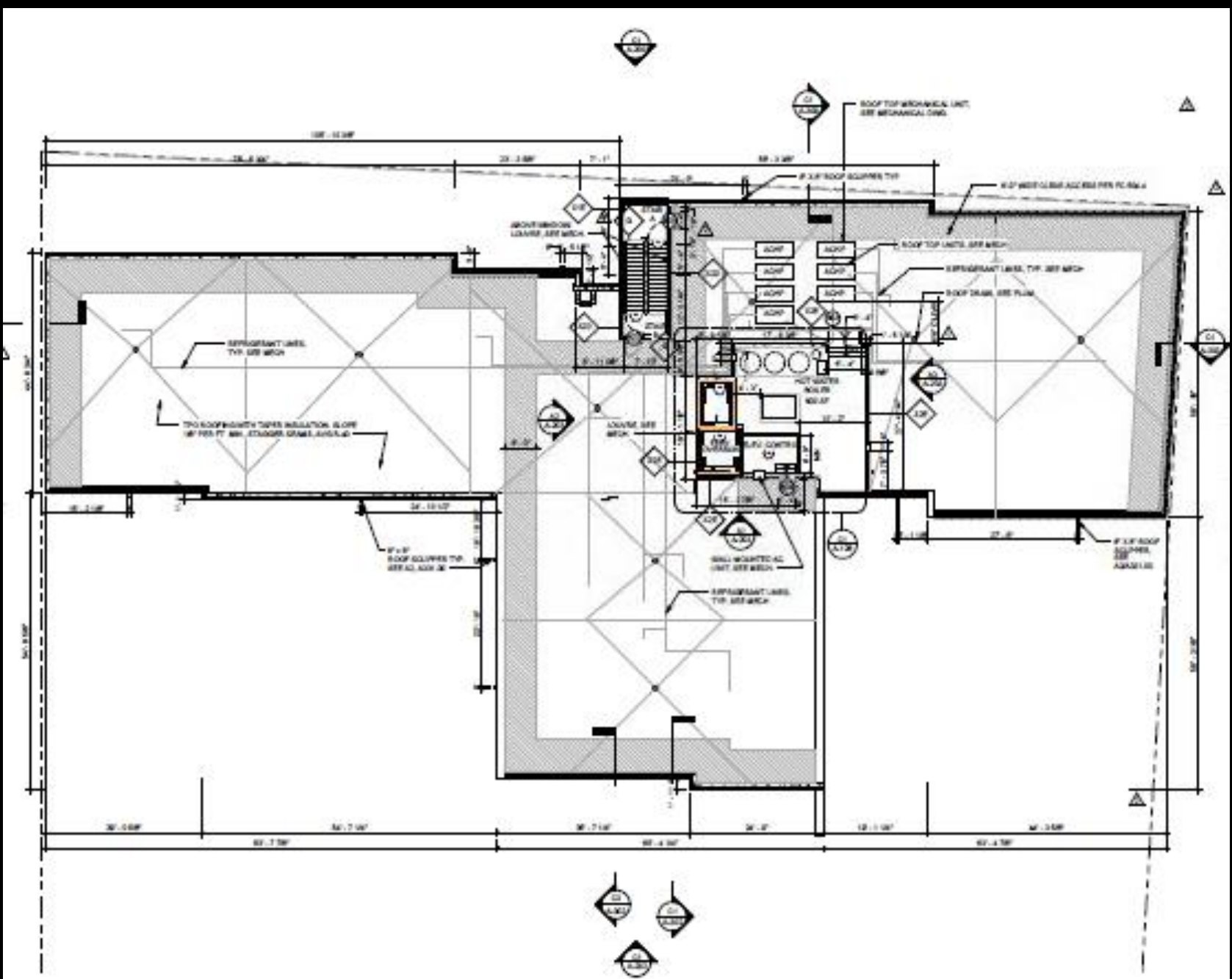










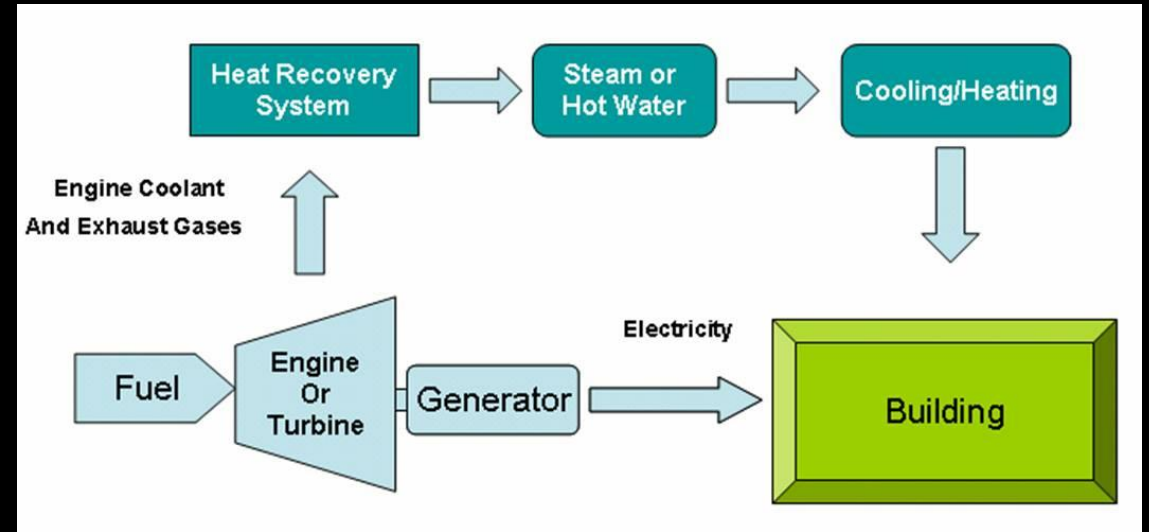




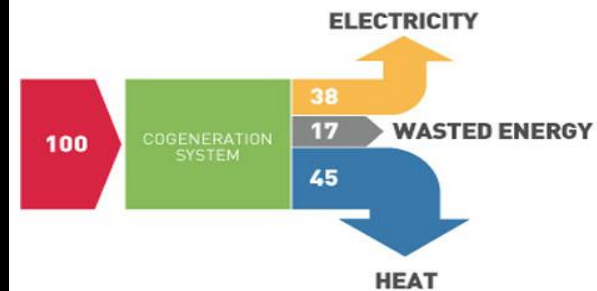
Site energy production



# Natural gas fired CHP (cogen) - 10kw

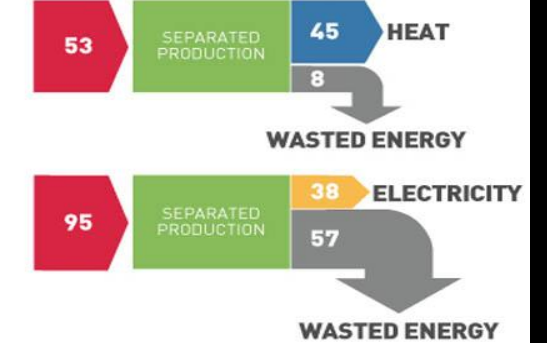


## COGENERATION PRODUCTION



ENERGY INPUT  
100

## SEPARATED PRODUCTION



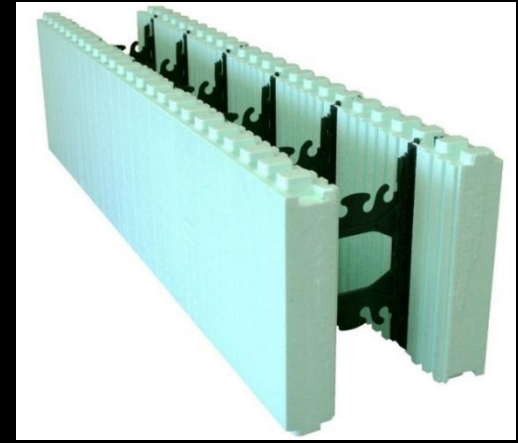
ENERGY INPUT  
 $53+95=148$

Building envelope



## Insulated Concrete Forms (ICFs)

The (almost) perfect wall.



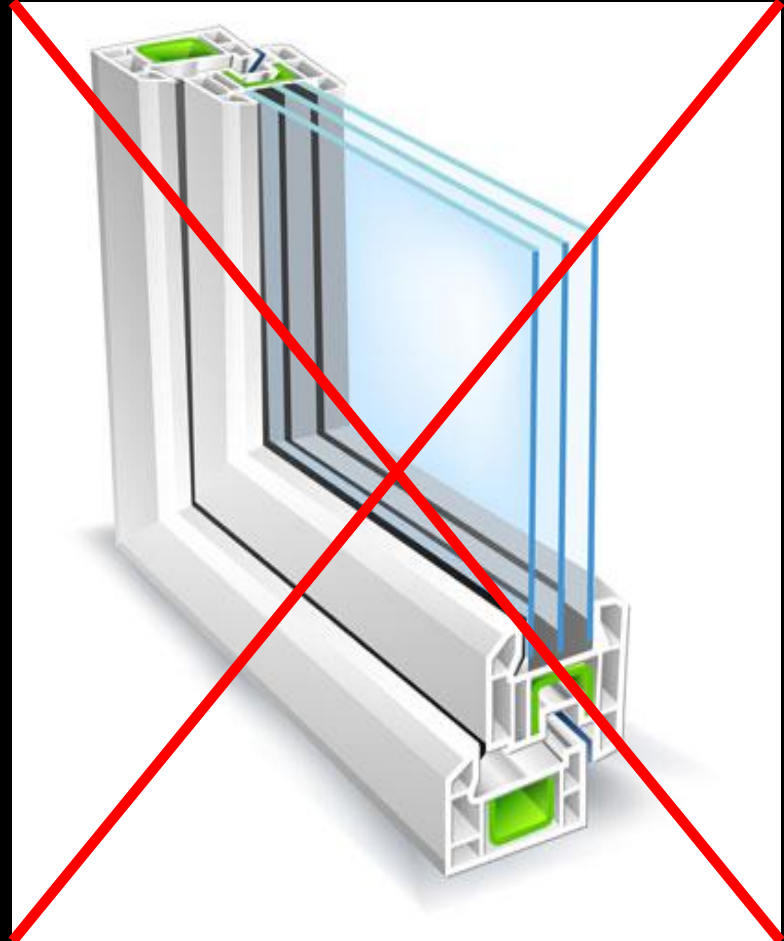


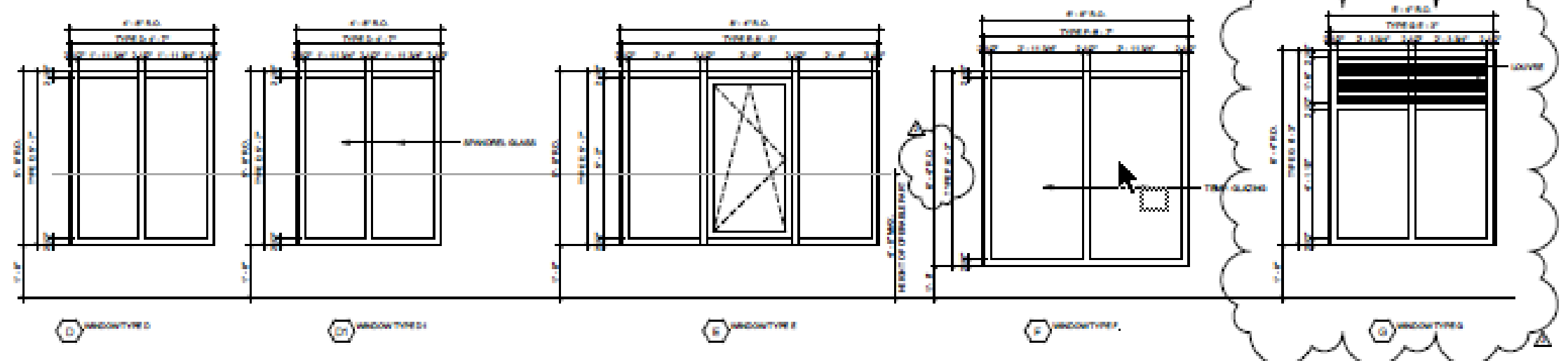
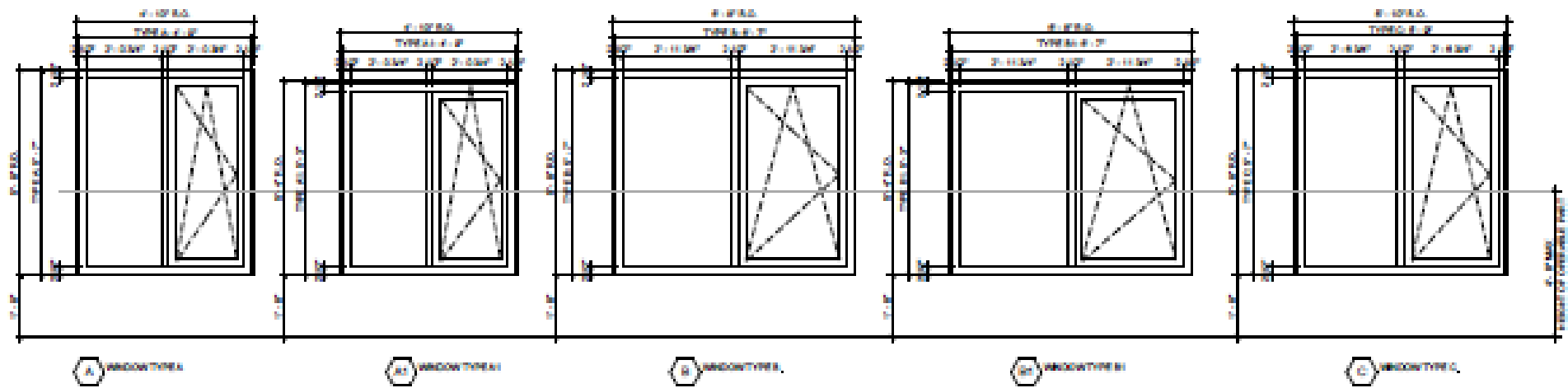
## Insulated Concrete Forms

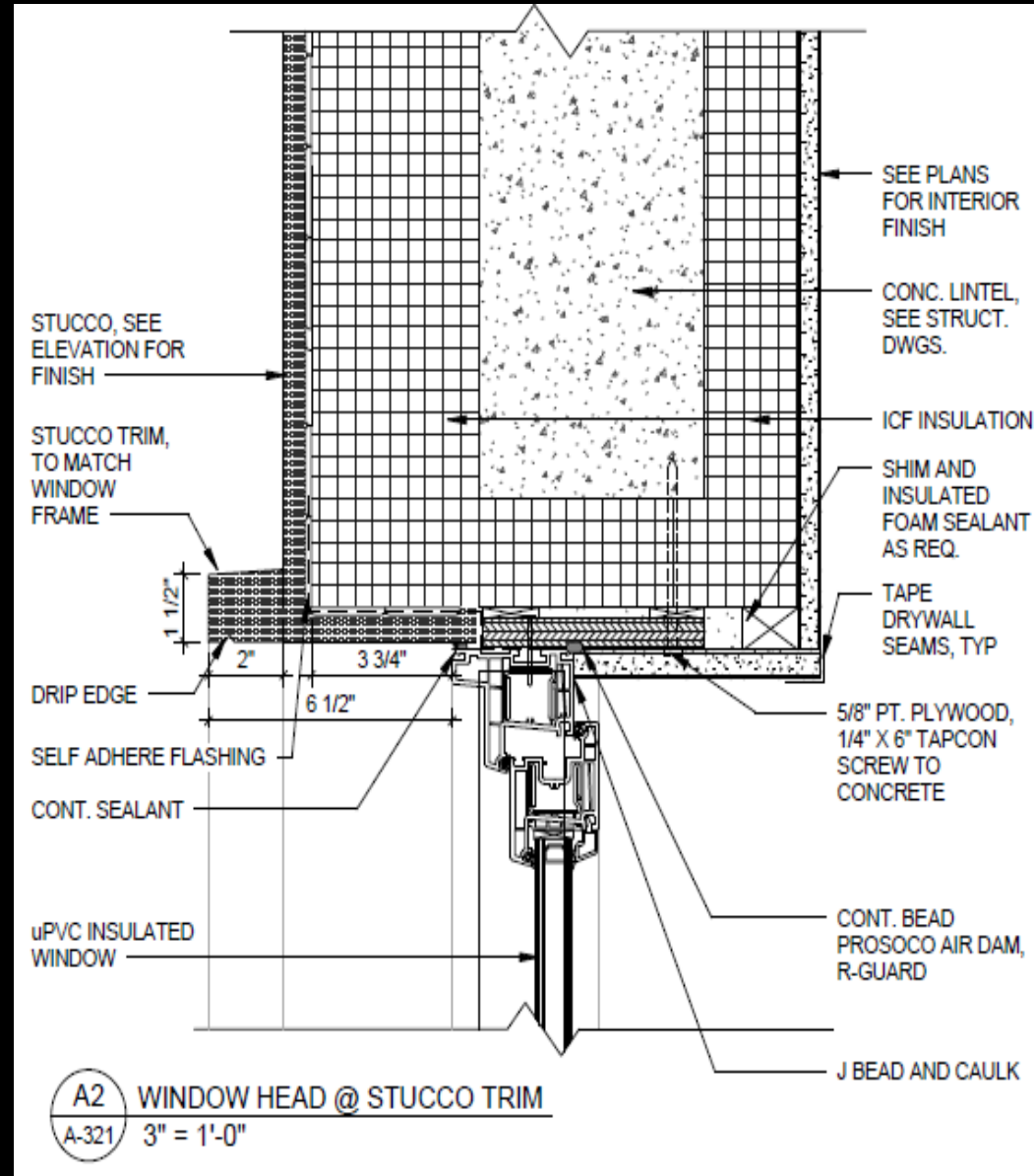
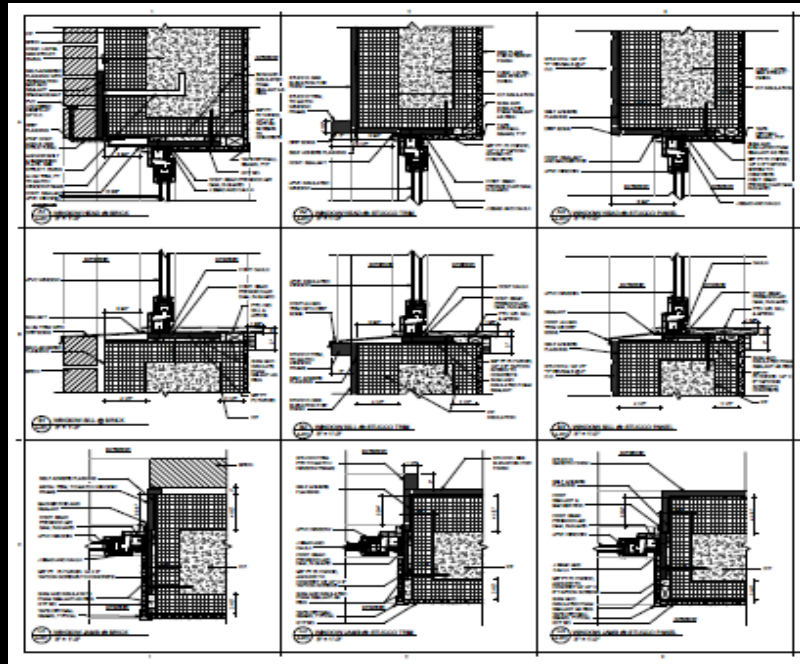
- Installed cost (NYC non-union) = +/- \$18/sf
  - R-value = 24
- Doesn't require water or vapor barriers
- Sound Transmission Coefficient = 55
  - 8" ICF fire rating = 4 hours
    - Built-in furring system
  - Cleaner construction sites
  - Strong, solid concrete walls

## Concrete Blocks

- Installed cost (NYC non-union) = +/- \$22/sf
  - R-value = 1
- Requires added water and vapor barriers
  - Sound Transmission Coefficient = 47
    - 8" hollow block fire rating = 1 hour
      - Requires added studs or furring
  - Increased debris removal costs and violations
  - Requires added grout/rebar to increase strength







**AEROSEAL<sup>®</sup>**  
Duct Sealing From The Inside





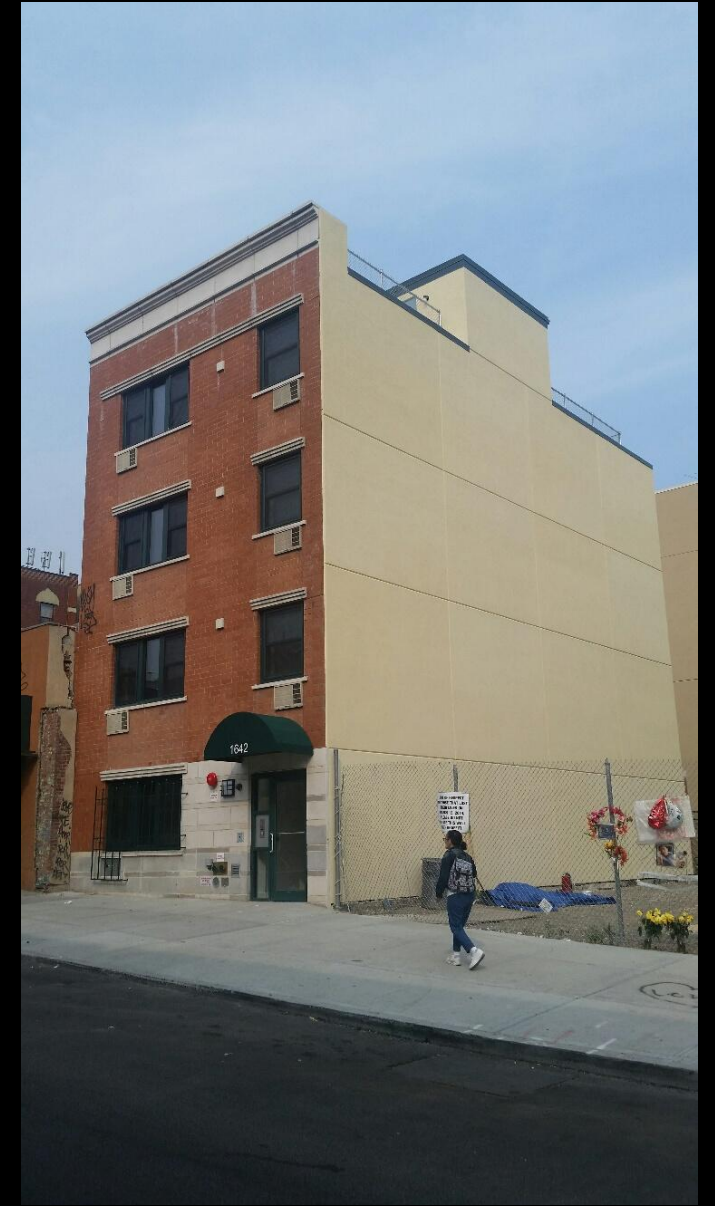
2013



March 12, 2014



Today



HVAC

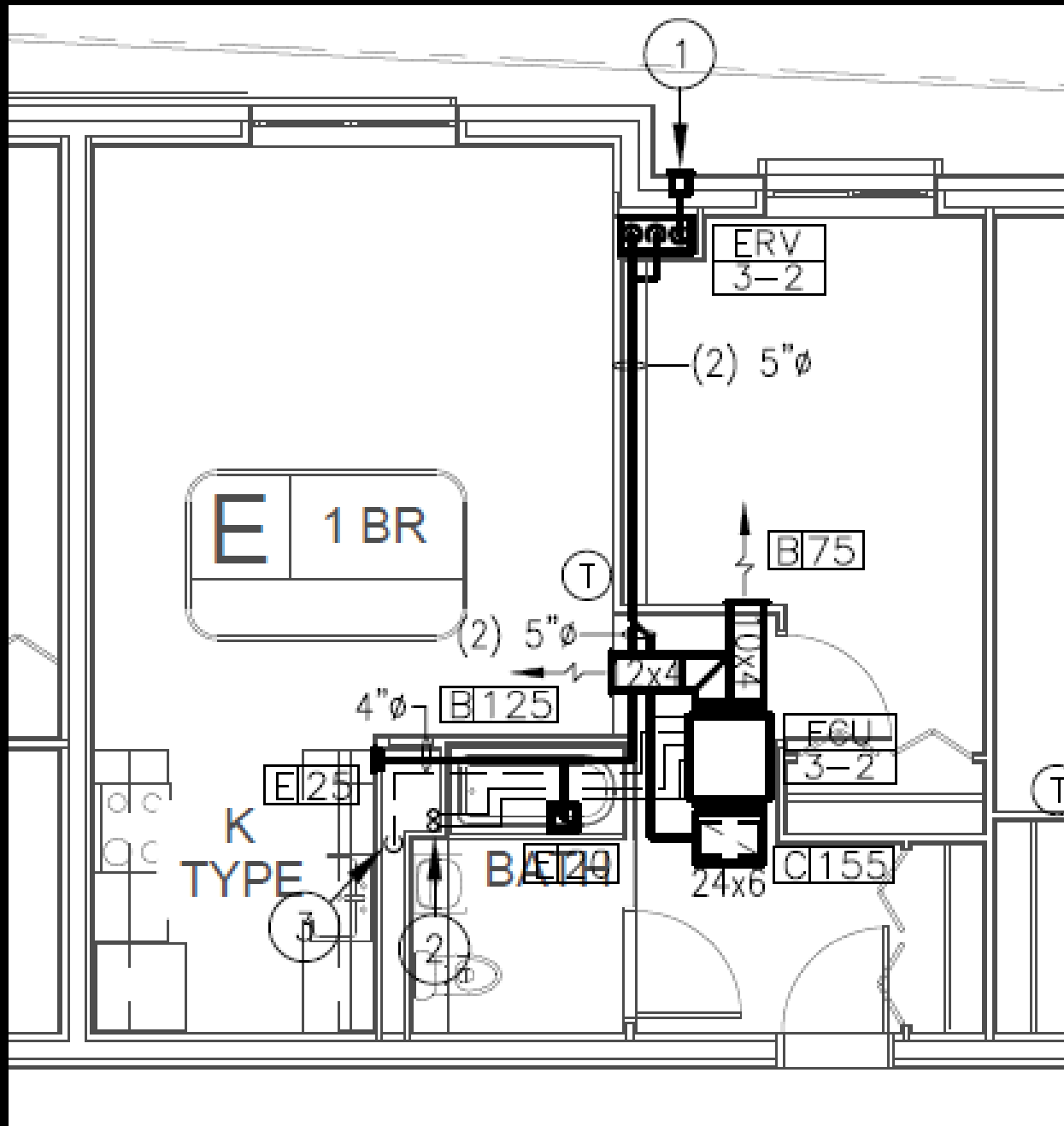
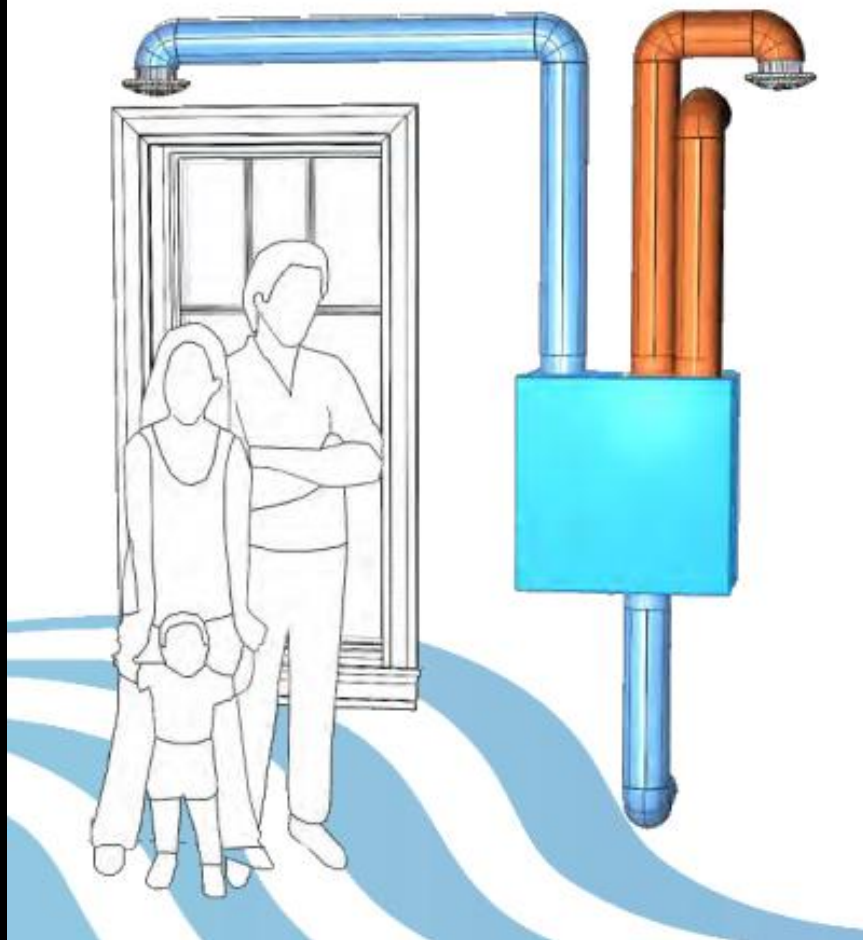


# UltimateAir

Energy Efficient Ventilation

Model ER80M Manual & Installation Guide

Variable 20 - 80 CFM







CCD1: Construction Code Determination Form



Must be typewritten.

1 Location Information Required for all requests on filed applications.

House No(s) 45-05 Street Name ROCKAWAY BEACH BOULEVARD
Borough Queens Block 15853 Lot 48 BIN 4602735 CB No. 414

2 Applicant Information Required for all requests on filed applications.

Last Name LONERGAN First Name Mark Middle Initial Edward
Business Name JOHNSON & URBAN, LLC Business Telephone 732-772-1500
Business Address 295 HIGHWAY 34 Business Fax
City COLTS NECK State NJ Zip 07722 Mobile Telephone
E-Mail MLONERGAN@JOHNSONURBAN.COM License Number 092080
License Type [X] P.E. [ ] R.A. [ ] RLA DOB PENS ID # (if available)

3 Attendee Information Required if different from Applicant in section 2 or no Applicant.

Relationship to the property: [X] Filing Representative [ ] Attorney [ ] Other
Last Name CHOI First Name HACKJONG Middle Initial
Business Name WILLIAM VITACCO ASSOCIATES, LTD Business Telephone 212-791-4578
Business Address 299 BROADWAY, 5TH FLOOR Business Fax
City New York State NY Zip 10007 Mobile Telephone
E-Mail hchoi@vitacco.com License/Registration # (if P.E./R.A./R.L.A./Attorney)
DOB PENS ID # (if available) A11829

4 Nature of Request Required for all requests. Only one request may be submitted per form.

Note: Do not use this form for Zoning Resolution determination requests - use ZRD1 form
Determination request issued to: [X] Borough Commissioner's Office [ ] Technical Affairs
Job associated with this request? [X] Yes (provide job#/doc#/examiner name below) [ ] No
Job Number: 420653377 Document Number: 4 Examiner: MARIA TERESA FERNANDEZ
Has this request been previously denied? [ ] Yes (attach all denied request form(s) and attachment(s)) [X] No
Indicate total number of pages submitted with this request, including attachments: (attachment may not be larger than 11" x 17")
Construction Code (if applicable): [X] 2014 Code [ ] 2008 Code [ ] 1988 Code [ ] Prior to 1988 Code
Indicate relevant code section(s), rule(s), etc.: MC 501.2.1.6.2., BC 1203.1, Appendix F of ASHRAE 62.1 - 2007

Indicate all Buildings Department officials that you have previously reviewed this issue with (if any):
[ ] Borough Commissioner [ ] Code & Zoning Specialist [ ] General Counsel's Office
[ ] Deputy Borough Commissioner [ ] Chief Plan Examiner [ ] Other:

Administrative Use Only section with fields for Reference #, Appointment date, Appointment time, Appointment Scheduled With, Comments, Reviewed By, Date, Time.

REVIEWED BY Scott D. Pavan, RA
APPROVED WITH CONDITIONS
Date: 11/05/2015

12/14

CCD1

5 Description of Request (additional space is available on page 3)

This is a request for:
[X] Interpretation or clarification
[ ] Variation of Building Code or Rules per § 28-103.3 (please state in detail the practical difficulty that is specific to this project, and provide the analysis as to equally safe alternative, as per NYC Charter Section 645(b)(2))
[ ] Variation of Multiple Dwelling Law (MDL) § 277.16 for Article 7B Buildings (please state in detail the practical difficulty that is specific to this project and provide the analysis as to equally safe alternative, as per NYC Charter Section 645(b)(2))
Note: Variations of any other MDL provisions must be filed with the Board of Standards and Appeals (BSA) per MDL § 310.
Please itemize all attachments, including plans/sketches, submitted with this form. If this is based on a plan examiner objection, type in the applicable objection text exactly as it appears on the objection sheet.

A pre-consideration is required for a new building which is a 8 story mixed use. It has a retail (about 500 sq. ft) on the first floor and other spaces are R-2 (UG2) with 101 dwelling units. Fully sprinklered.

45-05 Rockaway Beach Blvd is designed to be a high performance affordable apartment building that will lower energy consumption and be more resilient against storm events. To meet this goal the design project has been designed and is anticipated to meet Passive House Institute US Standards. One of the innovative sustainable system is the use of compartmentalized Energy Recovery Ventilator (ERV), which will intake and exhaust environmental air from each dwelling unit. ERVs reduce energy consumption on the heating and cooling system and provide increased fresh air and comfort level for residents.

Currently, the NYC Mechanical code section 501.2.1.6.2.4 requires occupancy group R-2 to be individually exhausted directly to the outdoors and be ten feet (10'-0") from any outdoor air intake opening. However, section 501.2.1.6.2.1 allows exhaust to be located two feet (2'-0") from any operational window or door serving the same dwelling unit and 501.2.1.6.2.2 allows exhaust to be located three feet (3'-0") from any operational window or door serving an adjoining dwelling unit. An operable windows or door is essentially providing intake air for the dwelling units and is a required form of ventilation for habitable spaces per NYC Building code Section 1203.1. If these low volume exhausts are permitted to be 3'-0" away from operable windows, we believe exhaust to intake should also be permitted at the same distance, to allow for greater energy efficiency and healthier indoor environment.

In addition, the current code standard is written for larger commercial size ERVs which have higher flow rates, more than 5,000 CFM, and require more separation distance to reduce cross contamination. The size of an ERV unit for an apartment building is 90 CFM. The lower flow rate reduces the potential for cross contamination and the separation it requires. The recommended manufactures' minimum separation between the systems' exterior intake and exterior exhaust ports is six feet (6'-0") (based on information from Ultimate Air, Venmar, Lennox, Fantech, and Panasonic).

For this project, the most efficient layout of the intake and exhaust is to have one port below the ceiling and one port above the floor. The floor to floor for this project is nine feet four inches (9'-4"), which would make the distance between intake and exhaust eight feet (8'-0"), less than the required ten feet (10'-0") but is greater than the manufacture recommended distances and the distances required for operable windows.

As this is an affordable housing project, we are looking to provide the most beneficial and cost efficient design. To comply with the current mechanical code, we would need increase the amount of ductwork, which means more air friction and higher energy consumption for the mechanical fans, and increase square footage and material for soffits and ducts.

Note: Buildings Department Determination will be issued on the CCD1 Response Form

Administrative Use Only section with fields for Reviewed By, Date, Time.

REVIEWED BY Scott D. Pavan, RA
APPROVED WITH CONDITIONS
Date: 11/05/2015

12/14

CCD1

6 Description of Request (use this section if additional space is required for description)

It is our interpretation that the proposed ERV exhausts comply with 2014 MC 501.2.1.6.2.1 and 501.2.1.6.2.2
In addition, Appendix F of referenced standard ASHRAE 62.1, 2007 - Ventilation for Acceptable Indoor Air Quality, presents an acceptable alternative method of determining the minimum separation distance for exhaust and outdoor air intakes. Applying the calculations listed in this section, the 8'-0" clearance provided would be in compliance with this method.

Thank you very much for your considerations for this matter.

- Encl.
- project outline with low energy consumption features
- M-101 (please see #1 in key notes and ERVs near windows in the plan)
- M-102 (please see #1 in key notes and ERVs near windows in the plan)

Note: Buildings Department Determination will be issued on the CCD1 Response Form

7 Statements and Signature Required for all requests

I hereby state that all of the above information is correct and complete to the best of my knowledge. Falsification of any statement is a misdemeanor and is punishable by a fine or imprisonment, or both. It is unlawful to give to a City employee, or for a City employee to accept, any benefit, monetary or otherwise, either as a gratuity for properly performing the job or in exchange for special consideration. Violation is punishable by imprisonment or fine, or both.

Name (please print) MARK EDWARD LONERGAN
Signature [Signature] Date 11-15
Professional Engineer Seal: MARK EDWARD LONERGAN, License No. 092080-1

Date: (R.A. Seal (apply 2008 or later sign and date over seal - not required for Attorneys on unfiled applications))

Administrative Use Only section with fields for Reviewed By, Date, Time.

REVIEWED BY Scott D. Pavan, RA
APPROVED WITH CONDITIONS
Date: 11/05/2015

12/14







Water



NOTES:

ELECTRICIAN TO INSTALL  $\frac{1}{2}$ " CONDUIT FROM PUMP ROOM TO ROOF TOP MECHANICAL ROOM, WITH (2 #12 BLACK WIRES, BOTH COLORED BLACK

INSTALL 11 AMTROL WELL-X-TROL EXPANSION TANKS IN ROOFTOP MECHANICAL ROOM.

PRESSURIZE TANKS PRIOR TO CONNECTING ANY PIPES TO TANKS. PIPE CONNECTED TO ONE TANK IS  $\frac{1}{4}$ ", PIPE CONNECTED TO TWO OR MORE TANKS IS  $\frac{3}{8}$ "

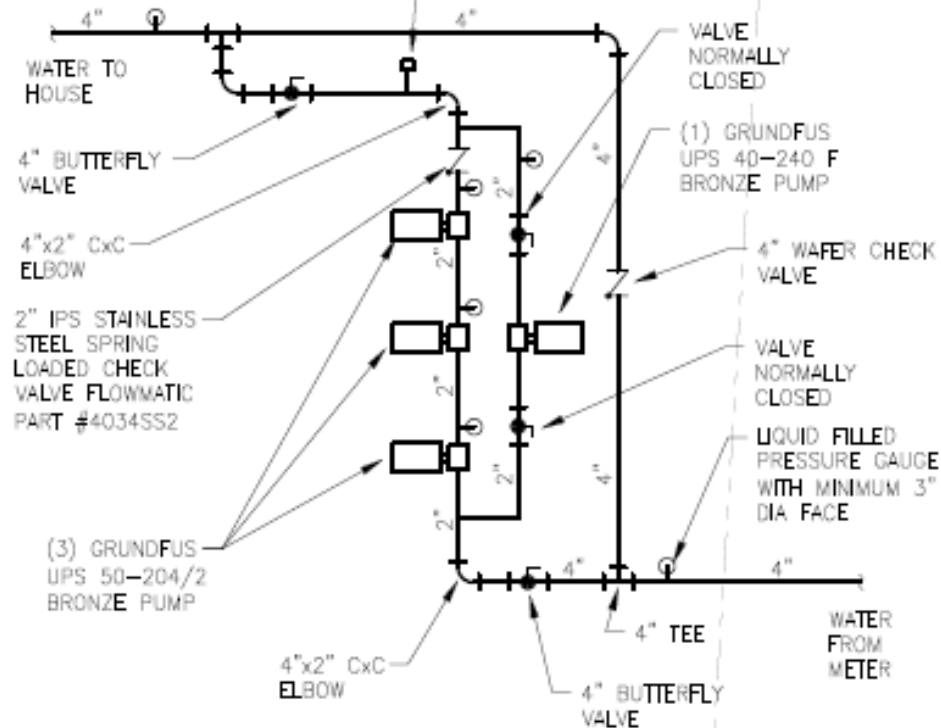
INSTALL KUNKLE POP SAFETY VALVE IN ROOFTOP MECHANICAL ROOM. PART NUMBER #919BFGM06- AMSE VIII. ALLOW NO VALVES BETWEEN POP SAFETY VALVE AND TANKS. MOUNT MINIMUM 48" ABOVE FLOOR, PIPE TO DISCHARGE TO WITH 6" OF FLOOR.

INSTALL (2) HONEYWELL PRESSURE SWITCH MODEL L404F1102 IN-LINE WITHIN 10 FEET OF TANK IN ROOFTOP MECHANICAL ROOM. WIRE TO WIRE TO PUMPS.

INSTALL LIQUID FILLED PRESSURE GAUGE GRAINGER PART #4CFJ8 WITHIN 20" OF HONEYWELL PRESSURE SWITCH ON ROOFTOP MECHANICAL ROOM

ALLOW 18" OF STRAIGHT PIPE BETWEEN PUMPS

HONEYWELL L404B1346 PRESSURE TROL WIRE TO TURN PUMPS OFF IF PRESSURE DROPS BELOW 20 PSI



BOOSTER PUMPS LOCATED IN 1ST FLOOR FIRE PUMP ROOM

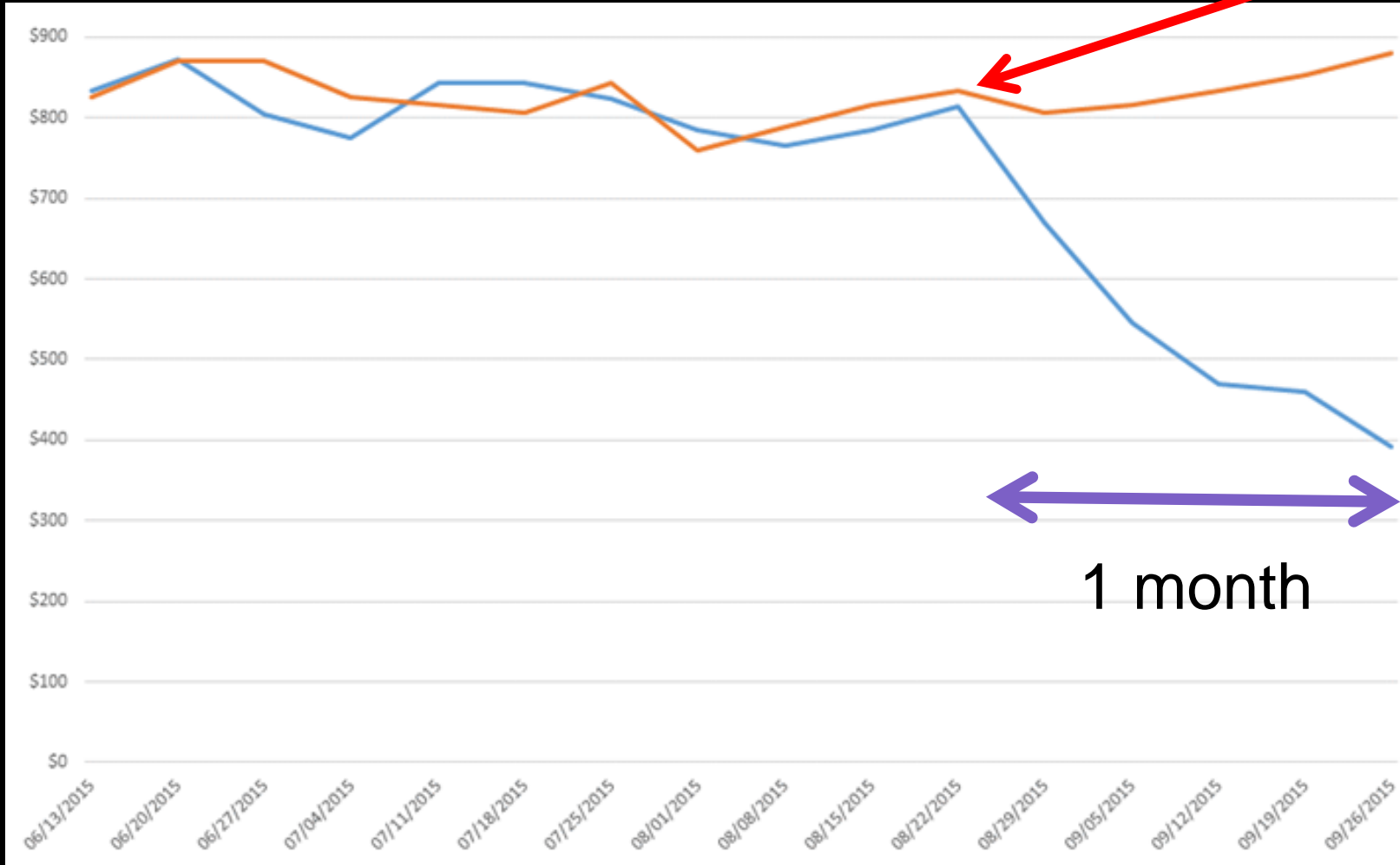




Yellow line – water/sewer cost 2014

Blue line – water/sewer cost 2015

Start of building-wide retrofit of all plumbing fixtures



ROI in less than 8 months.

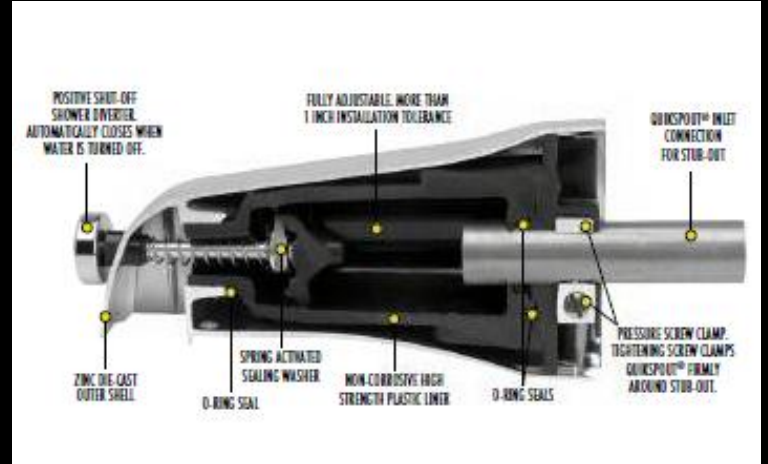
1 month



**Tri-Max Aerator**  
 0.5 / 1.0 / 1.5 GPM  
 (1.8 / 3.8 / 5.7 LPM)

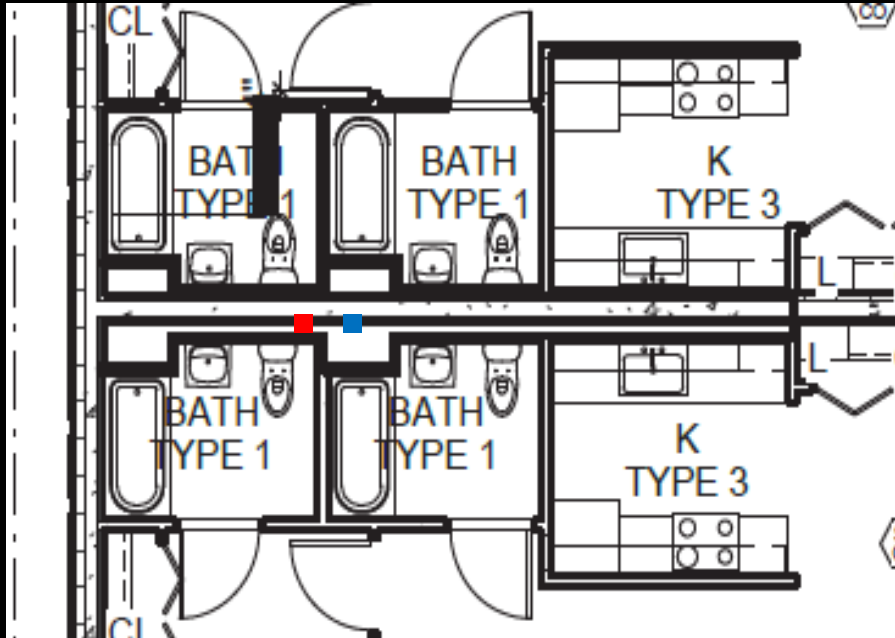
- Three flow rate options
- Patented FlexFlo technology
- Dual-thread connection





- 60% reduction in water/sewer use/costs
- 20% reduction in natural gas costs for heating water
- Equipment lifespan prolonged (boilers, pumps, pipes)
- Reduced demand on water consumption saves resources lowering the need to work to increase supply system capacity
- Reduced sewage waste = fewer CSO's and lessening of pollution of local water bodies

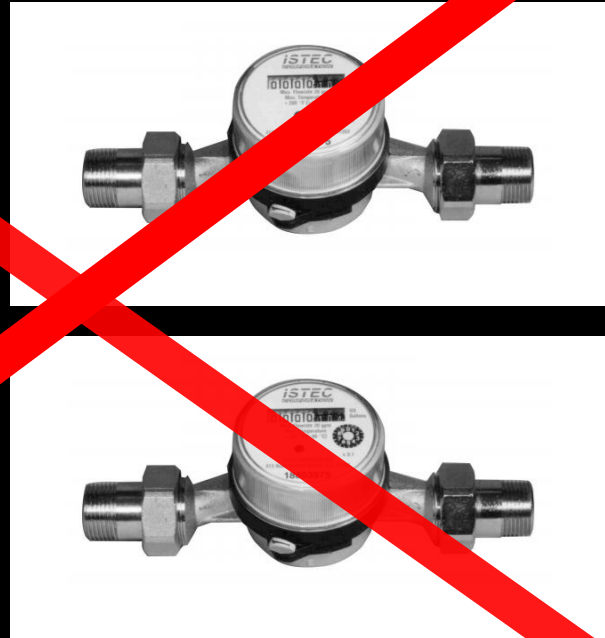
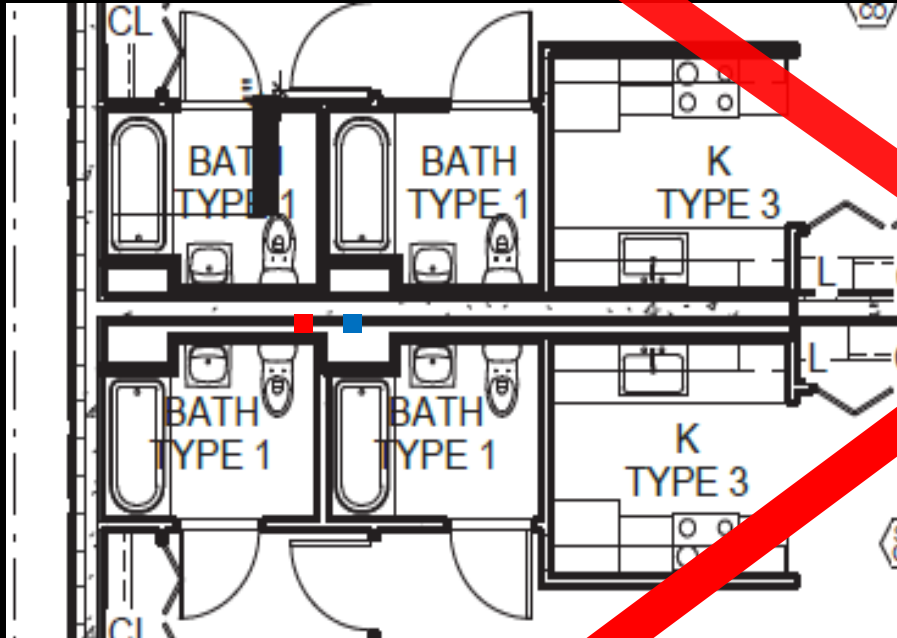
# Install two water sub-meters per apartment



Use of water sub-meters has proven to result in a 25% reduction in water consumption



Install two water sub-meters per apartment



Use of water sub-meters has proven to result in a 25% reduction in water consumption



Jamaica, Queens  
174 rental apartments  
+ 25,000 SF retail/community facility



Fleetwood, NY  
249 rental apartments  
+12,000 SF retail



[sb@bluestoneorg.com](mailto:sb@bluestoneorg.com)

