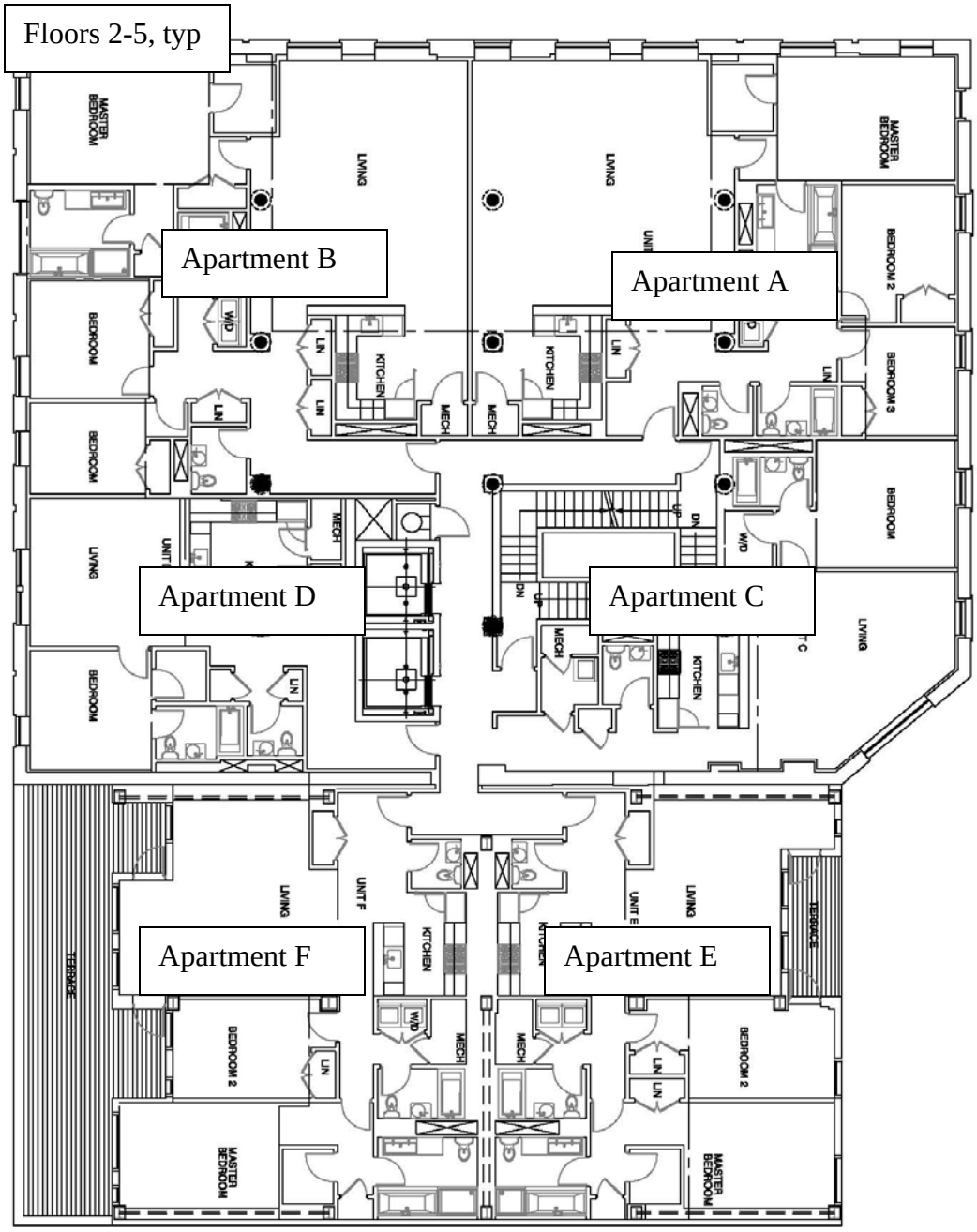
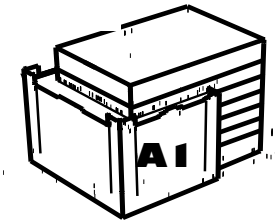
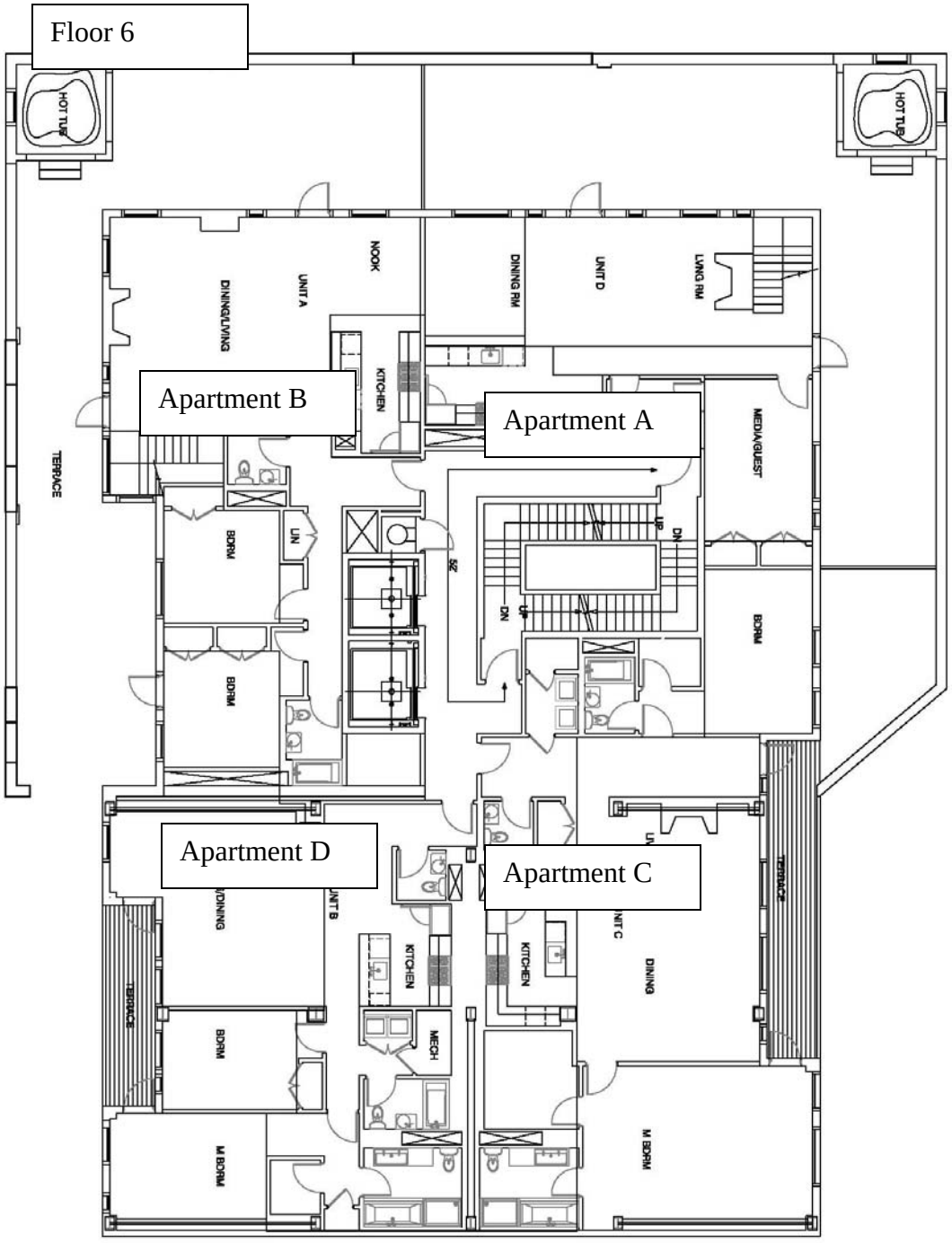
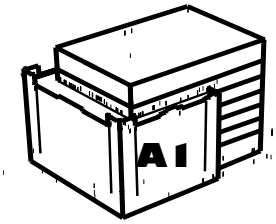
A-1a: Building Plans






Floor 6
HOT TUB
HOT TUB
NOOK
DINING RM
UNIT D
LIVING RM
DINING/LIVING
UNIT A
KITCHEN
Apartment B
Apartment A
MEDIA/GUEST
TERRACE
BDRM
LIN
UP
DN
BDRM
BDRM
Apartment D
Apartment C
TERRACE
UNIT B
KITCHEN
KITCHEN
DINING
TERRACE
BDRM
MECH
M BDRM
M BDRM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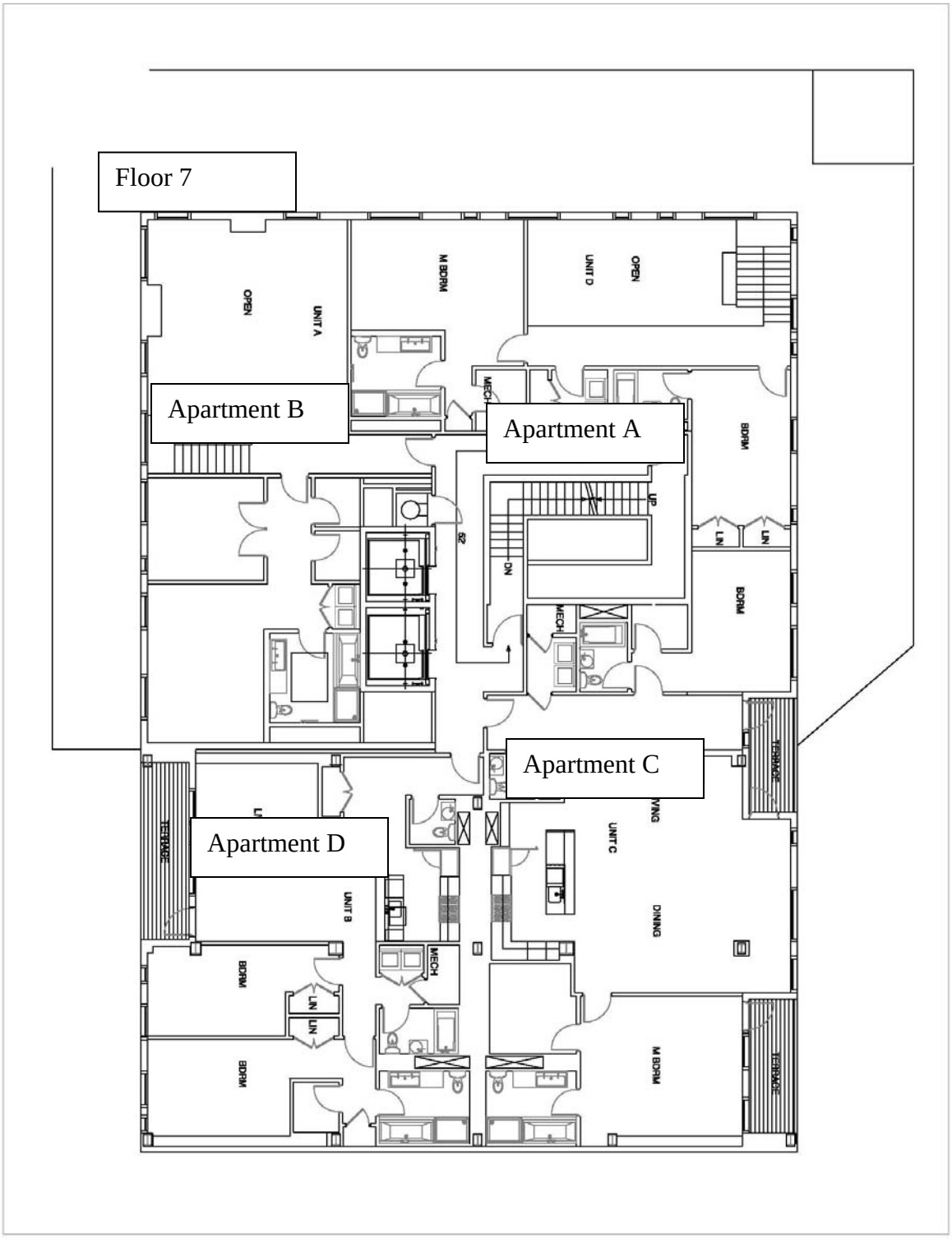
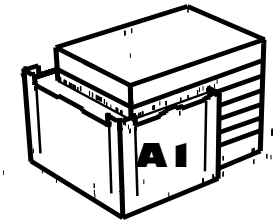

Floor 7
Apartment B
Apartment A
Apartment C
Apartment D
OPEN
UNIT A
M BDRM
UNIT D
OPEN
MECH
BDRM
UP
DN
LIN
LIN
BDRM
MECH
TERRACE
UNIT C
DINING
TERRACE
UNIT B
BDRM
LIN
LIN
MECH
BDRM
M BDRM
TERRACE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A-1b: Geothermal Well Conditions

Geotechnical Report

GEOTECHNICAL LIMITATIONS

Explorations

1. The analyses and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the boring logs.

3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time measurements were made.

Review

4. In the event that any changes in the nature, design or location of the proposed building are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by GZA GeoEnvironmental, Inc (GZA). It is recommended that this firm be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

Construction

5. It is recommended that this firm be retained to provide soil engineering services during construction of the excavation and foundation phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

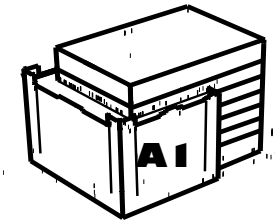
Use of Report

6. This report has been prepared for the exclusive use of **SHoP Architeest** for specific application to the **158 14th Street** located in **Hoboken, NJ**, in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.

7. This soil and foundation engineering report has been prepared for this project by GZA. This report is for design purposes only and is not sufficient to prepare an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.

8. This report may contain comparative cost estimates for the purpose of evaluating alternative foundation schemes. These estimates may also involve approximate quantity evaluations. It should be noted that quantity estimates may not be accurate enough for construction bids. Since GZA has no control over labor and materials cost and design, the estimates of construction costs have been made on the basis of experience. GZA does not guarantee the accuracy of cost estimates as compared to contractor's bids for construction costs.

LIMITGEO.TEC (1/1/91) PAGE 1



The Owner and the Contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our Client. Under no circumstances should the information provided below be interpreted to mean that GZA is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

The Contractor should be aware that slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulations, e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

As an alternative to temporary slopes, vertical excavations can be temporarily shored. The Contractor or the Contractor's specialty subcontractor would be responsible for the design of the temporary shoring in accordance with applicable regulatory requirements but the recommendations of this report will serve as a minimum requirement. Per OSHA requirements, if any excavation is extended to a depth of more than 20 feet, it will be necessary to have the side slopes designed by a Professional Engineer.

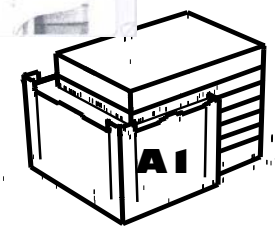
As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance from the crest of slopes equal to no less than the slope height. Exposed slope faces should also be protected against the elements.

6.5 Dewatering, Waterproofing, and Drainage

Based on the subsurface investigation and our observations, groundwater was identified immediately below the existing basement slabs. Given that the anticipated final basement bottom of slab elevation of the East building will be approximately 4.5 feet below the existing level, we estimate that the final excavation depth will be approximately 3 to 5 feet below the current groundwater level and possibly greater at local excavations for footings.

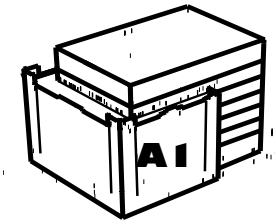
During construction, a temporary pumping system will be required in order to excavate and construct foundations below the groundwater level. The temporary pumping systems should be designed by the Contractor's Professional Engineer to accommodate an estimated excavation depth, as described previously. Pumping may be accomplished from a well point system around the site, or from temporary sump pits within the site. The Contractor should be required to obtain the necessary permits for discharge of water.

It is recommended that foundation walls be waterproofed for the full depth from foundation level to ground surface. For the cellar slab, we recommend that a minimum six inch cushion layer of fine sand be placed over the final subgrade. On top of the cushion and directly under the slab, a waterproofing system, such as Grace Preprufe



Well Layout:

A-1c: LEED Credits



Sections of LEED 2.1, New Construction, that should be addressed primarily by the Mechanical Engineers, and how they are met or not met for Hoboken Residential

WE C3.1, C3.2 – Water use reduction

A 27% decrease in water use is achieved thru low flow toilets, showerheads, lavatories and kitchen sinks. This will accomplish credit C3.1 only.

EA P1 – Fundamental Building Systems Commissioning

The Mechanical specifications call for basic commissioning of building systems

EA P2 – Minimum Energy Performance

Design Documents are to code, and meet ASHRAE 90.1

EA P3 – CFC Reduction in HVAC&R Equipment

The chillers use 407c as the refrigerant, and CFC's are not used in any equipment.

EA C1.2 thru C1.10 – Optimize Energy Performance

It is estimated that the building will use between 15 and 30 percent energy less than ASHRAE 90.1 minimum requirements

EA C2.1thru C2.3 – Renewable Energy

The building will not use renewable energy besides what in the municipal electric mix is renewable

EA C3 – Additional Commissioning

The extent of commissioning specified in this section is not met by the contract documents.

EA C4 – Ozone Depletion

No HCFC's or Halons are used in the mechanical systems of this building. As stated above, 407c refrigerant, an HFC mix, is used in the chillers, and there are no other heat pumps in the mechanical system. The fire suppressant system is a water sprinkler system.

EA C5 – Measurement & Verification

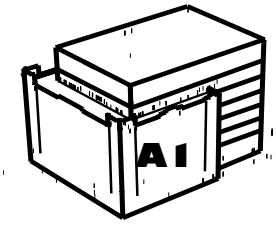
There is no long term verification or metering plan for all the items required for this credit.

EA C6 – Green Power

The municipal power which is used to provide electricity for the building, is less than 50% renewable.

IEQ P1 – Minimum IAQ Performance

The building is to code and meets ASHRAE Standard 62



IEQ P2 – Environmental Tobacco Smoke

Public spaces in this building will be non-smoking.

IEQ C1 – Carbon Dioxide Monitoring

Carbon dioxide monitoring is not designed for any spaces

IEQ C2 – Ventilation Effectiveness

An air change effectiveness of greater than 0.9 for all spaces cannot be assured

IEQ C3.2 – Construction IAQ Management Plan

A building flushout is difficult with the present design; an IAQ test may be specified depending on quantity of points needed to attain a silver rating at that time.

IEQ C5 – Indoor Chemical & Pollutant Source Control

Chemical use will exist only in housekeeping areas, and that space is not designed as part of these contract documents. Architect specifies entryway grilles.

IEQ C6.1- Controllability of Systems, Perimeter

Since condominiums have full lighting control and operable windows, it is assumed that this credit will be met when the supporting calculations are done.

IEQ C6.2 - Controllability of Systems, Non-Perimeter

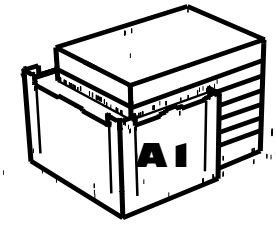
It is assumed each apartment has more than two occupants, but there is one HVAC control for each apartment, so this requirement that 50% of the occupants have individual control is not met.

IEQ C7.1 – Thermal Comfort, ASHRAE 55-1992

Residential thermal conditions are determined by occupants, so it can not be shown that spaces will comply with ASHRAE 55-1992

IEQ C7.2 – Thermal Comfort, Permanent Monitoring System

There is no permanent monitoring system for the condominium AC

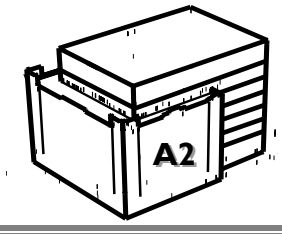


A-2 Energy Model Room Condition Characteristics

Space Characteristics

Winter:
70 F DB
50% RH (if humidified)

Summer:
75 F DB
50% RH



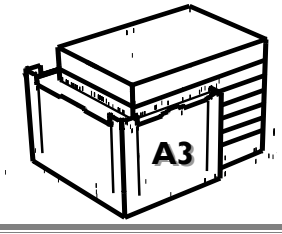
A-3 Envelope Characteristics:

Envelope Values

	90.1 Requirements and Base Case		Design Values	
	Assembly Maximum U Value	Insulation Minimum R Value	Assembly U Value	
Roof (Insulation Entirely Above Deck)	0.063	15 ci	0.051	
Walls (Steel Frame)	0.064	13+7.5ci	0.046	
Walls (Other)	0.089	13	0.059	
	Assembly Maximum U Value	SHGC	Assembly Maximum U Value	SHGC
Glazing, Operable, 10-20% of Wall	0.67	0.39	0.31	0.31

Conditioned Areas

New Wall	10100 sf
Existing Wall	25200 sf
Roof	4300 sf
On Grade	7200 sf
Window Area	6920 sf
Interior Floor Area	44000 sf
Average Ceiling Height	10’



Hot Water Heating Demand Profile

Peak, 0.55 kW

Hour	Percent Full Load
1	18%
2	18%
3	18%
4	18%
5	36%
6	45%
7	73%
8	100%
9	91%
10	82%
11	73%
12	69%
13	55%
14	55%
15	55%
16	51%
17	56%
18	64%
19	76%
20	91%
21	73%
22	69%
23	36%
24	18%

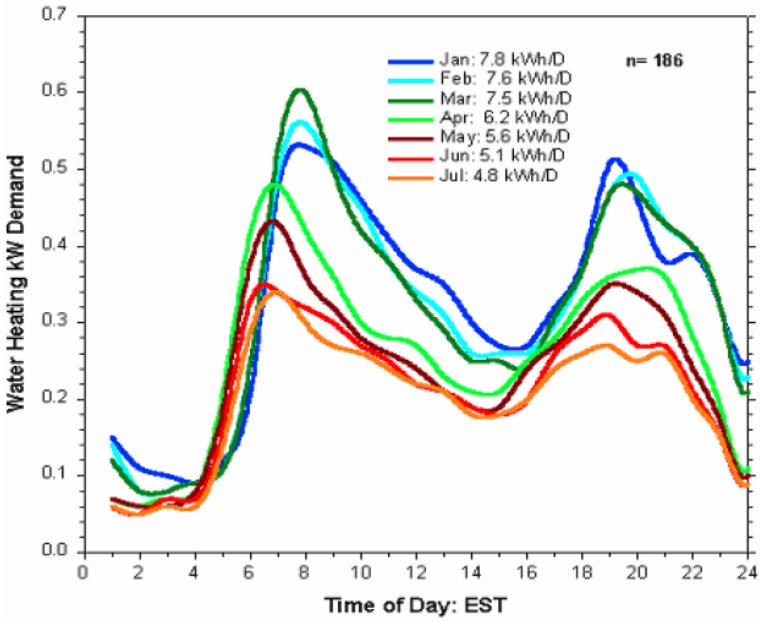
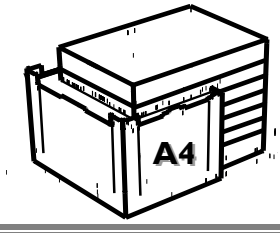


Figure 16. Measured DHW load profiles by month.

Florida Solar Energy Center Large Scale Residential Hot Water Use Study

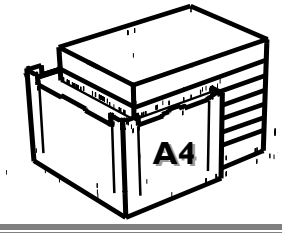


Pump Electricity Demand Profile*, Inserted into TRACE

	Dec-Feb	March-May	June-August	Sept-Nov
1	0.13	0.00	0.13	0.00
2	0.13	0.00	0.13	0.00
3	0.13	0.00	0.13	0.00
4	0.13	0.00	0.13	0.00
5	0.13	0.00	0.13	0.00
6	0.13	0.00	0.63	0.00
7	0.13	0.25	0.63	0.25
8	0.13	0.25	0.63	0.25
9	0.13	0.25	0.63	0.25
10	0.13	0.25	1.00	0.25
11	0.13	0.50	1.00	0.50
12	0.13	0.50	1.00	0.50
13	0.13	0.50	1.00	0.50
14	0.13	0.50	1.00	0.50
15	0.13	0.50	1.00	0.50
16	0.13	0.50	1.00	0.50
17	0.13	0.50	1.00	0.50
18	0.13	0.25	1.00	0.25
19	0.13	0.25	0.75	0.25
20	0.13	0.25	0.75	0.25
21	0.13	0.00	0.75	0.00
22	0.13	0.00	0.75	0.00
23	0.13	0.00	0.50	0.00
24	0.13	0.00	0.25	0.00

	kwh	Peak kW
central	64951	24.23132
decentral	97412	36.34156

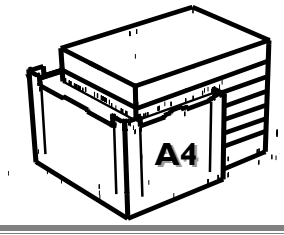
*See C-1 for ground water pump calculations



Lighting Profile
Peak, 1.5 W/sf

Start time	End time	Percentage
Midnight	6 a.m.	10
6 a.m.	7 a.m.	50
7 a.m.	9 a.m.	100
9 a.m.	5 p.m.	70
5 p.m.	11 p.m.	80
11 p.m.	Midnight	50

TRACE Lighting Profile

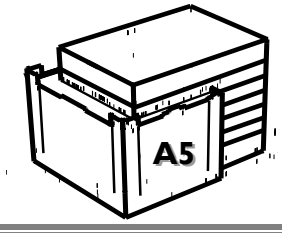


A-5 Airflows and Airflow Conditions

Required quantities refer to ASHRAE Standard 62.1

Exhaust	Bathrooms			Laundry Rooms			Kitchens			Trash Closets		
Exhaust & Supply (Continuous)	Quantity	Required Exhaust	Actual Exhaust	Quantity	Required Exhaust	Actual Exhaust	Quantity	Required Exhaust	Actual Exhaust	Quantity	Required Exhaust	Actual Exhaust
Floors 2-5										1	10	50
Unit A	3	60	225	1	-	120	1	25	100			
Unit B	3	60	225	1	-	120	1	25	100			
Unit C	2	40	150	1	-	120	1	25	100			
Unit D	2	40	150	1	-	120	1	25	100			
Unit E	3	60	225	1	-	120	1	25	100			
Unit F	3	60	225	1	-	120	1	25	100			
Floor 6										1	10	50
Duplex A	1	20	75	0	-	0	1	25	100			
Duplex B	2	40	150	0	-	0	1	25	100			
Unit C	3	60	225	1	-	120	1	25	100			
Unit D	3	60	225	1	-	120	1	25	100			
Floor 7										1	10	50
Duplex A	2	40	150	1	-	120	0	0	0			
Duplex B	1	20	75	1	-	120	0	0	0			
Unit C	3	60	225	1	-	120	1	25	100			
Unit D	3	60	225	1	-	120	1	25	100			
Basement										3	100	150

OA Supply Quantities					
Exhaust & Supply (Continuous)	People CFM /	Required OA	Required Supply	Actual Total Exhaust	Actual OA Supply
Floors 2-5					
Unit A	5	15	75	445	445
Unit B	5	15	75	445	445
Unit C	3	15	45	370	370
Unit D	3	15	45	370	370
Unit E	5	15	75	445	445
Unit F	5	15	75	445	445
Floor 6					
Duplex A	5	15	75	175	245
Duplex B	5	15	75	250	245
Unit C	4	15	60	445	445
Unit D	4	15	60	445	445
Floor 7					
Duplex A	5	15	75	270	200
Duplex B	5	15	75	195	200
Unit C	4	15	60	445	445
Unit D	4	15	60	445	445
Shared Hallways			0		960



Airflow Summary

Reclaimable exhaust by code (bathrooms and trash)	6,600
Non reclaimable by code (kitchen hood, dryer)	6,600
Total Building Exhaust	13,200
Hallway Supply and Pressurization	1,960
Total Apartment Supply	12,750

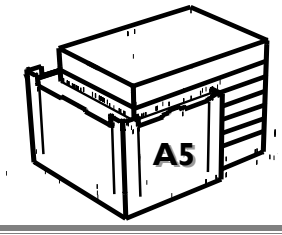
Other Airflows

Infiltration
0.15 Air changes per hour

Supply Temperatures

Rooftop AHU
Heating: 70 F
Cooling: 75 F

Supply Units
Cooling: 56 F
Heating: Dependent on System



A-6 Other Mechanical Constants

Geothermal System Condenser loop temperature:
Maintained between 50 and 60 deg year round

Fans
All fans (roof top, geothermal unit, fan coil units) are run at 0.5 in wg of static pressure

Pumps:
Building Circulation pumps (Chilled water, hot water) are run at 100 ft of head
Ground source pumps are run at 160 ft of head
Domestic Heat Pump Condenser loop pumps (which runs through the whole building) is run at 100 ft of head
Central Heat Pump Condenser loop (which runs from the HX to the HP's in the basement) is run at 30 feet of head

Refrigerant:
All heat pumps are selected for R-22 to maintain LEED CFC rating.

Circulating Water Temperatures:
Chillers and Water to Water HP: 44 Deg F
Boiler: 180 Deg F
Water to Water Heating: 110 Deg F